ESPID-0115

CHARACTERISING THE BURDEN OF INVASIVE PSEUDOMONAS INFECTION ON NEONATAL UNITS IN THE UK BETWEEN 2005-2011

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Introduction**:** Recent concern about severe and life-threatening *Pseudomonas* infections in neonatal intensive care units (NICUs) has largely centred on investigation of outbreaks and identification of nosocomial sources. The clinical course and outcomes of invasive *Pseudomonas* infection remain poorly described in neonates.
Aims: Define and describe the clinical burden of invasive neonatal Pseudomonas infection on NICUs within a neonatal infection surveillance network.

Methods: We analysed cases of invasive *Pseudomonas* infections in 18 UK NICUs participating in the Neonatal Infection Surveillance Network (neonIN) from January 2005 - December 2011. Supplementary clinical data were collected retrospectively.

Results: 42 cases of invasive *Pseudomonas* infection were reported from 12 NICUs. 67% were female, median gestational age was 26 weeks (range: 22 to 40 weeks) and median birth weight 840g (range: 490g to 3712 g; 28 (77%) <1500g). Only 3 (7%) cases were early in onset (<48 hours), the vast majority (35/42; 93%) were late-onset, occurring at median postnatal age of 14 d (range 2 –262 d). Two had meningitis (10% of those having an LP obtained). 12 babies (32%) were known to be colonised with *Pseudomonas* before the onset of their invasive disease episode. Fifteen babies died (38%); 7 deaths were attributed to the infection episode,(18%).

Conclusion: Active surveillance among a network of UK NICUs indicates that *Pseudomonas* infections are typically sporadic. While the overall incidence is low the case fatality rate is high. Researching opportunities for prevention, such as routine screening, should be prioritised.

ESPID-0117

ANTIBIOTIC RESISTANCE AND PRESCRIBING IN EUROPEAN CHILDREN (ARPEC)

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Introduction: ESPID initiated “Antibiotic Resistance and Prescribing in European Children”(ARPEC) to improve quality of antibiotic prescribtion.

Objective: Develop a standard surveillance of data collection and Bahrain was part of it.

AIM

To determine the variation in drug, dose and indications of antibiotic in children

Methods: Data collection was performed using paper form for all existing pediatric and neonatal wards (medical, surgical, PICU, NICU) in a single day

Results

Penicillin in the medical pediatric wards in the Europe was the highest and equivalent in Europe and Bahrain in the general wards.

In PICU, majority of the patients in Bahrain were on Penicillin (30%), whereas, in Europe they were other B-lactams (31%). 100% of treatment was empirically in Bahrain . In Europe, 24% had targeted treatment.

In sepsis, the most antibiotic was Cefotaxime in both. As surgical prophylaxis, duration was one day mostly in Bahrain. In Europe, duration exceeded in most patients. Most common drug for that were B-lactams and Penicillin in both Centers.

In NICU, Gentamicin was the most used drug in the Europe (23%), whereas in Bahrain Meropenem was the highest (24%).

Conclusion: Most of the pediatric patients in Bahrain received surgical prophylaxis for one day in alignment with international guidelines .We have To limit the use of broad spectrum antibiotics. This helped in giving a quick broad idea of the practice of antibiotic in Bahrain plus the other regions who participated in the multicenter study. That helped in improving the quality of services provided to pediatric/ neonatal patients.

ESPID-0118

SUGGESTED GUIDELINES FOR THE DIAGNOSIS AND MANAGEMENT OF CHRONIC HCV INFECTION IN CHILDREN

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HCV infection in children is different from the adults in many ways. Antiviral therapy for chronic hepatitis C has traditionally been considered contraindicated in children. A review of the recent literature however suggests that this view is no more valid. Many recent studies have suggested that antiviral therapy can be safely given in children with excellent results, though some important diagnostic and therapeutic considerations need to be addressed. Diagnostic work-up of children suspected of having chronic HCV should proceed similar to that of adults. Liver biopsy may be considered in HCV-positive children with persistently normal aminotransferase levels. Because of the potential interferon-induced neurotoxicity, antiviral therapy is contraindicated in children <3 years of age. Infected children aged 3-17 who are selected for treatment may receive combination therapy of pegylated interferon & ribavirin. Non-pegylated interferon yields inferior therapeutic response in terms of ETR & SVR rates achieved. In non-responding patients or relapsers, peginterferon-ribavirin combination therapy may be prescribed regardless of the genotype provided the same was not given beforehand. Cirrhotic patients with a CTP score ≤ 9 and a decompensated event that abated with standard treatment may be considered for antiviral therapy, although more data in pediatric age group is needed to recommend routine usage of this therapy. Despite the promising results in adults, the use of haematopoietic growth factors (erythropoietin & filgrastim) as adjuncts in the management of HVC infection in children is not recommended at this moment.

Table 1: Definitions of Treatment Responses:

Rapid virologic response (RVR)	Qualitative HCV RNA assay done at 4 week comes out to be negative (<50IU/mL)
Early virologic response (EVR)	Quantitative HCV RNA assay done at 12 weeks: ▪Comes out to be negative – called early virologic clearance (EVC) or aviremic response ▪Shows a decline in the HCV RNA titre (compared with the pre-treatment assay) of ≥ 2 log – called partial virologic response (PVR) or viremic response
Nonresponders	Quantitative HCV RNA assay done at 12 weeks showing either no decline in the HCV RNA titre (compared with the pre-treatment assay) or a decline of < 2 log
End of treatment response (ETR)	Qualitative HCV RNA assay done on completion of the recommended duration of the course comes out to be negative
Sustained virologic response (SVR)*	Qualitative HCV RNA assay done 24 weeks after completion of the recommended duration of the course comes out to be negative
Relapsers	Qualitative HCV RNA assay done on completion of the recommended duration of the course came negative, but 24 weeks later, the assay done to confirm SVR comes out to be positive.

*Achievement of SVR is generally considered as the marker of eradication of HCV infection. Almost all such patients show EVC or PVR on 12 weeks assay.

Table 2: Suggested Management Plan in Children with Genotypes 2&3:	
HCV RNA Assay:	Recommendation as per the HCV RNA Assay result:
Week 4 qualitative HCV RNA assay*:	
Negative assay (<50IU/mL) i.e. a case of RVR	Institute a standard treatment course of 24 weeks. Although, a few studies have shown attainment of comparable SVR rates in this subgroup with shortened treatment courses of 12-16, more data is needed to validate this recommendation in pediatric age group.
Positive assay	Give treatment for the standard duration of 24 weeks† (may be 36-48 weeks)
Week 24 qualitative HCV RNA assay:	
Negative assay i.e. a case of ETR	Successful therapy. Needs a repeat qualitative HCV RNA assay at week 48 (24 weeks after ETR) to establish SVR
Positive assay	Treatment failed
Week 48 qualitative HCV RNA assay:	
Negative assay i.e. a case of SVR	HCV infection got eradicated

*The newly recommended week 4 qualitative HCV RNA assay helps modify the duration of the therapy based on viral kinetics. On one hand, this approach helps maximize the SVR rates and on the other hand, limits the toxicities and cost associated with the extended treatment courses. Achievement of RVR means that we can consider shortening the treatment course.
†SVR rates achieved in this subgroup are relatively poor. Thus prolonged therapy (>24 weeks) may be considered in this subgroup, although more evidence is needed at this time for a definite recommendation.

Table 3: Suggested Management Plan in Children with Genotypes 1:	
HCV RNA Assay:	Recommendations as per the PCR results:
Week 4 qualitative HCV RNA assay:	
Negative assay (<50IU/mL) i.e. a case of RVR	**Predictors of poor response absent:** •Shorten the treatment duration to a total of 24 weeks **Predictors of poor response present:** •Give treatment for the standard duration of 48 weeks
Positive assay	Continue treatment and repeat HCV RNA at 12 weeks
Week 12 qualitative HCV RNA assay:	
Negative assay i.e. a case of EVC	Continue treatment for a total of 48 weeks
HCV RNA fall by ≥ 2 logs i.e. a case of PVR	Repeat qualitative HCV RNA at 24 weeks.
HCV RNA fall by < 2 logs i.e. a case of non-responder	Stop treatment
Week 24 qualitative HCV RNA assay (only done in cases which show PVR at week 12 assay):	
Negative assay (this subgroup is called 'slow responders')	Continue treatment for a total of 48-72 weeks. 72 weeks therapy has generally shown superior results as compared to 48 weeks therapy in slow responders[84-86]
Positive assay	Stop treatment as probability of attaining SVR is negligible
Week 48 qualitative HCV RNA assay:	
Negative assay i.e. a case of ETR	Successful therapy. Needs a repeat qualitative HCV RNA assay at week 72 (24 weeks after ETR) to establish SVR
Positive assay	Treatment failed
Week 72 qualitative HCV RNA assay:	
Negative assay i.e. a case of SVR	HCV infection got eradicated
Positive assay i.e. a case of relapse	**Previously treated with non-pegylated interferon:** •Treat with peginterferon and ribavirin. If EVR is not achieved at week 12, stop the treatment **Previously treated with pegylated interferon:** •Retreatment is not indicated even if a different type of peginterferon is administered. Consensus interferon has shown to improve responses in such cases, but it is too premature to recommend it.

ESPID-0120

FACULTY PHYSICIANS' KNOWLEDGE, ATTITUDE, AND PERCEPTIONS ABOUT ANTIMICROBIAL STEWARDSHIP – IS IT WORTH THE HYPE?

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Introduction:
Implementation of monitoring/intervention system recommended by Infectious Diseases Society of America (IDSA) to optimize & preserve effectiveness of current antibiotics. Strategy for success with education & prospective audit. Antimicrobial Stewardship Program (ASP) at Dayton Children's Hospital newly created multidisciplinary team. **Objectives:** (1) assess background knowledge/ initial acceptance of ASP (2) determine best feedback mechanism between prescribers & stewards.

Methods:
10-question survey based on CDC 'Get-Smart Campaign' distributed by email to medical staff physicians -included knowledge of ASP, comfort using antimicrobials, attitudes on prospective audits, and best feedback mechanisms.

Results:
Survey completed by 88 physicians - 34% community physicians, 5% hospitalists, 2.5% Critical Care, & 35% Specialists. 47% respondents have practiced for >20yrs. Majority indicated ASP extremely important (75%). 5% respondents not familiar with ASP. Addressing impact of antibiotic misuse as public health concern (62%) & improving patient safety (19.8%) seen as most important reasons for establishing ASP. Ciprofloxacin (77%) & Vancomycin (60.7%) were antimicrobials responders felt comfortable managing without Infectious diseases specialists. Guidelines with clinical pathways (64%) most beneficial IDSA ASP strategy for respondents followed by prospective audits (14.8%). 51% felt prospective audits educational and 40.7% felt comfortable having prospective audit. 5% physicians felt they should be able to make decisions independently. Majority respondents wanted ASP notification by email (53.1%).

Conclusions:
KAP surveys beneficial in implementing ASP to determine intial strategies & focus. Our KAP survey revealed physicians feel ASP extremely important and creating guidelines most beneficial to decrease antimicrobial misuse. Feedback will guide novel ASP efforts to target: hospital based guidelines, prospective audits, and de-escalation of therapy.

ESPID-0121

SINGLE-NUCLEOTIDE POLYMORPHISM RS7251246 IN ITPKC IS ASSOCIATED WITH SUSCEPTIBILITY AND CORONARY ARTERY LESIONS IN KAWASAKI DISEASE

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Background: Kawasaki disease (KD) is a multi-systemic vasculitis that preferentially affects children. A single nucleotide polymorphism (SNP) in inositol 1,4,5-trisphosphate 3-kinase C (*ITPKC*) has been identified to be an important polymorphism in the risk of KD. This study was conducted to comprehensively investigate the associations between all tagging SNPs of *ITPKC* in the risk of KD in a Taiwanese population.

Methods and Results: A total of 950 subjects (381 KD patients and 569 controls) were recruited. Seven tagging SNPs (rs11673492, rs7257602, rs7251246, rs890934, rs10420685, rs2607420, rs2290692) were selected for TaqMan allelic discrimination assay. Clinical data of coronary artery lesions (CAL) and aneurysms were collected for analysis. A significant association was found between rs7251246 in *ITPKC* and CAL formation. Haplotype analysis for *ITPKC* polymorphisms also confirmed this association in the patients with CAL and aneurysm formation.

Conclusion: This is the first study to identify that SNP rs7251246 in *ITPKC* is associated with the severity of KD.

ESPID-0124

INFLUENZA VACCINATION COVERAGE IN INFLAMMATORY BOWEL DISEASE CHILDREN

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Introduction: Inflammatory bowel disease (IBD) patients may be at risk for any infections due to an underlying disease, malnutrition, surgery, or immunosuppressive therapy. Therefore, protecting this group against infections seems to be of particular importance.

Objective: The aim of the study was to describe influenza vaccination status among pediatric patients with IBD.

Methods: This prospective study was conducted in four University-affiliated hospitals for children in Poland. Parents of children with IBD and parents of healthy controls were asked about influenza vaccination in season 2012/2013.

Results: 242 IBD patients and 142 controls were enrolled to the study. Of IBD patients 7.8% received an influenza vaccine compared to 18.3% of controls (p=0.0013). Children with IBD had less than two times chance to be vaccinated against influenza compared to controls (OR=2.6 CI95 1.4-4.9). There was no statistically significant differences in time from IBD diagnosis, disease activity and drugs between vaccinated and non-vaccinated IBD children. The most common reason pro vaccinations were fear of influenza complications (OR=2.02 95CI 0.3-11.8) and belief in influenza vaccine efficacy (OR=2.35, 95CI 0.2-24.5; p=0.6999). 56% of IBD patients gave the fear of vaccine side effects as a major reason for not being vaccinating compared to 40% of controls (OR=1.87 95CI 1.19-2.95).

Conclusion: In conclusion, the data of our study demonstrate an alarmingly poor influenza vaccination status in the majority of children with IBD in Poland.

ESPID-0127

DAPTOMYCIN IN THE TREATMENT OF INVASIVE GRAM-POSITIVE BACTERIAL INFECTIONS IN CHILDREN: WE CAN

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INTRODUCTION
Infectious diseases have emerged as an important cause of morbidity and mortality in pediatric patients. Resistant organisms are increasingly implicated in septic status concerning hospitalized children.

OBJECTIVES
The emergence and dissemination of antimicrobial resistance among GRAM positive pathogens
has become troublesome for children. Only few antimicrobial agents are available for multi-drug
resistant infections in pediatric patients.
AIMS
Daptomycin is a first in its class cyclic lipopeptide which can be useful for treatment of these
infections in children, but clinical experience is lacking.
METHODS
Retrospective review of medical records of sixteen hospitalized children who received Daptomycin for treatment of invasive GRAM positive bacterial infections at Children's Hospital of ARNAS Civico, Palermo (Italy), from December 2009 to December 2012. Bacterial isolates were tested for
susceptibility to Daptomycin by gradient diffusion method. Clinical manifestations of infections in
these patients were: complicated soft tissue and skin infections (cSSTI) in ten cases and bloodstream infections in six cases.
RESULTS
Sixteen children received Daptomycin. All these patients were receiving care in our Intensive Care Unit. Organisms isolated were six S. Aureus methicillin-resistant; eight S. Epidermidis methicillin-resistant and two E. faecium. All these infections had failed standard empirical antimicrobial therapy and had persistently positive blood cultures and/or fever prior to initiation of Daptomycin.
CONCLUSIONS
All our patients improved, only two died of complications of their pre-existing pathology. Further studies are necessary to assess the pharmacological characteristics, safety and effectiveness of Daptomycin in children, but it seems to be promising antimicrobial agent in pediatric patients.

ESPID-0129

EVALUATION OF THE SYSTEMIC ABSORPTION OF OZENOXACIN 1% CREAM IN PEDIATRIC AND ADULT PATIENTS WITH IMPETIGO

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Introduction

Ozenoxacin is a topical non-fluorinated quinolone with potent activity against gram-positive bacteria developed as a 1% cream for the treatment of impetigo.

Objectives and aims

The objectives of the study were to assess the systemic absorption, the safety and tolerability, and the clinical response after 5 day BID applications (10 applications) of ozenoxacin 1% cream in adults and pediatric patients (aged 2 months to 65 years) with impetigo.

Methods

Patients (≥ 2 months to 65 years) were included sequentially in the following age groups:

- Group 1 (18 years to 65 years): 8 patients.
- Group 2 (12 years to < 18 years): 9 patients.
- Group 3 (2 years to < 12 years): 9 patients.
- Group 4 (2 months to < 2 years) subdivided in the following subsets:
    - 12 months to < 2 years: 8 patients.
    - 6 months to < 12 months: 6 patients.
    - 2 months to < 6 months: 6 patients.

Absorption was evaluated by measuring plasma concentrations of ozenoxacin, safety by physical examination and patient (or family) report and clinical response was evaluated by clinical evaluation with the SIRS scale.

Results

All plasma concentrations (except of 4 samples) were BLQ (0.5 ng/mL).
The safety and tolerability was very good in all age groups.
All the patients were cured or improved.

Conclusions

Ozenoxacin 1% cream 5 day BID topical application show no absorption, is safe and well tolerated and show clinical activity in patients with impetigo aged 2 months to 65 years.

ESPID-0130

CLINICAL TRIAL TO ASSESS THE EFFICACY, SAFETY AND TOLERABILITY OF OZENOXACIN 1% CREAM IN PATIENTS WITH IMPETIGO

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Introduction

Ozenoxacin is a topical non-fluorinated quinolone with potent activity against gram-positive bacteria developed as a 1% cream for the treatment of impetigo.

Objectives and aims

The objectives of the study were to compare the efficacy and evaluate the safety and tolerability of ozenoxacin 1% cream versus placebo after 5 day BID topical applications (10 applications) in patients with impetigo.

Methods

Multicentre, randomized, placebo-controlled, parallel, double-blind in adult and pediatric patients (aged 2 years and older) with bullous and non-bullous impetigo. Patients were randomized in a 1:1:1 ratio to ozenoxacin, placebo, or retapamulin (included as active control to assess the internal validity of the study). The efficacy was evaluated clinically by SIRS scale and microbiologically by microbiological culture. The safety and tolerability were evaluated by physical examination, laboratory tests, and direct patient (or family) report.

Results

Ozenoxacin showed statistically significant superior clinical response compared to placebo at end of treatment (day 6-7) (table 1). The results for retapamulin were similar to ozenoxacin.

Table 1. Clinical response at end of therapy (Visit 3, Day 6-7) (ITTC population)			
P880	**Ozenoxacin**	**Placebo**	**Retapamulin**
N	155	156	154
Clinical success n (%)	54 (34.8%)	30 (19.2%)	58 (37.7%)
Clinical failure n (%)	98 (63.2%)	120 (76.9%)	91 (59.1%)
Unable to determine n (%)	3 (1.9%)	6 (3.8%)	5 (3.2%)
p-value (vs placebo)	**0.003**		**<0.001**

Ozenoxacin showed statistically significant superior microbiological response compared to placebo at day 3-4 and at end of treatment (day 6-7) (table 2).

Table 2. Microbiological response at Visit 2 (day 3-4) and Visit 3 day (6-7) (ITTB population)			
P880	**Ozenoxacin**	**Placebo**	**Retapamulin**
Day 3-4			
N	154	152	153
Microbiological success	109 (70.8%)	58 (38.2%)	86 (56.2%)
Microbiological failure	37 (24.0%)	90 (59.2%)	60 (39.2%)
Unable to determine	8 (5.2%)	4 (2.6%)	7 (4.6%)
p-value	**<0.0001**		
Day 6-7			
N	154	152	153
Microbiological success n (%)	122 (79.2%)	86 (56.6%)	124 (81.0%)
Microbiological failure n (%)	16 (10.4%)	55 (36.2%)	18 (11.8%)
Unable to determine n (%)	16 (10.4%)	11 (7.2%)	11 (7.2%)
p-value (vs placebo)	**<0.0001**		

Ozenoxacin was safe and well tolerated.

Conclusions

Ozenoxacin showed superior clinical and microbiological response to placebo and presented a very good safety and tolerability profile. The results for retapamulin confirmed the validity of the study.

ESPID-0131

HIGH PREVALENCE OF OCCULT HEPATITIS B VIRUS INFECTION IN CHILDREN BORN TO HBSAG-POSITIVE MOTHERS DESPITE PROPHYLAXIS WITH HEPATITIS B VACCINATION AND HBIG

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Background: Occult hepatitis B virus (HBV) infection is a well-recognized clinical entity characterized by the detection of HBV DNA in serum and/or in liver in the absence of detectable hepatitis B surface antigen (HBsAg). The frequency of the diagnosis depends on the relative sensitivity of both HBsAg and HBV DNA assays.

Objective: To determine the prevalence of occult HBV infection in a high risk group of children who developed HBV infection despite immunoprophylaxis.

Methods: the sera of 75 children born to HBsAg-positive mothers previously immunized by HBIG and prophylaxic vaccine regimen were assayed for HBV DNA by real-time PCR. Subsequently, the samples were tested by a sensitive standard PCR employing independent set of primers for all HBV genes and analyzed by direct sequencing.

Results: HBV DNA was detected in 21/75 (28%) of children, ranged between 77 and 9240 copies/mL. All were positive for anti-HBs. 5 (24%) were found to be positive for anti-HBc, and anti-HBc-only positive individual were not observed. 8 isolates (38%) did not contain any mutation. Other 13 infected children (62%) contained at least one mutation in regions known to be involved in functional and/or immune epitope activity. 10 were contained G145R mutations.

Conclusion: HBV occult infection seems to be relatively frequent in immunized children born to HBsAg-positive mothers. HBsAg negativity is not sufficient to completely exclude HBV DNA presence. These findings emphasize the consideration of occult HBV infection in hypo endemic areas.

ESPID-0133

PRELIMINARY RESULTS OF THE PNEUMONIA ETIOLOGY RESEARCH FOR CHILD HEALTH (PERCH) STUDY

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The PERCH Study Group Background: Pneumonia is responsible for over 1 million annual deaths in children 1-59 months. PERCH is a multi-country, case-control study aiming to characterize the etiologies and risk factors children under 5 years of age hospitalized with pneumonia in developing country settings. Methods Children aged 28 days – 59 months hospitalized with WHO-defined severe or very severe pneumonia and age-frequency matched community controls from seven countries (Gambia, Kenya, Mali, South Africa, Zambia, Bangladesh, Thailand) were enrolled over a 24 month period. Specimens from cases only included blood culture, induced sputum, lung aspirates (selected sites), and gastric aspirates. Specimens from cases and controls included nasopharyngeal/oropharyngeal swabs (NPS/OPS), whole blood & urine. Laboratory tests included microscopy, culture, antigen detection, multiplex real-time PCR (33 pathogens), and antibiotic bioassay. CXR from all cases were classified by WHO criteria. Results: Enrollment (8/2012-2/2014) is complete at 4,229 cases and 5,325 controls. Case fatality varied by site (1.1% to 34.2%) and severity status. A pathogen was isolated in 4.4% of blood cultures and in >98% of NPS/OPS PCR from cases and controls. Cases and controls were usually positive for >1 pathogen by NPS/OPS PCR (mean=3.9 and 3.6 pathogens, respectively). Existing analytic methods for pneumonia etiology cannot incorporate results from multiple tests/specimens, or account for imperfect sensitivity and specificity. We have developed new statistical methods, extending familiar methods, to overcome these limitations. Conclusions: By applying state-of-the-art tools with standardized methods PERCH will inform development of new vaccines and treatment policies for the prevention and control of serious childhood pneumonia.

ESPID-0136

RECOMMENDATIONS FOR SURVEILLANCE BLOOD CULTURES FOR CHILDREN WITH INVASIVE MUSCULOSKELETAL INFECTION AND PROLONGED HOSPITALIZATION

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Background/Aims: Children with musculoskeletal infection (MSI) who have prolonged hospitalization often have multiple blood cultures following an initial positive blood culture and during febrile days on antibiotics. This potentially leads to unnecessary blood draws. This study assesses the incidence of persistent bacteremia or line sepsis in pediatric MSI and suggests a strategy to reduce repeat blood cultures without missing pathogens that would alter treatment.

Methods: Children with Osteomyelitis, Septic Arthritis, and Pyomyositis treated with antibiotics and/or surgery were studied. Blood culture results following the initial blood culture were evaluated to identify the rate of positivity, persistent bacteremia, or unique pathogens representing line sepsis.

Results: 593 children with invasive MSI (osteomyelitis – 353, septic arthritis – 198, and pyomyositis – 42) were studied from 2002-2013. Initial bacteremia was identified in 116 children (19.6%). Of the 874 subsequent blood cultures sent there were 189 positive results (21.6%) in 89 children. 66 children demonstrated persistent bacteremia with 2-5 positive cultures each. An organism other than the initial isolate for which the child was actively being treated was identified in seven children. Three were suspected contaminants and four were pathogens causing line sepsis (*Escherichia coli, Candida albicans, Candida dubliniensis, and Staphylococcus haemolyticus*). Among 89 children who had subsequent positive blood cultures, 37 had five or more negative repeat cultures for a total of 382 studies (range 5-27 per child, median 10).

Conclusions: Judicious use of repeat blood cultures in MSI will avoid unnecessary studies with limited clinical usefulness. A scheduled surveillance strategy is recommended.

ESPID-0137

A PROPOSED CULTURE STRATEGY FOR PEDIATRIC MUSCULOSKELETAL INFECTION

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Background/aims: Culture strategies for pediatric musculoskeletal infection (MSI) influence diagnostic accuracy and treatment efficacy. This study analyzes the merit of various culture strategies for pediatric MSI and proposes guidelines to optimize culture outcomes with less waste.

Methods: Children with MSI from 2002 to 2013 were studied. Results were assessed for aerobic, anaerobic, fungal, acid fast bacteria (AFB), and blood cultures. Statistical comparison was performed to assess the yield of each culture type during three periods in which differing strategies were employed.

Results: 4536 culture results (aerobic – 1303, anaerobic – 903, fungal – 340, AFB – 289, blood – 1701) were assessed for 867 children with MSI. Initial aerobic cultures in children with osteomyelitis were positive in 94.5% of children during 2012-2013, compared to 76.6% in 2009, and 66.4% in 2002-2004 ($p<0.0001$). Anaerobic cultures were considered contaminant or equivalent to aerobic culture findings in 19/22 children. Fungal isolates were identified by aerobic culture in 5 of 6 children with positive fungal cultures. All but one of the remaining anaerobic, fungal, and AFB isolates resulted from penetrating inoculation. Blood cultures in abscess cases were either negative or contaminant. Duplicate aerobic specimens had identical results in 189/250 (76%) cases in which they were sent.

Conclusions: Pediatric MSI should be evaluated initially solely with blood cultures and aerobic cultures from the infection site. Blood cultures should not be routinely sent in abscess cases. Anaerobic, fungal and AFB cultures should be reserved for children with immune compromise, suspected penetrating inoculation, or failed treatment.

ESPID-0138

THE UTILITY OF POLYMERASE CHAIN REACTION AS A SUPPLEMENTAL TOOL IN THE DIAGNOSIS OF SEPTIC ARTHRITIS IN CHILDREN

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Background/Aims: The culture positive rate among children with septic arthritis is low. Culture negative cases are often treated empirically as *Staphylococcus aureus*. This antibiotic coverage may not be suitable for *Kingella kingae* or *Streptococcus pneumoniae*. This study assesses the diagnostic utility of polymerase chain reaction (PCR) for pediatric septic arthritis.

Methods: Children with septic arthritis from 2012 to 2013 were studied. Joint fluid Cell count, aerobic culture results, and antibiotic treatment decisions were assessed. Comparison was made between those evaluated with and without PCR.

Results: Aerobic cultures and PCR samples were sent from 35 children. PCR was positive in 16 cases (45.7%) while aerobic cultures were positive in 11 (31.4%). PCR was positive in 6/24 (25%) culture negative cases (*K. kingae* – 4, *S. pneumoniae* – 1, and *S. aureus* – 2). These findings resulted in change of antibiotic selection in 5 children. Aerobic cultures were positive in 2/19 (10.5%) PCR negative cases (*Salmonella* – 1, and *S. aureus* -1). PCR and aerobic cultures were simultaneously positive in 9 children, with agreement of results for the isolate in each case (*S. aureus* – 5, *K. kingae* – 2, *S. pneumoniae* – 1, and *Shigella* – 1). Combined sensitivity of the studies was 49%.

Conclusions: PCR is a useful supplemental study for children with septic arthritis and may guide treatment for children with *Kingella kingae* or *Streptococcus pneumonia*. Limitations of this technology include time delay for results and lack of antibiotic susceptibility information for the identified organism in culture negative cases.

ESPID-0139

THE INFLUENCE OF VIRAL LOAD ON THE SENSITIVITY OF BINAX NOW RSV ASSAY IN THE DIAGNOSIS OF RSV BRONCHIOLITIS

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Introduction:
Each year Respiratory Syncitial Virus (RSV) is responsible for 3.4 million hospitalisations in children under 5 years. Hospital acquired infection can be fatal in children with co-morbidites. Our tertiary paedaitric unit uses an immuno-chromatographic assay (Binax Now RSV) in the diagnosis of RSV, the results of which often guide co-horting practices.
Aims:
We aimed to evaluate the accuracy of Binax Now RSV.
Methods:
Cylce threshold (CT) values, as determined by Real Time PCR were compared with samples testing Binax Now RSV positive with those testing negative.
Results:
BInax Now RSV positive values had significantly lower mean CT values ($P<0.01$). If Binax Now RSV was compared to a PCR CT cut-off of 23 cycles, the sensitivity was 92.2%. A value of 23 cycles had the highest discrimination between Binax Now RSV positive and negative tests.
Conclusion:
Clinical accuracy of Binax Now RSV is affected by viral load. A negative Binax Now RSV may not exclude RSV bronchiolitis but indicates that the viral load may be sufficiently low to allow co-horting amongst low risk patients.

ESPID-0140

INHERITED TLR3 DEFICIENCY IN CHILDREN WITH HSE: A COMMON GENETIC ETIOLOGY WITH HIGH ALLELIC HETEROGENEITY AND HIGH RECURRENT RISK

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Single-gene inborn errors of Toll-like receptor 3 (TLR3)-interferon (IFN) immunity have been described in 10 children with herpes simplex virus 1 encephalitis (HSE). We searched for *TLR3* mutations in 110 other children with HSE. In six unrelated children or young adults with HSE, we identified five unique or extremely rare (MAF < 0.001) missense mutant alleles. We report three novel forms of TLR3 deficiency: heterozygous L360P, heterozygous G743D+R811I and homozygous R867Q mutations were identified in three patients and led to impaired TLR3 responses and enhanced viral susceptibility in dermal fibroblasts. These mutations exert their effects through different mechanisms: L360P is loss-of-function due to a lack of cleavage and dominant by negative dominance, G743D+R811I is loss-of-function due to low levels of expression and dominant by haploinsufficiency, and R867Q is functionally hypomorphic and underlies partial AR TLR3 deficiency. We also showed that two TLR3 alleles (M374T, D592N) that were heterozygous in three patients were not deleterious *in vitro* in the experimental conditions used. Thus, to date, TLR3 deficiency has been identified in six (5%) of the 120 patients studied. Interestingly, four (66%) of the six TLR3-deficient patients had at least one late relapse of HSE, whereas relapse occurred in only 12 (10%) of the total cohort of 120 patients. TLR3 deficiency therefore appears to be particularly common in the subgroup of patients with recurrent HSE (4/12; 33%). Searches for rare mutant *TLR3* alleles and careful biochemical studies of these alleles are required in children with HSE, particularly those with recurrent HSE.

ESPID-0141

ASSOCIATION BETWEEN BMI TO SEVERITY OF DENGUE HEMORRHAGIC FEVER AMONG CHILDREN AGED 3-18 YEARS OLD IN TERTIARY HOSPITAL IN QUEZON CITY JULY 2008 - JUNE 2013

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Objective. To determine the association of BMI to severity of dengue cases among admitted patients at a tertiary hospital July 2008 - June 2013.**Setting.**Medical record at a tertiary hospital in Q.C.**Method.**This is a retrospective cohort study.Only 226 from 774 patients admitted with DHF were included in this study. Excluded were those patients with comorbidities and no serology test done. Severity of dengue was classified either as mild (DHF I and II) and severe (DHF III and IV). Data were tabulated using frequency distribution according to age, gender, BMI and severity of dengue. Chi square with level of significance set at p value of <0.05 and Odd's ratio were used to determine the risk between BMI and severity of dengue using SPSS version 18 software.**Results.**Out of 226subjects, 16.8% was classified as severe dengue and 83.2% was with mild dengue. 60% had normal BMI and 40% was either with obesity or overweight. Among 91 subjects with obesity or overweight, 25.2% suffered from severe dengue and among the 135 subjects with normal BMI, 11.1% suffer from severe dengue. Significant difference between BMI and severity is computed at p<0.020. Children with obesity or overweight have 2.5 and 2.8 times risk respectively of suffering more likely from severe dengue than children with normal BMI.**Conclusion.** There is higher risk of having severe dengue among overweight or obese pediatric patients.**Recommendation.** Children with DHF, especially those who are obese or overweight should be diagnosed, treated early, and have closely monitored to prevent shock.

Keywords.*Dengue, Body Mass Index*

ESPID-0142

CLINICAL MANIFESTATION OF HELICOBACTER PYLORI INFECTIONS IN CHILDREN HOSPITALIZED IN THE DEPARTMENT OF PAEDIATRICS BETWEEN 2008 AND 2010

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In Poland, *Helicobacter pylori* infections affect 60-70% of adults and about 30% of children under 18 years of age. A close relationship between the incidence of peptic ulcer disease and this infection has been proven. However, the clinical symptoms are very often uncharacteristic. **Aim of this study** was to evaluate the clinical manifestation of *Helicobacter pylori* infections in children hospitalized in the Department of Paediatrics, Medical University of Silesia, between 2008 and 2010. **Patients and methods:** The study included 102 children, at the ages of 1.5 - 18 years (average age - 13 years and 3 months): 61 girls (59.8%) and 41 boys (40.2%) diagnosed with *Helicobacter pylori* infection. The diagnosis was based on the clinical manifestation, confirmed by the upper gastrointestinal endoscopy and the urease test. The analysis included clinical symptoms, laboratory abnormalities, results of the upper gastrointestinal endoscopy and histopathological findings. **Results:** The mean age of children diagnosed with *Helicobacter pylori* infection was 13 years. The infection was significantly more often diagnosed in children of school age (92/102- 90.2 %). Patients in the youngest age group (< 2 years) accounted for only 1.6 % (1/102).The clinical presentation was dominated by abdominal pain (61/102 - 59.8 %), low body mass (37/102 - 36.3%), vomiting (21/102 - 20.6%) and diarrhea (21/102 - 20 , 6%) . Anemia, mainly due to iron deficiency, was observed in 6.9% of patients (7/102) . The levels of inflammatory markers were elevated in 5.9% of patients (6/102).
The upper gastrointestinal endoscopy usually demonstrated reddening of the mucosa in the prepyloric area, with associated '*cobblestoning'.* The most frequently observed histopathological lesions were those corresponding to chronic superficial gastritis (39/102 - 38.2) and chronic superficial gastroduodenitis (34/102 - 33.3%) . All the children had positive results of the urease test. The abdominal ultrasound showed no abnormalities.
Conclusions: It seems reasonable to perform tests for *Helicobacter pylori* infection in children with symptoms from the gastrointestinal tract and non -characteristic symptoms.

ESPID-0143

ANTIBIOTIC SURVEY IN A NEONATAL INTENSIVE CARE UNIT: EVIDENCE VERSUS PRACTICE

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Background: Inappropriate neonatal antibiotics therapies lead to the emergence of antimicrobial-resistant bacteria and expose newborns to antibiotic resistance. Few studies have evaluated the accuracy of antibiotics prescribing practices in neonatal intensive care units (NICU).

Objectives: To evaluate antibiotic regimens in our NICU and to compare them to the international guidelines regarding both specificity of newborns and bacteriological data.

Methods: A 2 months prospective study in neonates admitted to NICU level III from May 1st to June 30th 2013. For each antibiotics course, the choice and the duration of systemic treatment, neonatal data and bacteriological data were reviewed.

Results: 58 treated neonates were included, 3 babies died with no death related to sepsis. 68 antibiotics courses were studied, corresponding to 73% materno-foetal (MFI) and 26% nosocomial (NI) neonatal suspected infections. We reviewed 304 antibiotic-days. 16 antibiotic courses (24%) and 88 (29%) antibiotic-days were considered not to be consistent with the recommendations. Tritherapy with Cefotaxim-Amoxicillin-Aminoglycosid association (44%) remained the treatment of choice for MFI. Cefotaxim and Vancomycin were the drugs most commonly used with respectively 53 (26%) and 24 (24%) antibiotic-days considered to be inappropriate.

Conclusion: Antibiotic survey in our NICU revealed 24% antibiotics courses not consistent with the guidelines. Implementation of standardized and specific protocols may optimize quality of antibiotics prescribing practices and antibiotic therapy in the newborn.

ESPID-0144

PLASMA MICRORNAS ABERRANTLY EXPRESSED IN HBEAG-POSITIVE CHILDREN ARE DELINEATED BY ONCOGENIC LIVER-SPECIFIC TARGET GENES

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Background and Aim: HBeAg-positive children are at particular risk of developing hepatocellular carcinoma and cirrhosis. Liver damage is caused by the host immune response to infected hepatocytes, and microRNAs are suggested to play a role in this complex interaction between virus and host. We hypothesise that specific microRNAs impact the progression of childhood CHB. The present study aimed to identify microRNAs with liver-specific target genes and aberrant plasma expressions in HBeAg-positive children.

Patients and Methods: A previously published screen of microRNA plasma levels in HBeAg-positive, HBeAg-negative, and healthy children was reassessed, and criteria were applied to identify candidate microRNAs aberrantly expressed in HBeAg-positive children. Bioinformatics analysis was performed on candidate microRNAs. Those candidate microRNAs with liver-specific target genes were selected for validation by qRT-PCR on plasma from 34 HBeAg-positive, 26 HBeAg-negative, and 60 healthy controls.

Results: For a total of 13 microRNAs liver-specific target genes were retrieved and aberrant plasma expressions in HBeAg-positive children were identified. Three microRNAs showed interesting expression profiles: microRNA levels were elevated in HBeAg-positive children, but equal in HBeAg-negative and healthy children. Interestingly, the pathways regulated by the three microRNAs target genes have at least one target in common: the proto-oncogene c-MYC.

Conclusion: We are the first to identify microRNAs with liver-specific target genes and aberrant plasma expressions in HBeAg-positive children. Our results suggest specific microRNAs play a role in the progression of childhood CHB. However, functional studies are warranted to further elucidate the role of these microRNAs in the immunopathogenesis of CHB in children.

ESPID-0146

ISOTONIC VERSUS HYPOTONIC PARENTERAL MAINTENANCE FLUIDS IN CHILDREN WITH VERY SEVERE PNEUMONIA: A RANDOMIZED CONTROLLED TRIAL

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INTRODUCTION: Pneumonia is the leading cause of mortality in children under five years, especially in developing countries. In addition to antibiotics, children with very severe pneumonia require supportive therapy in the form of intravenous fluids. These children are at risk of developing hyponatremia due to non-osmotic release of vasopressin(ADH).
OBJECTIVE: To determine the incidence of hyponatremia in children with very severe pneumonia receiving Isotonic(0.9%saline with 5%dextrose) and Hypotonic(0.18%saline with 5%dextrose) intravenous fluids.
AIM: To compare the effect of Isotonic and Hypotonic fluids on the serum sodium concentration of children with very severe pneumonia at 6,12 and 24 hours.

METHODS: Children aged 2 months – 5 years with Very Severe Pneumonia (as per WHO-IMNCI criteria) were randomized to Isotonic(n-59) and Hypotonic(n-60) groups in this open-labelled trial. Analysis was done by both intention-to-treat and per-protocol. Serum sodium was analysed at 6, 12 and 24 hours.***(CTRI/2013/02/003398)***

RESULTS: Out of the 119 randomized children, analysis was done in 100 children. 19 children were trial deviants.
TABLE-1: Incidence of Hyponatremia at different study points:

TIME OF STUDY(hrs)	ISOTONIC(n-50)	HYPOTONIC(n-50)	p-Value
6	0(0%)	5(10%)	0.113
12	1(2%)	10(20%)	0.008
24	1(2%)	13(26%)	<0.001

At the end of study, 8.6% children in Hypotonic group required a modification of fluid regimen due to moderate hyponatremia as opposed to none in Isotonic group(p-0.047).
No child in either group developed hypernatremia.

CONCLUSIONS: This study elucidates the risk of hyponatremia due to hypotonic fluids in children with very severe pneumonia and advises caution against routine usage of the same.

ESPID-0149

VITAMIN D AND TUBERCULOSIS: A MULTICENTER STUDY IN CHILDREN

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Introduction: tuberculosis is a re-emerging disease in industrialized countries and is a significant cause of death in children and adults in developing countries. Recently a role for vitamin D in the immune response to tuberculosis infection has been speculated.

Objectives: to evaluate vitamin D levels in children with latent and active tuberculosis compared to healthy controls of the same age and ethnical background.

Aims: to evaluate a possible role of vitamin D in the treatment and prevention of tuberculosis in children.

Methods: a multicenter observational study has been conducted in three tertiary care paediatric centres: Anna Meyer Children's University Hospital, Florence, Italy; Evelina London Children's Hospital, London, United Kingdom and Great Ormond Street Hospital, London, United Kingdom. Vitamin D (25-hydroxycholecalciferol) was considered deficient if the serum level was <25 nmol/L, insufficient between 25 and 50 nmol/L and sufficient for a level >50 nmol/L.

Results: the study population included 996 children screened for tuberculosis, which have been tested for vitamin D. Of those 44 children (4.4%) had active tuberculosis, 138 (13.9%) latent tuberculosis and 814 (81.7%) were controls. Our study confirmed a high prevalence of hypovitaminosis D overall in the study population (47%), that increased to 58% in the latent tuberculosis and to 75% in the active tuberculosis groups (p<0.0001). A multivariate analysis confirmed an increased risk of hypovitaminosis D in children with latent and active tuberculosis compared to controls [(P=0.018; RR=1.61; 95%CI: 1.086-2.388), (P<0.0001; RR=4.587; 95%CI:1.190-9.608)].

Conclusions: in our study hypovitaminosis D was significantly associated with tuberculosis infection.

ESPID-0150

ASTHMA, QUALITY OF LIFE AND LUNG FUNCTION IN ADULTS 30 YEARS AFTER RSV HOSPITALIZATION IN INFANCY

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Introduction: Long-term outcome after respiratory syncytial virus (RSV) lower respiratory tract infection (LRTI) in infancy still needs clarification.

Aims: To evaluate the association between RSV LRTI hospitalization in infancy and asthma, respiratory health-related quality of life and lung function at age of 28–31 years.

Methods: In 1981–1982, 81 infants were hospitalized for RSV LRTI. In 2010, at age 28–31 years, 43 former patients with either confirmed (N=23, 53%) or highly probable (N=20, 47%) RSV LRTI and 86 population-based controls attended the clinical study. Asthma was classified as doctor-diagnosed or self-reported asthma, based on doctor-prescribed medication for asthma and the presence of asthma-presumptive symptoms, in a structured questionnaire. In addition, the participants completed Saint George's Respiratory Questionnaire (SGRQ) for the quality of life.
Measured spirometry indices were pre-bronchodilator (pre-BD) and post-bronchodilator (post-BD) forced vital capacity (FVC), forced expiratory volume in one second (FEV1) and FEV1/FVC-ratio, presented as % of predicted (FVC%, FEV1% and FEV1/FVC%).

Results: 23-28% of RSV LRTI patients and 13-17% of controls had asthma depending on the definition, without significant differences between groups. Former RSV LRTI patients had lower quality of life in SGRQ compared to controls. Both pre-BD and post-BD FEV1% and FEV1/FVC% were significantly lower in former RSV LRTI patients than in controls.

Conclusions: RSV LRTI hospitalization in infancy is associated with an increased risk of permanent obstructive lung function disorder in adulthood. Asthma risk was not increased, but respiratory health-related quality of life was lower after RSV LRTI in infancy compared to controls.

ESPID-0151

ANTIBIOTICRESISTANCE PATTERNS IN CHILDHOOD OSTEOMYELITIS 2001-2011

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Background:

Osteomyelitis occuring during childhood is a rather rare disease. It is mostly caused by *Staphylococcus aureus.* During the last decade a worldwide emerge of methicillin resistant staphylococci (MRSA) was detected.

Objectives and Material and Methods:

Our study was aimed to evaluate retrospectively the causative agents and the specific antibiotic resistance patterns of osteomyelitis cases at the Department for Pediatrics, Medical University Innsbruck, for the years 2001-2011 among children aged 0-18 years. Furthermore, the efficacy of the established first-line antibiotics was evaluated.

Results:

During the study period 43 patients were hospitalized because of an onset of osteomyeltitis. In 12 cases a positive blood culture was detected (*Staphylocuccus aureus* 66,7%; 33,3 % other bacteria). Cefuroxime and fosfomycin were used as first-line antibiotics. Antibiotic therapy was given intravenously for about 23,70±14,43 days (21; 5 – 51 days). Afterwards the oral antibiotic therapy was administered for 39,00±42,36 days (21; 17 – 150 days).

Conclusion:

During the study periode no emerge of multiresistant bacteria was detected. The used first-line antibiotic treatment was antibactirial according to the antibiograms. Acutally there is no need for adaptations of the used first-line therapy. Due to changing resistance patterns in specific geographic regions a further evaluation of causative bacteria and resistance patterns is needed.

ESPID-0152

A CASE OF PERINATAL TRANSMISSION OF ENTEROVIRUS INFECTION – MANAGEMENT AND MEASURES TAKEN TO PREVENT ONWARD TRANSMISSION IN THE NEONATAL UNIT

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INTRODUCTION: Enterovirus infection can cause serious illness in neonates and cause outbreaks in neonatal intensive-care units (NICUs).

SYNOPSIS: Baby S was delivered by emergency caesarian section at 35+2 weeks gestation. His mother had been admitted to hospital 24-hours earlier with meningitis.

The baby required endotracheal surfactant and continuous positive airways pressure (CPAP) ventilation for respiratory distress soon after birth. He was admitted to the NICU for empirical antimicrobial treatment pending definitive maternal diagnosis. Enterovirus RNA was detected in maternal cerebrospinal fluid by real-time polymerase chain-reaction (RT-PCR). Bacterial cultures and RT-PCR for enterovirus in infant plasma were negative at birth. The baby had contact with and was breastfed by his mother.

He developed a maculopapular rash on day 3, with impaired respiratory function and perfusion on day 6 necessitating further non-invasive ventilation and intravenous fluid support. Enterovirus RNA was detected in stool and throat-swab taken contemporarily. Echocardiogram showed biventricular hypertrophy but normal function. The virus from all specimens was identified as Coxsackie type B4.

The baby was individually barrier-nursed by assigned staff and the high-dependency area was closed to new admissions. Babies who had been potentially exposed were cohorted in the same room.

The baby made a gradual recovery and was discharged at day 16. Exposed babies were isolated for a further 5 days but no further cases were detected.

CONCLUSION: Enterovirus infection caused a serious sepsis-like illness in this premature neonate. Prompt infection-control measures prevented onward transmission in the NICU.

ESPID-0153

LOW WILLINGNESS TO VACCINATE CHILDREN AGAINST VARICELLA IN THE NETHERLANDS

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Introduction

Before considering introduction of (universal) varicella vaccination in the Netherlands, it is important to have insight into the willingness to vaccinate among the population. We studied the willingness to vaccinate against varicella among parents and health care professionals.

Methods

A random sample of 1500 parents with at least one child aged 0-4 years, selected from the national immunisation register, were invited to participate in an internet survey on vaccination against varicella (33% response). Furthermore, all medical professionals of the public health infectious disease departments (N= 269) and a regional sample of child health clinic professionals (N= 563) received an internet survey on introduction of universal varicella vaccination (67% and 46% response respectively).

Results

Only 28% of the parents would be willing to vaccinate their child against varicella. The most important reason for parents not to consider varicella vaccination was that they perceived varicella as a mild disease for which vaccination is not needed. Only 21% of the health care professionals supported introduction of universal varicella vaccination. The majority of the professionals (72%) preferred to limit varicella vaccination to risk groups to prevent severe varicella disease or complications.

Conclusions

This study showed low intention among parents and health care professionals in the Netherlands to vaccinate children against varicella. Because this low intention could result into low national vaccine uptake, the possibility of a higher age of infection with increased complication rate needs special attention. These results need to be taken into account when considering (universal) varicella vaccination in the Netherlands.

ESPID-0154

THE USEFULNESS OF BMS IN CHILDREN WITH BACTERIAL MENINGITIS IN A POPULATION WITH LOW RATES OF VACCINATION AGAINST S.PNEUMONIAE AND N.MENINGITIDIS

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Introduction

The Bacterial Meningitis Score (BMS) was developed to identify children with a low risk of developing bacterial meningitis. It was validated in a population with high coverage of vaccination against *S.pneumoniae* and *N.meningitidis*.

Aims

This study was undertaken to evaluate the usefulness of BMS in Polish population with low pneumococcal and meningococcal vaccination rates.

Methods

Retrospective analysis of medical records of patients, hospitalized in Infectious Diseases Departmnent with a diagnosis of bacterial meningitis in years 2007-2013. For each patient a number of points in BMS was calculated.

Results

In the analyzed group there were 55 children: 22 girls and 33 boys. Mean age was 58 months (95% CI 40.23 to 77.11). No fatal cases were observed. Mean number of points in BMS was 2.84 (95%CI 2.57-3.11). When BMS was calculated, no patients had 0 points, 4 patients showed BMS=1point, 16 patients BMS=2points, 24 patients BMS=3points, 7patients BMS=4points and 4 patients had BMS=5points. With respect to BMS criteria, 93% had a CSF protein level of 80 mg/dL or higher, and 74% had a CSF neutrophil count of 1,000 cells/mm^3 or higher, 69% has neutrophil count 10,000 cells/mm3 or higher, 14% of the patients had a history of seizure, 9% had a positive CSF Gram stain. The commonest bacterial pathogens were *N.meningitidis* (58%) and *S.pneumoniae* (23%). **Conclusions**

1. The Bacterial Meningitis Score correctly identified acute bacterial meningitis in a population with low coverage of vaccination against *S.pneumoniae* and *N.meningitidis*.
2. The commonest abnormality was elevated protein level in cerebro-spinal fluid.

ESPID-0155

VACCINE IMPACT ON CHILDHOOD MENINGITIS AND SEPTICAEMIA: FIVE DECADES OF HOSPITAL ADMISSION TRENDS IN CHILDHOOD INVASIVE BACTERIAL DISEASE IN ENGLAND

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Background and Aims: To report on hospital admission rates for meningitis and septicaemia caused by *Haemophilus influenzae*, *Neisseria meningitidis* and *Streptococcus pneumoniae* in children in England.

Methods: Annual hospital admission rates for *H. influenzae,* meningococcal and pneumococcal meningitis and septicaemia in children aged <15 years were analysed using national hospital statistics available from 1968 to 2011, based on discharge coding at National Health Service hospitals, and Oxford record linkage study data, available from 1963 to 2011.

Results: These data showed a reduction in childhood invasive bacterial disease hospital admission rates after the introduction of conjugate vaccines. Annual rates of *H. influenzae* meningitis reduced from 6.72/100 000 children in 1992 to 0.39/100 000 in 1994 following the introduction of routine Hib vaccination. There was a small rise in admissions in the early 2000s which reduced following the implementation of a booster vaccination. Meningococcal infections increased during the 1990s, reaching a peak in 1999 at 34.54/100 000. Hospital admissions fell after the MenC vaccine was introduced and were 12.4/100 000 in 2011. Admissions for invasive pneumococcal disease increased from the 1990s reaching 4.45/100 000 for meningitis and 2.81/100 000 for septicaemia in 2006. A reduction in admissions followed the introduction of the PCV7 vaccine, and were 2.03/100 000 for meningitis and 1.12/100 000 for septicaemia in 2011.

Conclusions: Vaccine preventable paediatric invasive bacterial disease reduced substantially in England with the advent of effective conjugate vaccines. Ongoing disease surveillance and continued development of higher valency vaccines for pneumococcal and MenB disease remain important.

ESPID-0157

HELICOBACTER PYLORI INFECTION - THE EXPERIENCE IN A TERTIARY CENTER IN 2012

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Introduction**:** Helicobacter pylori infection is a common and universally distributed bacterial infection. It is predominantly acquired in childhood.
Objectives: The aim of this study was to asses the overall prevalence of this infection in a heterogenous group of patients that underwent upper gastrointestinal endoscopy for various reasons.
Methods: A retrospective study was conducted in „Grigore Alexandrescu" Emergency Children's Hospital from January to December 2012 regarding children who underwent upper gastrointestinal endoscopy. All children who had positive urease test were included in the study.
Results: A total of 426 children aged 4 months to 18 years (mean 11.6 years) had upper endoscopies. Of these, 320 children were tested for Helicobacter pylori. The overall prevalence of this infection in this heterogenous group of symptomatic children was 16% (69 cases). The four most common indications for upper endoscopy were recurrent abdominal pain 48 (69.5%), epigastric pain 8 (11.5%), vomiting 15 (21.73%) and upper gastrointestinal bleeding 4 (5.7%). Macroscopic aspect showed nodular aspect in 63 cases (91.3%) while 10 (14.4%) endoscopies revealed no changes.
Conclusions: This study shows that H.pylori positivity in a routine endoscopy population is low and does not appear to be associated with specific symptoms.

ESPID-0161

COMPARISON OF IMMUNOGENICITY AND SAFETY OF THREE HEPATITIS A VACCINES IN ADOLESCENTS

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Introduction

The overall incidence of hepatitis A infection is very low and adolescents are highly vulnerable to infection in Korea. Hepatitis A vaccine (HAV) was introduced in 1997 to Korea and recommended in high risk population. This study aimed to assess the immunogenicity and safety of hepatitis A vaccines in adolescents in Korea.

Methods

Three kinds of hepatitis A vaccines (A, B, and C) were immunized randomly in 142 hepatitis A virus naïve adolescents from 13 to 19 years of age, 6-12 months apart. Anti-HAV antibody titers were measured before and 30 days after the first and second dose of vaccine with electrochemiluminescence immunoassay (Cobas 8000 e602, Roche, Germany). Local and systemic adverse reactions were monitored.

Results

Seroconversion rates after the first dose of vaccine were 98%, 96% and 93% for Avaxim (A), Epaxal (B) or Havrix (C), respectively. After 2nd dose, seroconversion rates were 100% in all 3 vaccines. Anti-HAV geometric mean concentrations (GMCs) were 759.7 mIU/ml for A (95% confidence interval (CI): 563.5;1024.4), 256.8 mIU/ml for B (95% CI: 184.3;357.7) and 192.9 mIU/ml for C (95% CI: 129.6;287.0). GMCs increased to 7,207.7 mIU/ml (95% CI:6,023.1;8,684.7), 1,750.5 mIU/m (95% CI:1,362.9;2,248.3), or 1,953.5 mIU/ (95% CI:1,459.4;2,614.7) after two doses of vaccine A, B, or C, respectively. Local reactions were observed in 19.6% - 22.7% of subjects. Systemic reactions were observed in 0-2.0% of subjects.

Conclusions

Three hepatitis A vaccines showed excellent immunogenicity in Korean adolescents. They were well tolerated, too.

ESPID-0162

BIOLOGIC GUIDELINES IN ENTERITIS WITH ROTAVIRUS IN CHILDHOOD

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Introduction.Rotavirus enterocolitis (RVE) is perhaps the most atypical intestinal infection in children. In a while is discussed about increased levels of transaminase and/or decreased levels of mean platelet value (MPV) related with rotavirus infection (RVI). In due time, these analyses could reduce the incidence of nosocomial infection (NI).
Objectives and aims.To demonstrate how certain biologic markers can guide in RVI diagnosis.
Methods.Prospective study performed in hospitalized pediatric patients in 2013. Inclusion criteria: at least one of the following: fever, vomiting, loss of appetite, abdominal pain, dehydration; diarrhoea in the first 48 hours of admission; patients not RV previous vaccinated, without blood, pus, mucus in stools. All patients were investigated with transaminase, C-reactive protein (CRP), and platelet values. The rapid immunochromatographic test were performed in the first 48 hours of admission.
Results.The study group comprised 582 patients: 98 tested positive for rotavirus and 484 negative.The RV positive group features: mean age 10 months, higher incidence (45,91 %) of atypical symptoms; 7 cases presented adenovirus coinfection, 8 NI; 24 elevated transaminase, 42 elevated CRP and 16 decreased MPV; 43 were mild infection, 45 moderate, 10 severe.The results showed a very high significance between RVE and elevated serum transaminase (p 0.0002). At 0-12 months group, the inflammatory syndrome (IS) – RVE association had a high statistical significance (p 0.01), at the other groups only for severe cases (p 0.03).
Conclusions.The elevated serum transaminase and IS can guide a rapid suspicion of RVE, even in the absence of typical symptoms.

ESPID-0163

ASSOCIATION OF BRONCHOALVEOLAR LAVAGE YIELD WITH PULMONARY CONSOLIDATION IN CHILDREN WITH MYCOPLASMA PNEUMONIAE PNEUMONIA

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Background and aims Seldom reports on ingredients of lung consolidation in children with acute lobar pneumonia. We study the association of bronchoalveolar lavage yield with pulmonary consolidation in children with Mycoplasma Pneumoniae Pneumonia (MPP).

Methods Self-control method has been used for the study on prealbumin (PA), albumin (Alb), vascular endothelial growth factor (VEGF), pulmonary surfactant protein A and D (SP-A,-D) and HT?-56 in infected and non-infected BALFs in 34 children with single lung suffered from MPP approved by chest CT.

Results The contents of PA, Alb, VEGF, SP-A, SP-D and HT?-56 in infected BALF were [mg/L;mean±SD]:283.90±344.11,419.72±643.07,277.43±334.83,386.81±509.28,336.43±508.90,168.69±294.79; in non-infected BALF were: 101.96±111.66,168.00±274.35,96.47±103.29,157.97±211.04,107.24±144.77,47.16±92.93. The correlation coefficient of PA, Alb, VEGF, SP-A, SP-D and HT?-56 in infected and non-infected BALFs were: 0.644,0.729,0.666,0.775,0.881,0.773 (*P*?0.01).

Conclusions The levels of VEGF, SP-A, SP-D and HT?-56 in BALFs can reflect the injuries of vascular endothelium and alveolar epithelium. The contents of PA and Alb also can present the degree of exudation and consolidation of the infection in the lung tissue. The level of PA might be more sensitive than Alb in serum to imply alveolar-capillary injury and intra-alveolar exudation.

ESPID-0164

DIAGNOSTIC VALUE OF FLEXIBLE BRONCHOSCOPE IN CHILDREN WITH PULMONARY TRACHEOBRONCHIAL TUBERCULOSIS - REPORT OF FOUR CASES AND REVIEW OF LITERATURE

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Background and aims
Diagnosis of pulmonary tracheobronchial tuberculosis (PTBT) on the grounds of clinical and radiological findings in children is more difficult due to the lack of etiological confirmation. We aimed to elucidate the diagnostic value of flexible bronchoscopy (FB) for the children with recurrent or complicated pneumonia.

Methods
Four children confused with refractory pneumonia were examined with FB under general or local anesthesia. Bronchoalveolar lavage fluids (BALFs) obtained from the infected lesions were analysed for biochemical tests and sediments were used for anti-fast bacilli staining. Biopsies were performed with the consents of their parents.

Results
Pathological changes in our four children included mucosal and submucosal edema and hyperemia, tubercular-like nodules, caseous necrosis, fibrous hyperplasia. Positive results of acid-fast bacilli staining presented at tissue slices or BALF sediments.

Conclusions
FB played a critical role on the differential diagnosis PTBT from recurrent or complicated pneumonia with the advantaged of easy, safety, efficacy and effectiveness.

ESPID-0167

PNEUMOCOCCAL CONJUGATE VACCINE (NON-TYPEABLE HAEMOPHILUS INFLUENZAE (NTHI) PROTEIN D, DIPHTHERIA OR TETANUS TOXOID CONJUGATES) IN PREVENTION OF ACUTE OTITIS MEDIA IN CHILDREN: A COHORT STUDY

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Background: Acute otitis media (AOM) is a common diagnosis among children. In March 2009, a pneumococcal vaccine containing ten serotype-specific polysaccharides conjugated to *Haemophilus influenzae* protein D, tetanus toxoid, and diphtheria toxoid as the carrier proteins was developed and licensed.

Objectives: To compare the incidence of AOM among the children ages 2 months to 6 months old previously given 3 doses of Pneumococcal conjugate vaccine (PCV) and those who did not received the vaccine over a period of one year.

Study Design: Historical Cohort Study

Setting: Earnshaw Health Center, Sampaloc, Manila

Participant: A total of 176 subjects participated in the study. Exposed Group: children vaccinated with 3 doses of PCV. Unexposed Group: children not vaccinated with PCV.

Methodology: Medical records of both exposed and unexposed groups were reviewed. Both groups underwent history and physical examination including otoscopy and any sign and symptoms of active ear infection were noted.

Results: The overall incidence of AOM was 5.11% (9 out of 176). An incidence of 3.75% (8 out of 80) and 6.25% (6 out of 96) had AOM among the exposed and unexposed groups, respectively. A Chi-square test value of 0.165 (p value = 0.685) was obtained. The relative risk (RR) was computed at 0.6 (95 percent CI 0.155, 2.323). The number needed to treat (NNT) is 40.

Conclusion: The result showed no difference in the development of AOM in the two groups, however, PCV based on the relative risk is still beneficial in preventing AOM in children.

ESPID-0168

KL-6, SP-D, AND HTI-56 LEVELS IN THE SERUM AND BRONCHOALVEOLAR LAVAGE FLUID OF CHILDREN WITH MYCOPLASMA PNEUMONIAE PNEUMONIA

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Background and aims
The aim of this study was to evaluate the levels of KL-6, SP-D, and HTI-56 in the serum and bronchoalveolar lavage fluid (BALF) of children with *Mycoplasma pneumoniae* pneumonia (MPP).

Methods
This was a prospective self-controlled study of 32 children with MMP, which assessed the levels of KL-6, SP-D, and HTI-56 in the serum and infected and uninfected BALF. Patients were enrolled based on evidence of unilateral lung infection on high-resolution chest computed tomography.

Results
There were significant differences in the levels of KL-6, SP-D, and HTI-56 in infected BALF compared with the corresponding levels in serum and uninfected BALF ($P < 0.05$). There was no significant difference in the serum levels of KL-6, SP-D, and HTI-56 in serum compared with the levels in uninfected BALF ($P > 0.05$). There was a significant negative correlation between the serum level of KL-6 in serum and the level of KL-6 in infected and uninfected BALF ($P < 0.05$).

Conclusions
The serum KL-6 may be better than SP-D as a convenient and accurate biomarker indicating pulmonary infection and alveolar injury in children with community-associated pneumonia.

ESPID-0169

CO-EFFECTS OF STREPTOCOCCUS PNEUMONIA ON THE ULTRASTRUCTURES OF ALVEOLAR EPITHELIAL CELL TYPE ? AND HEPATOCYTE IN MICE WITH PNEUMOCOCCAL PNEUMONIA

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Background and aims
Lobar consolidation and/or necrosis of lung tissue and hypoalbuminumia often co-exist in children with pneumococcal pneumonia (PP). In order to find their connection, PP mice model was established to study on the ultrastructures of alveolar epithelial cell type ?(AEC-?) and hepatocyte.

Methods
The suspended solutions of Streptoccus pneumonia (*S.p*) strains (Serotype 19A) cultured from the blood of children with PP (0.3 mL, CFU: 1×10^8/L) were instilled into the trachea of pathogen-free mice to prepare PP model. The same amount of normal saline was given for control group (10 mice). The samples (1 mm^3) from the lower lobe of the right lung and liver of the mice were obtained 92 hr later and fixed in 2.5% glutaraldehyde and stored at 4 ?. A transmission electron microscope was employed for the examination of the ultrastructures of AEC-? and hepatocytes. The same *S.p* strains (Serotype 19A) was re-cultured from the experimental mice.

Results
Quantitative reduction and exfoliation of microvilli on the surface of AEC-? presented with enlarged size, enhanced evacuation and reduced density of lamellar bodies. The nucleoli of both AEC-? and hepatocyte showed inhomogeneous distribution of concentrated nucleolus chromatin. Mitochondria were swollen with crest broken in the cytoplasm of these two cells. The number of lipid droplets was obviously reduced with the rupture of rough endoplasmic reticulum in hepatocyte.

Conclusions
The injuries of AEC-? and hepatocyte infected by *S.p* involved in the process of pulmonary consolidation and hypoalbuminemia.

ESPID-0170

ANTIMICROBIAL PROPERTIES OF NEW ANTISEPTIC COMPOSITION

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Introduction. Accordingly to National Nosocomial Infections Surveillance (NNIS) data surgical square is contaminated with microorganisms, causing nozocomial infections, in 14-16% of cases. As a rule, micro-flora of wounds is represented by bacteria, their associations resistant to different antibiotics, antiseptics. That is why it is necessary to investigate antimicrobial wound dressings and suture materials for medical use.

Aims. To study antimicrobial properties of antiseptics and new antiseptic composition of decamethoxine and substantiate its use for prophylaxis and treatment of topical infectious diseases.

Methods. The antimicrobial activity of antiseptic composition with decamethoxine, carboxymethylamylum, oxyethylcellulose (later named as AC) and antiseptic medicines (decasan, chlorhexidine bigluconate, miramistine) against clinical strains of S. aureus (n130), E. coli (n120) was studied in the research.

Results. We found high antimicrobial properties of decamethoxine in AC. AC was active in minimal cidal concentrations (McC 1,10±0,86 mkg/ml) against S. aureus; E. coli (McC – 4,53±2,03 mkg/ml). We proved that decasan was active against strains of S. aureus (McC 1,45±0,81 mkg/ml); E. coli strains (McC 5,88±2,62 mkg/ml). Bactericidal activity of chlorhexidine bigluconati was lower according to S. aureus (McC 31,5±4,3 mkg/ml) and E. coli (McC 20,05±10,41 mkg/ml). Bactericidal activity of miramistine against S. aureus (McC 8,04**±**4,24 mkg/ml), E. coli (McC 14,93±14,47 mkg/ml) was alike chlorhexidine bigluconati.

Conclusion. Antiseptic composition with decamethoxine, carboxymethylamylum, oxyethylcellulose has high antimicrobial activity that is why it is perspective to use in clinical medicine for prophylaxis and treatment of topical infectious diseases.

ESPID-0171

ANTIBIOTIC SENSITIVITY OF E. COLI, ISOLATED IN CRITICALLY ILL CHILDREN WITH PURULENT-INFLAMMATORY DISEASES

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Background. Clinical strains of E. coli are known to cause nosocomial infections in pediatric practice (21,4 %). Treatment of nosocomial infectious diseases caused by E. coli is a difficult task because of microbial resistance to antibiotics. **Aime**. To study the sensitivity of clinically isolated E. coli strains to antibiotics.

Methods. In our study we researched the sensitivity of E. coli clinical strains (n=56), which were obtained from children with nosocomial infectious diseases, to antibiotics. All patients underwent treatment in intensive care unit. The sensitivity of E. coli strains was studied to 32 antibiotics, used in pediatric practice, by means of disc-diffusion test and method of serial dilutions.

Results. The results of the study reflect high resistance of E. coli to cephalosporins of 1st and 2nd generations (25-50 %), combined aminopennicillin with sulbactam (25 %), doxycycline (61,54 %). The sensitivity to aminoglycosides kanamycin (50 %), streptomycin (3,85 %), tobramycicn (3,85 %) generations was low or even absent. Amikacin was effective according to E. coli in about 70 % .

Obtained isolates of E. coli had alike good sensitivity to amoxicillin/clavulanate (84,62%) and piperacillin/tazobactam (86,54%). We found high antibacterial activity for some cephalosporins (ceftriaxone – 94,22%; cefepim – 98,08%). Widely used meropenem had high antimicrobial activity according Eschericchia (94,23 %), only 1,92 % of studied strains were resistant to this antibiotic.

Conclusions. These data says that some aminoglycosides, first generations of cefalosporins and even some combined antibiotics have a low antimicrobial activity, caused by microbial resistance to antibiotics. That is why previous microbiological determination of sensitivity of isolated bacteria, optimize individual strategy of antibiotic therapy in critically ill children.

ESPID-0172

PREVALENCE, INTENSITY AND TREATMENT COVERAGE FOR INTESTINAL SCHISTOSOMIASIS AMONG SCHOOL CHILDREN IN UGANDA: A CROSS SECTIONAL STUDY

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Introduction: Realization of the public health benefits of mass treatment for schistosomiasis depends on achieving and maintaining high annual treatment coverage. However, treatment coverage among school children in Uganda is low.

Objective: To estimated the prevalence and coverage of treatment for schistosomiasis among school children.

Methods: This was a cross sectional study carried out in Jinja district of Uganda where intestinal schistosomiasis is highly endemic. Prevalence and mean intensity of infection with *Schistosoma mansoni* were determined among random sample of 1,010 children in 12 primary schools. Coverage of praziquantel treatment at the last mass treatment was determined through self reports during face to face interviews with the school children.

Results: The mean age was 11.6 years (S.D 1.8). Females accounted for 55.0% (555). Coverage of praziquantel at last mass treatment was 28.2% 95% CI: 22.9%-33.6%). The overall prevalence of *S. mansoni* infection was 35.0% [95% CI: 32.1%-37.9%]. The overall intensity of *S. mansoni* infection was 116.1 epg [95% CI: 98.3-137.1]. Coverage of praziquantel treatment was more likely if a child was from a school with high prevalence of infection and had knowledge about schistosomiasis prevention. Of the 725 children who did not take praziquantel, 522 (72.0%) reported fear of side effects of the drug as a major reason for non-uptake.

Conclusions: Prevalence and intensity of intestinal schistosomiasis among this population is high. Coverage of praziquantel treatment is very low. Strategies are needed to increase treatment coverage among school children.

ESPID-0173

CLINICAL EFFICACY OF OUTPATIENT ORAL CLINDAMYCIN DOSING OF 30 MG/KG/DAY EVERY 8 HOURS FOR INVASIVE MUSCULOSKELETAL INFECTION IN CHILDREN

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Background and Aims: Guidelines for the treatment of invasive musculoskeletal infection (MSI) due to Methicillin-resistant *Staphylococcus aureus* (MRSA) in children recommend clindamycin 10–13 mg/kg/dose every 6 to 8 hours (40 mg/kg/day). This study evaluates the clinical efficacy of clindamycin at 30 mg/kg/day divided every 8 hours.

Methods: Children with MSI treated with outpatient clindamycin 2009-2013 were retrospectively studied. Dose, route, and duration of clindamycin, progression of disease requiring readmission, and additional surgical intervention were evaluated. Comparison of the total clindamycin usage of these children was made with recommended dosing guidelines.

Results: Among 242 children treated for MSI, 129 (53.3%) were discharged with outpatient clindamycin (IV - 2; oral – 127). The average dose and duration of treatment were 29 mg/kg/day (standard deviation – 6.5 mg/kg/day) and 34.6 days (standard deviation – 17.5 days), respectively. Eight children were treated with 40 mg/kg/day dosing and 121 received 30 mg/kg/day. There were 6 (4.7%) readmissions, but 4 were unrelated to antibiotic effectiveness. One child from each dosing subgroup was readmitted for perceived progression of disease requiring further surgical intervention. An additional 1.73 million mg of clindamycin would have been required to treat these children according to current guidelines.

Conclusions: This study supports outpatient oral clindamycin dosing of 10 mg/kg/dose every 8 hours for invasive MSI in children. We found an acceptably low rate of disease progression or readmission requiring additional surgical intervention among children treated with this dosing protocol. Consideration of higher dosing should still be given for children with severe illness.

ESPID-0174

RAPID IDENTIFICATION OF MYCOBACTERIUM TUBERCULOSIS COMPLEX AND NONTUBERCULOUS MYCOBACTERIA IN CHILDREN SPECIMENS BY AN OLIGONUCLEOTIDE CHIP

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Introduction. Mycobacterial infections in children have been a serious health problem, especially in developing countries. Pulmonary tuberculosis is the most common form, but there has been a steady increase in the number of cases of extra-pulmonary tuberculosis and nontuberculous mycobacterial infections. Rapid identification of *Mycobacterium tuberculosis* complex (MTBC) and nontuberculous mycobacteria (NTM) is of clinical importance. **Objectives**: Conventional culture methods for the isolation of mycobacteria are time-consuming and identification of different species of NTM can be difficult. **Aims**: To develop an oligonucleotide chip that could rapidly identify MTBC and 19 clinically relevant NTM species. The chip was then used to directly detect MTBC and NTM in clinical specimens from children. **Methods**: Specific oligonucleotide probes were designed from the rRNA gene internal transcribed spacer (ITS) region and immobilized on nylon membrane. The hybridization procedures consisted of PCR amplification of the ITS regions using universal primers, followed by hybridization of the digoxigenin-labeled PCR products to oligonucleotide probes on the chip. The hybridization signals were then revealed by reaction with enzyme-conjugated anti-digoxigenin antibodies. **Results:** The chip had a high sensitivity (98.8%) and specificity (98.6%) for identification of mycobacterial isolates. The chip was also useful for direct detection of mycobacteria in clinical specimens, including brain abscess, skin lesion and tissue biopsy. **Conclusions:** The current chip provides a rapid and accurate tool for diagnosis of mycobacterial infections in children. The turnaround time of the assay was around 6 h for clinical isolates, and was 24 h for clinical specimens.

ESPID-0175

RESPIRATORY SYNCYTIAL VIRUS PROPHYLAXIS IN DOWN SYNDROME: A PROSPECTIVE COHORT STUDY

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Background and Objective: Down syndrome (DS) children are at significant risk for respiratory tract (RTI) and respiratory syncytial virus (RSV) infection and related hospitalization. We compared hospitalization rates for RTI in DS children aged < 2 years who prospectively received palivizumab during the RSV season versus a previously published, similar untreated DS birth cohort.

Methods: 532 prophylaxed DS children were assembled from the prospective Canadian palivizumab registry (CARESS) between the years 2005-2012. The untreated group comprised 233 DS children derived from a Dutch, nation-wide birth cohort from 2003-2005. Events during the RSV seasons were counted. Demographics and risk factors were compared using t-test or chi-square where appropriate. Poisson regression analysis was performed to compare incidence rate ratios [95% CI] for both RTI and confirmed RSV hospitalization between the groups while controlling for observation length and known risk factors for severe RSV infection.

Results: In total, 31 (23 untreated, 8 treated) RSV-related hospitalizations were documented. The adjusted risk of RSV-related hospitalizations was higher in untreated subjects compared to palivizumab recipients (incidence rate ratio 3.63 [95% CI: 1.52-8.67], p=0.004). The adjusted risk for hospitalization for all respiratory tract infection (147 events; 73 untreated, 74 treated) was similar (incidence rate ratio untreated versus palivizumab 1.11 [0.80 – 1.55], p=0.53).

Conclusions: These results suggest that palivizumab is associated with a 3.6-fold reduction in the incidence rate ratio for RSV-related hospitalization in DS children aged <2 years. A randomized trial is needed to determine the efficacy of RSV immunoprophylaxis in this specific high risk patient population.

ESPID-0176

ACCURACY OF PEDIATRIC APPENDICITIS SCORE: A RETROSPECTIVE EVALUATION OF ACUTE APPENDICITIS AMONG PATIENTS ADMITTED AT A TERTIARY HOSPITAL IN QUEZON CITY (JANUARY 2003 – DECEMBER 2012)

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Introduction Acute Appendicitis is the most common cause of acute surgical abdomen in children. Signs and symptoms of acute appendicitis in children are non-specific.
Objective To determine accuracy of Pediatric Appendicitis Score (PAS) by comparing patients' scores with their post-appendectomy histopathology findings.
Methods This is a retrospective cohort study. Charts of pediatrics patients admitted at the tertiary hospital at Quezon City (January 2003-December 2012) that underwent appendectomy were reviewed. Excluded were charts with incomplete data. Descriptively, data were tabulated using percentage frequency distribution and PAS' result of the subjects were assessed and computed for its sensitivity, specificity, and predictive values.
Results A total of 55 charts were reviewed. The highest percentage of acute appendicitis prevalence was seen in 2006. Majorities were males and mean age of 9 years old. 52.40% came from Quezon City. Most of the patients presented with migrating abdominal pain. Laboratory results revealed leukocytosis with neutrophil predominance. 51% had score of $\geq$ 8. Histopathology results revealed 94.5% positive appendicitis. The PAS was correlated with histopathology results and revealed sensitivity of 53.8%, specificity of 100%, positive predictive value of 100% and negative predictive value of 11.1%.
Conclusions We have reviewed a total of 55 acute appendicitis cases with male predominance and mean age of 9 years old. Mostly, patients came with migrating abdominal pain. Half of them had Pediatric Appendicitis Scores of $\geq$ 8. The PAS has specificity and positive predictive value of 100% making it a good indicator for ruling in acute appendicitis if PAS $\geq$ 8.

ESPID-0177

EARLY DIAGNOSIS OF ATYPICAL PULMONARY TUBERCULOSIS IN 18 CHILDREN

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Abstract: **aims**: To investigate the clinical characteristics and early diagnostic methods of atypical pulmonary tuberculosis in children. **Methods**: Clinical diagnostic processes in 18 cases with childhood atypical pulmonary tuberculosis were analyzed retrospectively. **Results**: There were 12 cases be diagnosed through chest high resolution CT (66%), 10 cases be diagnosed through T-SPOT.TB (55%) and 8 cases be diagnosed through flexible bronchoscopy (44%). **Conclusions**: The clinical characteristic of childhood pulmonary tuberculosis is always atypical and diversiform. Diagnostic methods must be selected early and combined to use to improve confirmed diagnostic rate.

Key words: Childhood; Atypical pulmonary tuberculosis; High resolution CT; T-SPOT.TB; Flexible bronchoscopy

ESPID-0179

EVENTS RELATED TO THE IMMUNIZATION PROGRAM RECORDED AT THE VACCINE INFORMATION SYSTEM (SIV) OF VALENCIAN COMMUNITY (SPAIN): 2012 AND 2013

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Background and aim: Programmatic errors (PE) related to the vaccination are defined as no voluntary errors in the storage, handling, or administration of vaccine. Adverse events due to programmatic errors are common. The utility "Report of programmatic errors" of the SIV was implemented in 2012 and designed to facilitate reporting so that appropriate action can be taken and in order to improve immunization programmes.

Aim: to asses PE reported to SIV in Valencian Community during 2012 and 2013.

Methods: A retrospective study of PE reported to SIV from February 2012 to November 2013 has been done. Variables: type of PE, vaccine and age.

Results: A total of 305 PE were reported (rate 8.96 per 10^5 administered vaccines).

Causes of PE were: 20 expired data vaccine, 36 out of the vaccination recommendation, 32 extra doses administered, 189 other causes (vaccine without reconstitution and others).

141 PE (other causes) were out of the definition (rate wrong registry 46.2 per 10^2)

164 PE accord to the definition (rate right registry 4.8 per 10^5), 45% registered in men. 69.5% PE in people aged <15 years (42.7% <1 year).

Vaccines with the highest reporting rate were paediatric hepatitis A (rate 146.5 per 10^5) and hexavalent vaccine (rate 32.8 per 10^5).

Conclusions: The rate of report of PE is low. The highest reporting rate corresponds to the paediatric hepatitis A. People aged <1 year have the highest number of reports. Information and training of healthcare workers about the utility of the SIV has to be improve.

ESPID-0180

TRENDS IN VARICELLA IMMUNIZATION COVERAGE IN CHILDREN AGED 1-2 AND 11-12 YEARS FROM 2004 TO 2012. VALENCIAN COMMUNITY (SPAIN)

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Background and aim:

Varicella is a common childhood disease. It is usually mild, but it can be serious, especially in adults. Varicella vaccination in Valencian Community (VC) is free of charge in teenagers aged 11-12 and risk groups since 2006, despite this fact paediatricians recommend varicella vaccine in toddlers.

The aim of the study was to determine varicella immunization coverage during the study period (2004-2012) in Valencian Community.

Methods:

A retrospective descriptive study of varicella immunization coverage in children aged 1-2 (1st dose) and 11-12 (1st dose) years from 2004 to 2012 has been done.

Vaccinated data were obtained from the Vaccine Immunization System (SIV). All administered vaccines are recorded in the SIV of VC.

Study variables: age, coverage, vaccine, year.

Results:

166 082 varicella vaccine doses were recorded in SIV. There were a mean of 538 431 children aged 1-2 years during the study period (mean 53 843 each year), the average coverage was 30.84%. Varicella vaccination coverage oscillated from 4.69% (2004) to 53.41% (2012).

*3*3 924 doses were administered in teenagers during the study period (47 840 mean teenagers aged 11-12 each year), average coverage 7.21%(from 0.07% to 11.17%).

Table1.

Table 1. Varicella coverage by age. Valencian Community. 2004-2012.

Coverage by age	2004	2005	2006	2007	2008	2009	2010	2011	2012
1-2 years	4.69%	13.76%	22.60%	31.43%	39.12%	39.29%	42.83%	49.54%	53.41%
11-12 years	0.07%	0.31%	7.71%	9.71%	9.79%	10.30%	10.36%	10.39%	11.17%

Conclusions:

Varicella coverage in children aged 1-2 and 11-12 has increased during the study period.

Coverage in teenagers since 2007 was according to the varicella epidemiology.

Coverage in children aged 1-2 years produces incertitude from the point of view of public health.

ESPID-0181

AUDIT ASSESSING THE HIV ANTIBODY TEST RESULTS OF CHILDREN BORN TO HIV-POSITIVE MOTHERS AT A SPECIALIST CENTRE IN MANCHESTER, UK

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Introduction

HIV testing in children born to HIV-positive mothers remains critical to ensuring early detection. Testing is routinely performed at 18-24 months to confirm the absence of vertical infection. However, it has been recognised that positive or equivocal results may occur due to the increased sensitivity of HIV tests in detecting maternal antibodies.

Aims

This study aimed to assess the HIV antibody results at a Paediatric Infectious Diseases unit in Manchester.

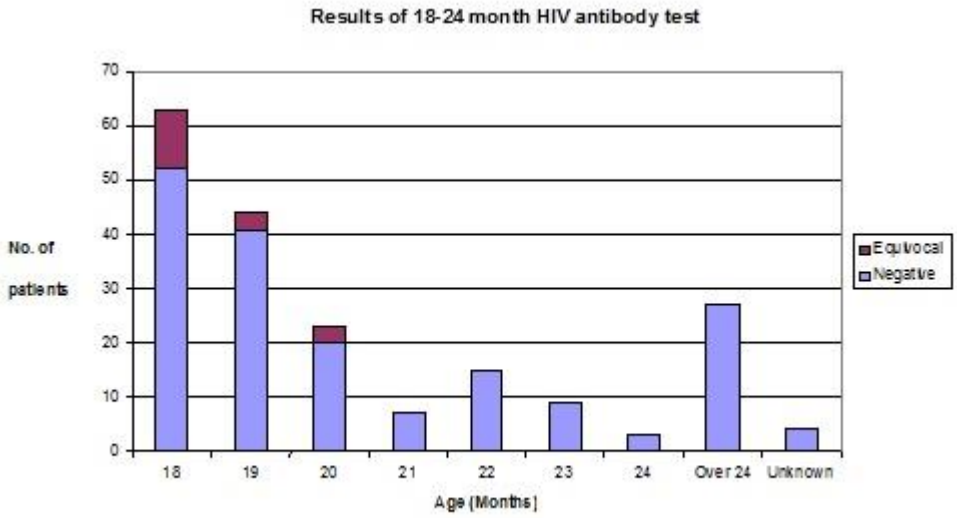
Methods

A retrospective audit including children born to HIV-positive mothers from January 2007 to September 2013 at Pennine Acute Hospitals NHS Trust. HIV antibody tests performed and their results were documented for each patient.

Results

193 children had HIV antibody tests performed between 2007 and 2013. 178 (92%) were negative and 15 (8%) were equivocal. All 15 patients receiving an equivocal result were between 18-20 months of age, with 17% of tests performed at 18 months

resulting in an equivocal result.



Conclusion

This study revealed a high rate of equivocal results in patients between 18-20 months of age, resulting in repeat testing and distress which may be avoidable if the test had been performed at a later age. We, therefore, recommend that HIV antibody tests are performed after 20 months to avoid the occurrence of equivocal results.

Acknowledgements

Many thanks to Sheila Norris, Cynthia Murphy and Donna Hudson.

ESPID-0182

PROLONGED SHEDDING OF ROTATEQ® VACCINE STRAINS IN PREVIOUSLY HEALTHY CHILDREN HOSPITALIZED FOR RESPIRATORY TRACT INFECTION

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RotaTeq® is an oral pentavalent live-attenuated human-bovine reassortant rotavirus (RV) vaccine. Previous studies have shown that vaccine type viruses may be shed in stools, and the shedding may sometimes be prolonged (>14 days). The aim of this study was to investigate the presence of RotaTeq® vaccine strains in previously healthy children hospitalized for respiratory tract infection (RTI).

A prospective study was conducted from September 2009 to August 2011 in Tampere University Hospital. A total of 547 stool samples were collected from children admitted to outpatient clinic or hospitalized for RTI. Stool samples were studied for RV by RT-PCR and nucleotide sequencing of the gene segments encoding for VP7, VP4 and VP6 antigens. Duration of shedding was calculated from the latest RV vaccination date.

Of the 557 children, 35 (6.3%) were RV VP7 positive in their stools. Of these 31 infants, aged 2-8 months, were detected with RotaTeq® vaccine strain VP7 antigen and 4 with wild-type rotavirus VP7 antigen. Fourteen (45%) infants with vaccine type VP7 had received one dose, 11 (35%) two doses and 6 (19.4%) three doses of RotaTeq® vaccine before admission to hospital. The duration of shedding was over 14 days in 17 cases (55%) and over 30 days in 10 cases (32%); the longest shedding was detected 84 days after the third immunization.

Shedding of RotaTeq® vaccine strains is common and may be prolonged in previously healthy recipients of RotaTeq® vaccine. Further studies are needed to determine the prevalence of shedding and possible transmission to contacts.

ESPID-0183

NEONATAL GRAM-NEGATIVE LATE-ONSET SEPSIS: INCIDENCE, CLINICAL CHARACTERISTICS, AND RISK FACTOR FOR ADVERSE OUTCOME

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Introduction: Gram-negative late-onset sepsis (LOS) has become an increasing problem in the neonatal intensive care unit (NICU).

Objective and aims: To identify the incidence, clinical characteristics, and risk factor for adverse outcomes in neonates with gram-negative LOS.

Methods: All patients with gram-negative LOS from the NICUs of a tertiary-level Taiwan hospital over an 8-year period were enrolled. A case-control-control study was performed to evaluate risk factors for acquisition of gram-negative LOS.

Results: Of 5010 neonates, 290 (5.8%) had a total of 346 episodes of gram-negative LOS (36.7% of total LOS), and the incidence rate was 13.6 per 10,000 neonate-hospital days. Gram-negative LOS is associated with a higher severity of illness, a higher rate of infectious complications and sepsis-attributable mortality when compared with gram-positive LOS. The overall mortality rate was 17.6% (51/290), and sepsis attributable mortality rate was 9.8% (34/346 episodes). After multivariate logistic regression analysis, neonates with prolonged use of total parenternal nutrition (adjusted odds ratio [OR]: 1.53; 95% confidence interval [CI], 1.02-2.29; *P*=0.041) was independently associated with acquisition of gram-negative LOS. The independent predictors of in-hospital mortality were *Pseudomonas* LOS (OR: 11.45, 95% CI: 2.83-46.24), and underlying secondary pulmonary hypertension (OR, 18.02; 95% CI: 3.28-98.89), renal disease (OR, 17.16; 95% CI: 2.96-99.38) and neuromuscular comorbidities (OR, 2.72; 95% CI: 1.06-7.00).

Conclusion: Given the increasing incidence of gram-negative LOS in the NICU and its associated higher illness of severity and sepsis-attributable rate, strategies to reduce gram-negative LOS and its medical toll need to be addressed urgently.

ESPID-0184

"FIRST-LINE" ANTIMICROBIAL RESISTANCE AMONG E. COLI INFECTED URINARY TRACT ISOLATES IN CHILDREN

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Purpose: Urinary tract infection (UTI) is one of the most prevalent infectious diseases in the United States. Among uropathogens *Escherichia Coli* (*E. Coli*) accounts for 75% to 95% of UTIs which reported to have increase in resistance to commonly prescribed 'first line' antibiotics. The possibility of the emergence of resistant organisms in children is of concern because there is fewer treatment options available to them compared to adults. Aim: The goal of this study was to characterize the susceptibility patterns of uropathogens, particularly, *Escherichia Coli* (*E. Coli*), in pediatric patients with UTI in a community. Method: The study employed a retrospective cross-sectional chart review. Results: In 2012 there were 16,185 urine samples collected for culture of which 5,907 specimens were positive. Among uropathogens *E. Coli* accounted for 77%, followed by *Klebsiella pneumoniae* 12%, *Proteus mirabilis* 5%, and *Pseudomonas aeruginosa* 3%. About 13% (N= 577) of urine samples those tested positive for *E. Coli* were patient under nineteen years of age. Most children diagnosed with UTI were either in primary care office or in emergency room. Among *E. Coli* isolates, 45.8% isolates were resistant to ampicillin, 35.2% to ampicillin/sulbactum, 20.5% to trimethoprim-sulfamethoxazole, and 7.6% to cefazolin. Ampicillin and trimethoprim-sulfamethoxazole resistance were found to be more common in outpatient care setting while intravenous cefazolin resistance was seen more in inpatient pediatrics. Conclusion: This study may potentially serve as a guideline in reviewing existing antibiotic prescription pattern in order to better determine optimal empiric antibiotic selection by specialty care providers.

ESPID-0185

ACCEPTABILITY OF THE NEW MENINGOCOCCAL B VACCINE AMONG PARENTS OF INFANTS IN ITALY: A SURVEY

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Background and aims: A new meningococcal serogroup B (MenB) vaccine has been recently licensed. This study assessed the acceptability of MenB vaccine among parents.
Methods: We performed a cross-sectional survey on a random sample of parents of infants presenting for the hexavalent vaccination from May to July 2013 in Milan. A self-administered questionnaire covered sociodemographics, knowledge about meningitis and vaccine prevention, the perceived benefits of vaccination and the willingness to receive the MenB vaccine.
Results: 1842 parents (76.7% caucasian, 23.3% non Caucasian) responded to the survey. 64.4% of parents wanted their child to receive MenB vaccine, 30.5% didn't express any opinion and only 5.1% stated that they would not vaccinate their sons. At multivariable analysis, the awareness of outcomes of meningitis (very high vs low OR=2.3; p< 0.0001), the perceived benefits of vaccination (very high vs low OR=6.4; p< 0.0001) and the knowledge of a previously licensed MenC vaccine (OR=1.4; p= 0.0063) were strongly associated to the willingness to receive MenB vaccine. A fair self-reported knowledge about meningitis was also associated with the willingness to receive MenB vaccine (fair vs low OR=1.3;p=0.0474). On the contrary being graduated (university vs basic education OR=0; p= 0.0005) was associated with the refusal of immunization. Among parents willing to vaccinate their sons, 66.9% would like to accept 3 injections at the same visit whereas 11.3% would not, 21.8% didn't express any opinion.
Conclusions: The acceptability of MenB vaccine was high. Increasing knowledge about meningitis and vaccine prevention might increase the acceptability of this vaccine.

ESPID-0186

ATTITUDE TOWARDS VACCINATION AND VACCINATION COVERAGES IN HEALTH CARE WORKERS AND MEDICAL STUDENTS

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Background: Vaccine-preventable disease outbreaks in hospitals are frequent. Adequate vaccination coverages in health care workers (HCWs) are essential to interrupt transmission.

Aims: To assess attitudes towards vaccination and vaccination coverages among HCWs (nurses and trainees in paediatrics) and medical students (MS), attending the Paediatric Department of a University Hospital.

Methods: Anonymous participation of HCWs and MS to a questionnaire, between September 3rd -October 31st 2013..

Results: In total 132/328 (40.2%) respondents participated; 89 (67.4%) nurses, 21(15.9%) trainees and 22 (16.7%) MS

Over 95% of participants answered that vaccination is beneficial for the individual and the community. Confidence in vaccination overall, in vaccine-safety, and in benefit-risk ratio of vaccines were 89%, 93%, and 92%, respectively.

HCWs in paediatrics should be vaccinated against Hepatitis B, Tetanus, Pertussis, Polio, Rubella, Mumps, and Flu according to ≥75% (79-96%) of participants. In contrast, vaccination against Measles, Hepatitis A, Meningococcus C, and Varicella was only found necessary by 73%, 70%, 66% and 39% of participants, respectively.

Self-reported vaccination rates were: Tetanus 96%, Hepatitis B 93%, Polio 88%, Pertussis 80%, Diphteria 80%, Rubella 78%, Measles 68%, Mumps 67%, Hepatitis A 61% and seasonal flu 62%. For Meningococcus C, *Haemophilus influenzae B*, *Streptococcus pneumoniae* and Varicella the self-reported vaccination rates were <=43%.

Of those vaccinated against seasonal flu, 95% reported annual vaccination.

Conclusions: HCWs in a Paediatric Department of a University Hospital have a positive attitude towards and high confidence in vaccination. Self-reported vaccination rates were higher than previously reported. Coverage for seasonal flu should be increased.

ESPID-0187

URINARY TRACT INFECTIONS IN CHILDREN WITH URINARY TRACT AND/OR KIDNEY PATHOLOGIES AND THE EFFECT OF ANTIBIOTIC PROPHYLAXIS ON BACTERIAL RESISTANCE

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Urinary tract infections (UTI) are common bacterial infections in children. Antibiotic therapy is mandatory but may lead to resistant bacteria.

We evaluated positive urine cultures (≥ 100.000 CFU) during 2011- 2012, compared bacterial specimens and resistance patterns of children with and without UTKP and analyzed the effect of antibiotic prophylaxis (AP) on bacteria cultivated from break-through infections in children with UTKP taking AP.

470 positive urine cultures were analyzed (female 87%; mean age 7,4 years, range 1 month - 18 years). 103 patients (22%) had UTKP. 76% of bacteria were EC, 5% Proteus ssp., 4,3% Pseudomonas ssp., 4% Klebsiella ssp., 3,5% Enterococcus ssp. and 7,2% others. Children with UTKP had more non EC infections (n=44, 43%) than children without UTKP (n=72; 20%), RR 2.2 (CI 95%; 1.6- 2.9, p<0.0001). More EC were resistant to ampicillin and/or sulfamethoxazole/trimethoprim in children with UTKP (37%) than in children without UTKP (27%). Multiresistant EC (≥ three resistances) were found in 12% of UTKP and in 4% without UTKP, RR 1.52 (CI 95%; 1.12- 2.07, p= 0.0071). 16 children with UTKP developed UTI despite cefaclor prophylaxis. In 69 % (n= 11) non EC, mainly Pseudomonas ssp., was found and 31% (n= 5) EC, sensitive to cefaclor where cultivated.

Children with UTKP are at increased risk for UTI caused by resistant EC strains or by non EC bacteria. In break- through UTI of children with UTKP, on AP, a further selection towards non EC bacteria but no induction of resistance in EC was observed.

ESPID-0188

CORRELATIONS BETWEEN SURVEILLANCE CULTURES AND LATE-ONSET SEPSIS OF GRAM-NEGATIVE BACILLI IN NEONATAL INTENSIVE CARE UNIT

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Introduction and Aims

Late-onset sepsis (LOS), especially that of Gram-negative bacilli (GNB) is one of the greatest concerns in neonatal intensive care units (NICUs). Therefore we conducted this study to elucidate the correlations between LOS caused by GNB and colonizations outbreak revealed by routine surveillance cultures from neonatal patients in NICU of a Children's Hospital in Japan.

Methods

We collected the culture data and medical charts of our NICU from April 2007 to June 2013, respectively. Specimens of surveillance cultures were mainly respiratory. We defined "colonization outbreak" as the cumulative number of a specific GNB more than +1.5 SD. And also "outbreak period" was defined as 3 consecutive months after the "colonization outbreak". Then we compared the frequency of LOS caused by GNB between outbreak periods and non-outbreak periods.

Results

During 75months of the study period, several colonization outbreaks were observed, and some associations between these outbreaks and LOS caused by the same species of GNB (namely *Burkholderia cepacia*, *Klebsiella oxytoca* and *Enterobacter cloacae*) were found. But for other bacteria, such as *Escherichia coli, Serratia marcescens* and *Pseudomonas aeruginosa*, these correlations were not obvious.

Conclusions

We conclude that routine surveillance cultures may provide useful informations for the management of LOS in NICUs.

ESPID-0190

ANTIBIOTIC USE FOR CHILDHOOD URTI IN SAUDI ARABIA

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Introduction and Aims - Assess appropriate use of antibiotics for URTI in Saudi children

Methods - A Medline search covering 2000-13 with the following research terms: 'upper respiratory tract infections children Saudi Arabia' , 'sinusitis...' 'Tonsillitis...', 'pharyngo-tonsillitis...', 'antibiotic use in upper...'. After excluding overlapping articles, those related to viral or fungal infections, case reports, 8 papers were considered.

Results- In an urban setting, pediatric ED visits for RTI were the most frequent (68.1%) with URTI being the key diagnosis (53.9%) . Among patients in health centers, 87% of prescriptions related to URTI included antibiotics (El Gilany 2000) and the commonest diagnosis in all ages for which antibiotics were administered (43.8%) were URTI (Irshaid at al 2004). Al Enezi (2011) reported prescribing behavior of physicians. Majority of doctors (71.4%) stated that they advise patients on symptomatic medication, although 80 % reported pressure from patients for antibiotics at least once in the previous month. A study involving 352 parents of Saudi children by Al Dossari, (2013) concluded that parental self-medication is attributable to access to antibiotics without need for prescription and limited knowledge about antibacterial resistance.

Conclusions. The benefits of the national protocol (AlKhaldi YM *et al* 2001) seem to have faded. The recommendations put forward by all Authors underscore the need for health education on antibiotic usage, improvement of doctor-patient communication, a stringent policy of over the counter availability of antibiotics. Parents' expectations and health education need to be addressed, targeting less educated mothers (Saeed AA et al 2000).

ESPID-0192

DIFFERENTIAL DIAGNOSIS OF RESPIRATORY VIRUSES, BY USING RRT-PCR, DURING INFLUENZA VIRUS PANDEMIC A(H1N1)PDM09 IN SÃO PAULO, SP, BRAZIL

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During influenza pandemic 2009 a total of 52.929 respiratory secretions collected from patient presenting influenza – like illness were sent to Institute Adolfo Lutz (IAL) towards to investigate infection by the new influenza strain. A total of 31.757 (60%) presented negative results for influenza virus A(H1N1), A(H1N1)pdm09, A(H3N2) and B strains by CDC rRT-PCR. The objective of this retrospective study was to investigate the diversity of etiologic agent involved in influenza like syndrome by selecting the negative samples collected from suspected cases of influenza A (H1N1) pdm09 infection.

Material and Methods

A total of 1695 respiratory secretions presenting negative results by using CDC real time RT- PCR –CDC protocols; and were also proven negative by differential diagnosis (Influenza A, Influenza B, respiratory syncytial virus (RSV), parainfluenza 1, 2, 3 (PIV1, PIV2, PIV3) and adenovirus (ADV) by using differential monoclonal respiratory panel by using Indirect Immunofluorescence (IFI) were maintained at freezer -80°C in the Respiratory Virus Laboratory IAL. A total of 156 frozen archival nasopharyngeal aspirates selected by epidemiologic weeks were investigated.

Results

Of the 156 clinical specimens presenting negative results by using differential monoclonal respiratory panel IFI 132(85%) were positive for at least one virus including: 62 rhinovirus (RVs)(47%); ADV 27(20%); RSV 17(13%); PIV3 14(11%);11 human metapneumovirus (hMPV) (8%); PIV1 1(1%), 25(19%) were positive for more than one virus and 24(15%) were negative.

Conclusion.

The present study demonstrates the high incidence of RVs infection responsible for the clinical symptoms of influenza like syndrome during influenza A (H1N1) pdm09 strain emergence.

ESPID-0193

PERTUSSIS ON THE RISE - DYNAMIC CHANGES IN ISRAEL'S PULSE FIELD GEL ELECTROPHORESIS PROFILES

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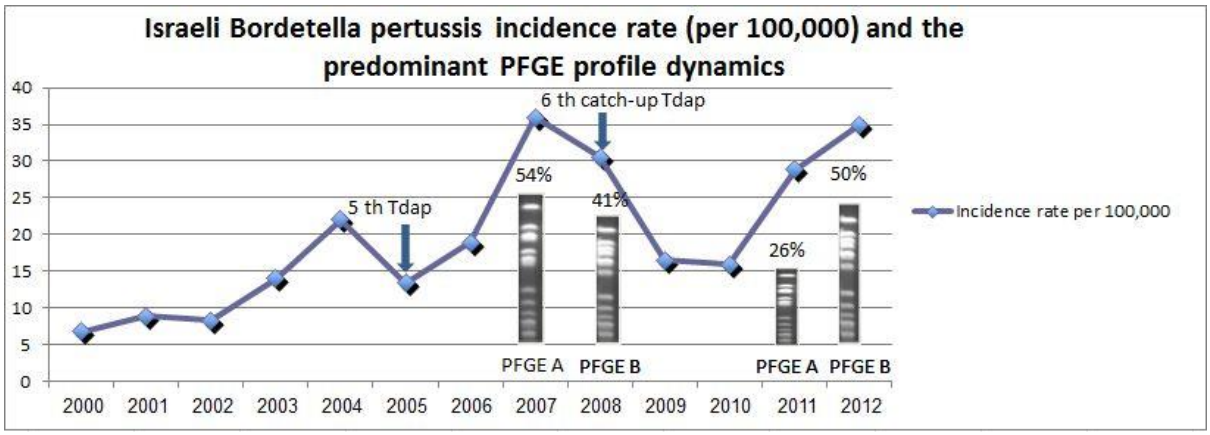
Background: Bacterial genetic drift is thought to prompt the emergence of new strains. We described two dominant, closely related pulse field gel electrophoresis (PFGE) profiles, 2007-2008, named A and B. Profiles C and D were also identified. The predominant PFGE profile A, had the same PFGE cluster as the dominant European strain, 1999- 2004 (PFGE cluster IVβ), whereas profile B was identical to cluster IVα.

Aim: To analyze select circulating pertussis isolates utilizing PFGE during the high incidence rate years, 2009-2012, one year after the initiation of the sixth catch-up dose.

Methods: PFGE utilizing the *Spe*I restriction enzyme on 38 pertussis isolates.

Results: Several PFGE restriction patterns from 2009-2012 were identified and referenced to our 2007-2008 profiles. Profile A decreased from 54% (n=44) to 26% (n=10), $p<0.006$, whereas B increased from 41% (n=34) to 50% (n=18), $p>0.43$, respectively. Profiles C and D disappeared and new profiles, E (n=2, 5%), F (n=1, 3%), G (n=3, 8%), H (n=1, 3%), and I (n=2, 5%) emerged.

Conclusions: A significant decrease in the frequency of PFGE profile A (cluster IVβ) and an increase in B (cluster IVα) following the implementation of additional vaccine doses occurred. New PFGE profiles emerged. Similar profile dynamics have also been described in Europe. Studies should explore whether this genetic drift may be prompted by the recent vaccine selection pressure.


Israeli Bordetella pertussis incidence rate (per 100,000) and the predominant PFGE profile dynamics
40
35
30
25
20
15
10
5
0
6 th catch-up Tdap
5 th Tdap
54%
41%
26%
50%
PFGE A
PFGE B
PFGE A
PFGE B
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
Incidence rate per 100,000

ESPID-0194

INCIDENCE OF INFLUENZA VIRUS INFECTION AMONG CHILDREN UNDER 5 YEARS OF AGE IN SÃO PAULO, SP, BRAZIL: INFLUENZA SEASON 2013

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Background and aim

Influenza virus surveillance has been improved in Brazil since the experienced pandemic outcomes affecting mainly children under 2 years old. The aim of the present study was to identify the incidence of influenza virus infection in different children age groups under five years old.

Material and Methods

During influenza season 2013 a total of 5503 nasopharyngeal specimens , collected from children under 5 years old with influenza like illness, were sent to Institute Adolfo Lutz (IAL) by influenza Sentinel Hospitals and Public and Private Health Services. Nasopharyngeal specimens collected from January through December 2013 were submitted to CDC rRT-PCR towards to identify influenza virus infection.

Results

From the 5503 investigated samples 527(9.57%) were positive by rRT-PCR, the following influenza virus strains has been identified: H3 strain 41(8%); B strain 229(43%); A (H1N1) pdm09 strain 257(49%). The highest incidence of influenza infection was observed into 7 m – 1 yo age group 190(36%), following: 2 yo – 3 yo age group 113 (22%); 2 m – 6 m yo group 94(18%); 4 yo – 5 yo age group 97(18%). The lowest incidence was observed into 0 -1 m age group 33(8%). This investigation also demonstrates similar incidence between 2 m – 6 m yo and 4 yo – 5 yo.

Conclusion

Taking into account that children under 5 years of age are at risk of developing serious complications, from influenza infection, the information's generated by this investigation will contribute with public health authority's decisions towards the prevention and control of the disease in Brazil.

ESPID-0196

VALIDATION STUDY OF BEDSIDE PREDICTION SCORING MODEL FOR LATE ONSET NEONATAL SEPSIS

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Background: Late-Onset Neonatal Sepsis (LONS) or Nosocomial sepsis has a high burden of illness with significant cause of mortality and morbidity. Diagnosis has to be done immediately using point-of-care tests for definitive management. **Objective:** To validate Bedside Nosocomial Sepsis Scoring developed by Okascharoen in 2005. **Methodology:** All neonates admitted in PGH NICU with suspicion of LONS were eligible for inclusion. Baseline data were obtained and analyzed. Subjects were scored based on Okascharoen system. Growth of organisms on blood culture is considered positive outcome and is considered Confirmed sepsis. **Results:** A total of 119 subjects were included in the analysis with 59 Confirmed Sepsis and 60 LONS negative. Baseline characteristics were similar between groups. Confirmed sepsis group has more events of hypotension/poor perfusion (p 0.001; -0.141, -0.438), thrombocytopenia (p 0.000; -0.169, -0.489), and prolonged umbilical-catheter-usage (p 0.014; -0.051, -0.311). The ROC curve has an AUC is 0.753 (p <0.001; 0.664-0.842), which means a randomly chosen neonate with LONS will have a higher predicted score than a neonate without LONS. A cut of score of 5 delineates high-risk from low-risk groups, with sensitivity of 83.3% and specificity of 61%. A neonate who scored >5 has 68.5% probability of having LONS while a neonate who scored ≤ 5 has 78.3% probability of having no LONS. A score >5 on a suspected neonate increases the probability of LONS from 50.4% to 68.6% whereas a score ≤5 decreases it from 50.4% to 21.8% **Conclusion:** This score is a valid clinical tool that can be used for the prediction of LONS.

ESPID-0198

AWARENESS OF NATIONAL HIV TESTING GUIDELINES AMONGST PAEDIATRICIANS IN ENGLAND AND WALES

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Introduction

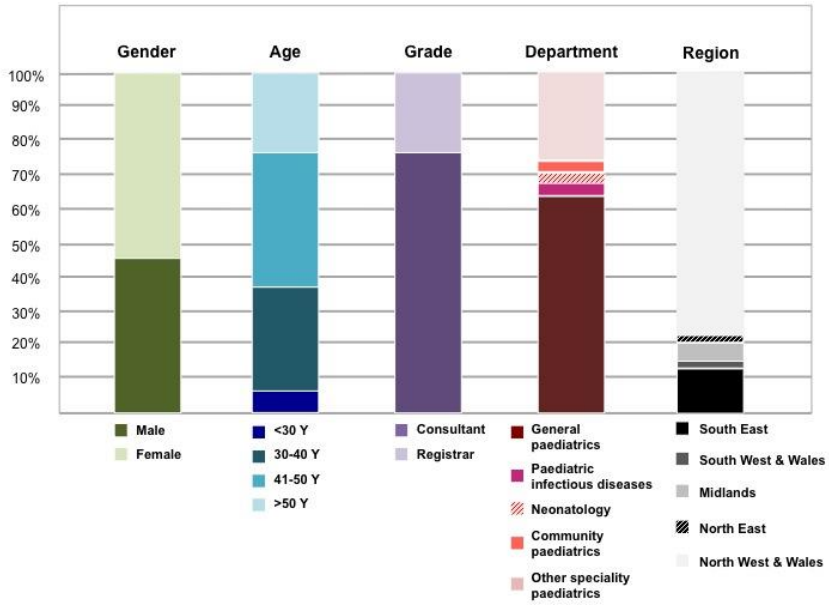
To prevent the presentation of infants and children with advanced HIV disease it is recommend that clinicians have a high index of suspicion for those who could be identified as being at risk.

Aims

This project aimed to evaluate the awareness and impact of several UK National Guidelines for HIV Testing amongst paediatricians.

Methods

A questionnaire was sent randomly to 305 clinicians working within general or specialist paediatrics in England and Wales, 120 (39%) of them responded. Questions included the clinician's demographics and their awareness of current HIV testing guidelines.



Results

Figure 1 – Demographics

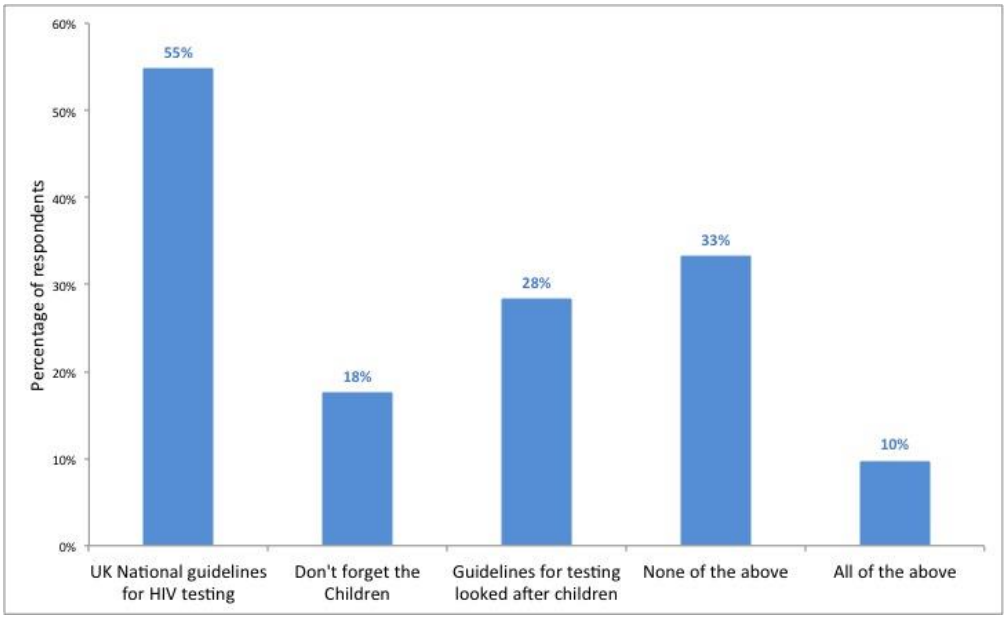


Figure 2 – Awareness of guidelines related to HIV testing in children.

Conclusions

The results overall were disappointing. As many as 33% of paediatricians (76% of them consultants), who participated in this project were unaware of any of the three key guidelines for HIV testing of children and only 55% were aware of the UK National Guideline for HIV Testing 2008.

In order for guidelines to be integrated into clinical practice, clinicians must be aware of the National Guidelines and willing to adapt their clinical practice according to current evidence-based recommendations. This could be addressed through a number of techniques including schemes such as:

· Organising workshops to raise awareness of relevant Guidelines led by an infectious diseases specialist.

· Revalidation penalties or financial incentives based on adherence to current guidelines

ESPID-0199

DO PAEDIATRICIANS IN ENGLAND AND WALES OFFER HIV TESTING WIDELY?

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Introduction

The UK National Testing Guidelines 2008 provide a list of paediatric patient groups, who should be considered for HIV testing.

Aims

We assessed the acceptability of testing these groups amongst paediatricians.

Methods

An online questionnaire was sent randomly to 305 general or specialist paediatricians with 120 (39%) respondents. Questions included clinician's demographics and an evaluation of various patient groups.

Results

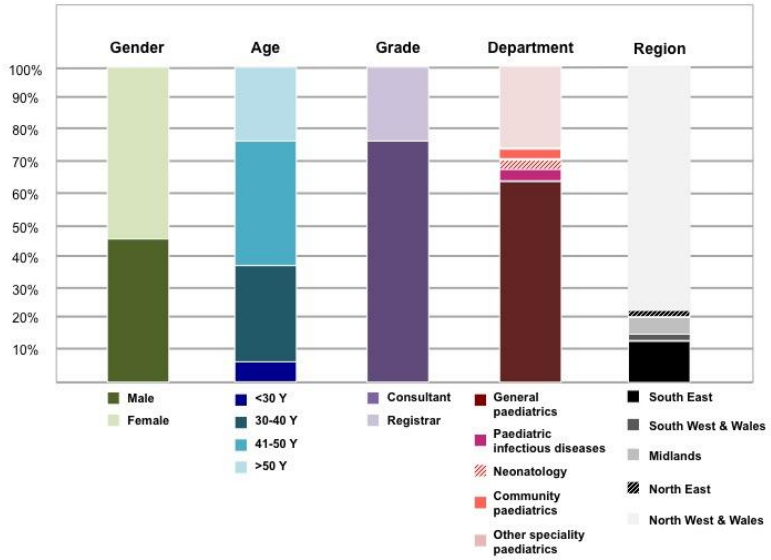

Figure 1 – Demographics

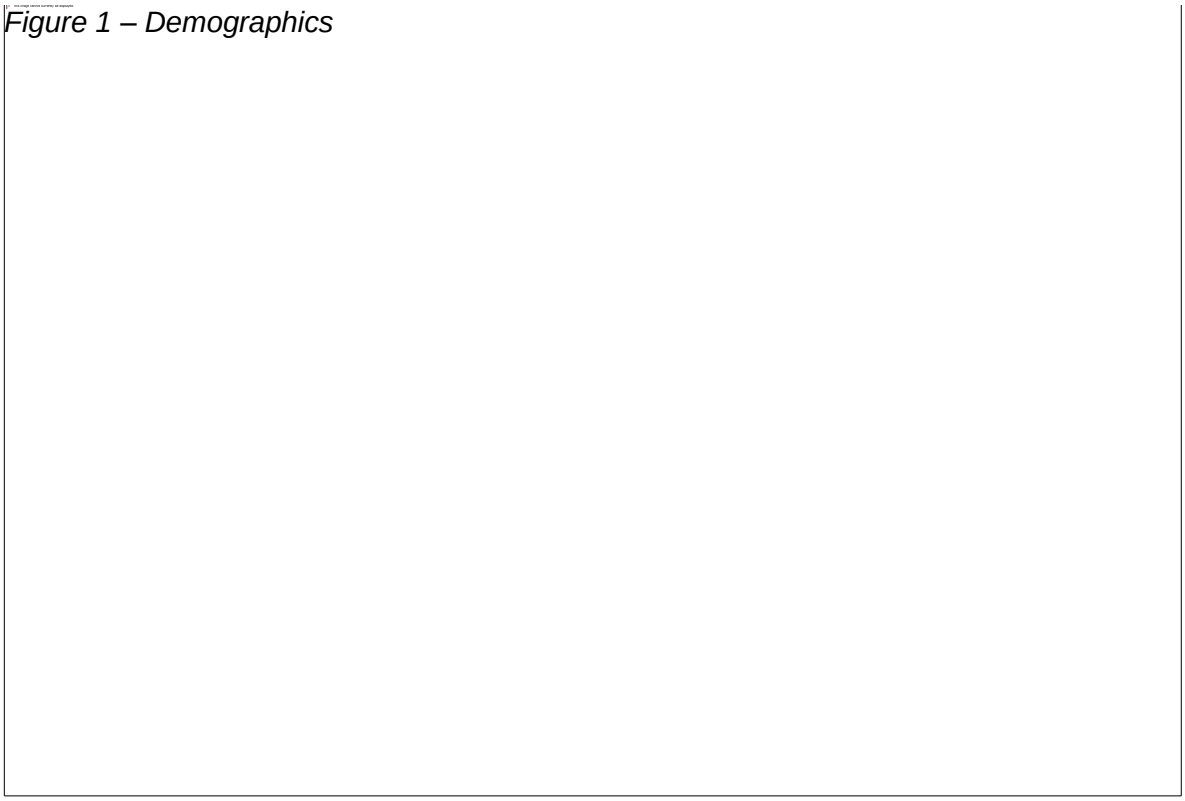

Figure 2 – Evaluation of patient groups

Conclusions

The results suggest that paediatricians in England and Wales are not uniformly performing HIV tests as recommended in the UK Testing Guideline. Even in high risk groups, such as children with suspected immunodeficiency or symptoms suggestive of HIV the rates were only 80% and 86% respectively. Greater awareness of National Guidelines and standards is likely to improve rates of HIV testing.

ESPID-0200

ANTIGENIC CHARACTERIZATION OF INFLUENZA VIRUSES ISOLATED IN SÃO PAULO, SP, BRAZIL: INFLUENZA SEASON 2013

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Introduction

Influenza virus season 2013 starts earlier in the state of São Paulo, Brazil, when compared with previous years; a surveillance task has been carried out aiming to cooperate with timely influenza virus variants detection and influenza virus strains selection for vaccine production.

Material and Methods

From January to October 2013 a total of 16.652 combined swabs specimens (nasopharyngeal and throats) were sent to the Institute Adolfo Lutz, cooperating with the National and Global Influenza Surveillance Network. The specimens were first tested by rRT – PCR by using the standard CDC protocol. Positive samples were selected for virus isolation in MDCK cells. Antigenic characterization was performed by using haemagglutination inhibition assay using antisera provided by World Health Organization (WHO).

Results

Of the 16.652 respiratory specimens investigated 3.211(19.28%) were positive for influenza viruses: 2.149 (66.92%); 178 (5.54%) and 884 (27.53%) were identified as influenza A (H1N1) pdm09, A (H3) and influenza B, respectively.

Conclusion

Antigenic characterization has demonstrated that the influenza A/California/7/2009 (H1N1) pdm09-like virus; and Influenza A/Victoria/361/2011(H3N2) – like virus has been identified during the influenza virus season 2013. Both strains matched the WHO vaccine composition recommended for the South Hemisphere. On the other hand the mismatch between WHO influenza B/Yamagata vaccine composition, and the circulating influenza B/Victoria viruses identified during January to mid – August has been observed. Influenza virus surveillance data will certainly assist the national public health authorities in order to make decisions on a quadrivalent vaccine composition.

ESPID-0201

ACUTE MASTOIDITIS IN CHILDREN: IS ROUTINE CRANIAL IMAGING ON ADMISSION NECESSARY TO DETECT INTRACRANIAL COMPLICATIONS?

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Background: Controversy exists regarding the incorporation of routine cranial imaging on admission to detect unapparent intracranial complications (IC) amongst children with acute mastoiditis (AM).

Objectives: To study the proportion of IC amongst children diagnosed with AM, and to determine whether this complication might be anticipated upon patient's presentation.

Methods: Children ≤ 18 years with hospitalized AM, 2005-2012, at two centers in Israel were included. Clinical and laboratory parameters of patients with and without IC, (e.g., venous sinus thrombosis, epidural, subdural or brain abscess), diagnosed by cranial computed tomography (C-CT), were compared retrospectively.

Results: Overall, 203 children were included of whom 8 (3.9%) had IC. *Streptococcus pneumoniae* (26.6%), *Streptococcus pyogenes* (15.6%) and *Pseudomonas aeruginosa* (11.5%) were the most common pathogens. There was no statistical difference between those with and without IC with respect to age, temperature on presentation, white blood cell count and c-reactive protein level, 3.4 ± 3.6 vs. 2.3 ± 2.1 years, p=0.29, 37.4 ºC ± 0.8 vs. 37.8 ºC ± 0.1, p=0.31, 20.7 ± 5.8 * 10^3 vs. 18.6 ± 6 * 10^3 cells/microL, p=0.31 and 128.3 ± 77.8 vs. 109.8 ± 80.8 mg/liter, p=0.43, respectively. Furthermore, there were no significant differences between the groups with respect to presence of otorrhea and the detected pathogen. Only two of the eight children with IC exhibited neurological signs.

Conclusions: Most children with IC complicating AM did *not* exhibit any ominous clinical or laboratory findings. Further studies should explore whether routine imaging is warranted for children presenting with AM.

ESPID-0204

DEVELOPMENT OF SELF-ASSEMBLED ROSETTE NANOTUBES FOR HIV-1 THERAPY

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Introduction: The development of therapeutics to target dendritic cells (DCs) for the treatment of diseases is of great importance, as these cells are known to play an important role in antigen processing and present them to the T- cells for eliciting the immune response. Herein, we explore the application of biocompatible, self-assembled rosette nanotubes (RNTs) as a therapeutic agent to deliver a HIV-1 antigen to the DCs. ELDKWA is linear fragment (epitope) present on the ectodomain of HIV-1 envelope glycoprotein 41 complex, which recognizes the galactoceramide receptors on the DC cell surface and lysine (K) acts as a spacer between the peptide ELDKWA and the RNTs.

Objective: Our strategy is to functionalize the RNTs on the outer surface with the peptide sequences lysine (K) and ELDKWAK, characterize their self-assembly and study their co-assembly as well as their uptake by the DCs.

Aim: We endeavor to develop a nanocarrier to deliver HIV-1 glycoprotein- 41 epitope (ELDKWA) for vaccine purpose.

Methods: The self-assembly of the RNTs were characterized using scanning and transmission electron microscopy (SEM and TEM) and the co-assembly has been proved by SEM and circular dichroism (CD) spectroscopy. The RNTs were labeled with a fluorophore to study their uptake by the DCs via confocal microscopy and flow cytometry.

Results: The co-assembled fluorophore labeled RNTs can easily enter the DCs.

Conclusion: RNTs are effective carriers of the antigen to the dendritic cells.

ESPID-0205

THE CLINICAL CHARACTERISTICS AND GENOTYPE DISTRIBUTION OF CHLAMYDIA TRACHOMATIS INFECTION IN INFANTS LESS THAN SIX MONTHS OF AGE HOSPITALIZED WITH PNEUMONIA

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Background. Chlamydia trachomatis is a common sexually-transmitted bacterial pathogens.As no routine screening is performed during pregnancy, neonates and infants are at high risk for C.trachomatis infection.

Objective. To investigate morbidity,characteristics and genotype distribution of C.trachomatis pneumonia.

Methods. Infant's clinical manifestations and laboratory results were recorded.Respiratory sputum specimens were tested using RT- PCR targeting C.trachomatis cryptic plasmid.Direct immunofluoresence for respiratory virus antigens and standard bacterial culture were performed.Positive C.trachomatis samples were genotyped using a multiplex PCR-RLB assay.The relationship between serovar and pneumonia severity was explored.

Results. Of 1408 infants, 101(7.2%) were infected with C.trachomatis.Sixteen of101(15.8%)were assessed as severe pneumonia.These severe cases had a higher proportion of viral co-infection(37.5%)compared to mild pneumonia (9.4%,$P<0.05$).Infants with tachypnea(OR9.2)and wheezing (OR3.5)were more likely to be classified as severe pneumonia($P<0.05$).Amongst66 C.trachomatis specimens for which a genotyping result were available,seven serovars were detected,and 39.4% specimens contained two or three serovars.Overall, serovar E(48.4%)was the most frequent, followed by serovars F(42.3%),J(31.8%),D(12.1%),K(12%),G(4.5%)and H(3%).Having mixed serovars E+J and E+J+G combined were associated with severe pneumonia(OR6.5,$P<0.05$).

Conclusion. C.trachomatis is a common bacterial pathogen in pneumonia for hospitalized infants less than 6 months of age.This study provides preliminary evidence of a relationship between serovar distribution and severity of pneumonia.Further in-depth investigations correlating serovar and disease severity based on larger population is needed.

ESPID-0206

A RARE CASE OF LEPTOSPIROSIS IN CHILDREN PRESENTING AS ACUTE MENINGITIS

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Introduction: Leptospirosis is re-emerging zoonotic disease with a worldwide distribution. The clinical presentations are diverse, ranging from undifferentiated fever to fulminant disease. The neurological leptospirosis forms are rare. Leptospirosis is more common and severe in adults compared with children. Reasons to explain this discrepancy remain unclear and limited data focusing on adolescents are available.

We report a rare case of leptospirosis meningitis in a 15 year old boy.

Case presentation: The disease onset was acute, a week before the hospitalization. The first symptoms were:hectic temperature, myalgia, arthralgia, somnolence and malaise. The day before the hospitalization, the temperature was normalized, but the headache enhanced and the patient was unable to walk, revealed meningeal syndrome and two episodes of the nasal bleeding.

Liver function was normal, spleen was not enlarged, no changes in the coagulation system. Urea - 30 mmol/L, creatinin – 210 µmol/L. Leucocytes – $8*10^9$/L, 84% PMNs, ESR – 42 mm/h, CRP – 96 iu/L. Lumbal puncture was performed – the opening pressure was elevated. The liquor characteristics were: leucocytes - 639 mm^3, cell differential - 72% PMNs, glucose – 63 mg/dl, protein – normal. Anti-HIV was negative. Liquor serology test: antileptospira Ig M (positive). The patient was treated with ceftriaxone, dexamethasone and mannitol.

Conclusion: Leptospirosis can have atypical symptoms at the beginning in children, moreover patient can have no fever at all. Patients with severe headache and meningeal syndrome should be examined on Leptospirosis if there is some definitive or suspected source of infection characteristic for it in anamnesis.

ESPID-0207

SAFETY OF NASAL INFLUENZA IMMUNISATION IN EGG ALLERGIC CHILDREN - INTERIM RESULTS FROM THE SNIFFLE STUDY

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Introduction: Egg allergy is common, affecting 2-9% of children. Live Attenuated Influenza Vaccine (LAIV; FluMist®, Fluenz®) is an intranasal vaccine widely available in USA and recently incorporated into the UK National Immunization Schedule. However, LAIV contains egg protein and, in the absence of safety data, is currently contra-indicated in egg allergy.

Objectives: We sought to assess the safety of intranasal LAIV in egg-allergic children.

Methods: Multi-centre phase IV observational study in children with a diagnosis of egg allergy, on the basis of published criteria. A single dose of LAIV was administered under medical supervision in hospital. Local ethical and regulatory approval was granted, and full informed consent was obtained. ClinicalTrials.gov Identifier: NCT01859039.

Results: 140 doses were administered in 132 children (mean 6±4 yrs). 67% had asthma; 55% received inhaled corticosteroids (Step 2+, British Thoracic Society (BTS) classification) while 28% also received additional preventer therapy (BTS Step 3+). 92% had experienced a previous allergic reaction to egg, 47% with prior anaphylaxis (WAO criteria). There were no systemic reactions. Three children experienced mild rhinitis within 20 minutes of administration, one further child experienced a local flare in eczema 50 mins after vaccine administration.

Conclusion: On the basis of this interim safety analysis, we calculate that the 95% upper confidence interval for occurrence of any allergic reaction to LAIV in egg-allergic children is <6.2% (<2.6% for anaphylaxis), a rate comparable to that reported for injected trivalent influenza vaccines. LAIV may be safe for use in egg-allergic children, in contrast to current recommendations.

ESPID-0208

EPIDEMIOLOGICAL PECULIARITIES AND COMPLICATIONS OF VARICELLA IN HEALTHY CHILDREN IN GEORGIA

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Introduction: Varicella is most often a relatively benign and self-limited childhood illness. Complications are rare, but in some patients the disease can be associated with a variety of serious and potentially lethal complications, in both healthy and immunocompromised children.

Our research aimed to identify epidemiological peculiarities and complications of varicella with correlations of age in healthy children.

Methods: We retrospectively studied the hospital charts of varicella in children admitted at the Infectious Diseases, AIDS and Clinical Immunology Scientific Practical Center of Georgia through the years 2012-2013.

Results: Totally 163 patients (55% male) were registered. 2012y -91 patients; 2013y - 72; Age distribution: ≤ 1y – 34 patients; 1-4 y – 72 patients; 5-14 y – 45 patients, 15-18y– 12 patients. Complications were found in 78 (47.8%) patients. Among complications varicella was found pneumonia in 36%, acute bronchitis in 18%, cerebelitis in 12%, encephalitis in 11%, cellulitis in 14%, pyoderma in 6%, lymphadenitis in 1%, pulmonary abscess in 1%, febrile seizure in 1%. The average overall duration of hospitalization was 4.6 days (1-25 days). Recovery was achieved in 100%.

Conclusions: The incidence of varicella complications depending on age groups was almost the same (53%, 43%, 46%, 50%). But the type of complications differed. In children of age group ≤1 and 1-4 years the most complications were pneumonia and acute bronchitis, while in age group 1-4 and 5-14y it was skin and neurological infections.

ESPID-0209

CLINICAL AND LABORATORY PROFILE OF DENGUE INFECTION IN CHILDREN

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Introduction and aims

Dengue infection has widely spread in India with atypical clinical presentations. We attempted to determine the clinical and laboratory findings of dengue serology (NS1, IgM, IgG) positive patients in children.

Methods

This is a retrospective analysis of 2013 data from a multispecialty centre in India. Patients presenting with acute fever (0-18 years) were screened for dengue serology by ELISA. The dengue cases were analyzed according to symptoms/signs, laboratory findings and final outcome.

Results

Among the 999 suspected cases, 291 children were positive for dengue serology; 286 were true positive and false positive was seen in 5 cases. The cases attained its peak in the month of August in 2013. All ages were affected; maximum cases seen in 16 years. Males were affected more than females. Among the 286 true positives, there were 126 exclusively NS1 positive, 52 NS1 & IgM copositive, 68 IgM & IgG copositive and 16 NS1, IgM and IgG copositive. Clinical history was available for 263 patients. The most common manifestations at admission were nausea/vomiting (46.4%), abdominal pain (30.4%) and myalgia (20.9%). The notable laboratory findings included prolonged activated partial thromboplastin time (aPTT, 40/42, 95.2%), elevated serum levels of aminotransferase (AST, 82.9%), thrombocytopenia (59%), low albumin (57.6%) and leucopenia (54.9%). Mortality rate in our study was 0.69%.

Conclusions

In endemic areas, a high index of suspicion to dengue infection should also be considered in any child presenting with fever, abdominal manifestations and elevated liver enzymes and use serological tests to confirm the diagnosis.

ESPID-0210

THE IMMUNOGENICITY OF HEPATITIS B VACCINE ACCORDING TO THE IMMUNIZATION TIME OF BCG VACCINE

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Introduction: Although the simultaneous immunization of BCG and hepatitis B vaccine is allowed, many Korean physicians tend to vaccinate BCG to 2-week old babies. BCG vaccination at earlier age can increase the occurrence of adverse reactions, and the simultaneous immunization reduces the number of medical visit.
Objectives: This study aimed to compare the immunogenicity of hepatitis B vaccine between simultaneous and separate immunization group of BCG and the second dose of hepatitis B vaccine.
Methods: We targeted to enroll children aged 7-18 months who vaccinated with Tokyo strain BCG percutaneouly. The subjects were divided into two groups based on the immunization time of two vaccines; the simultaneous immunization group (SI) was defined as the case that immunized with two vaccines at 4 weeks (25-34 days), and the separate immunization group (SE) as immunized with BCG at 2 weeks (11-20 days) and hepatitis B at 4 weeks. We measured anti-HBs levels.
Results: A total of 72 in SI and 121 subjects in SE were enrolled. Gender ratio (M:F) and the mean age of SI and SE was 1:1 and 1:0.75; 10.96±2.96 and 11.27±2.79 months, respectively. There were no differences in anti-HBs positive rate between two groups (83.3 *vs.* 84.3%, *P*=0.506). Also, the geometric mean titer showed no differences (73.30 *vs*. 77.35 mIU/mL, *P*=0.851).
Conclusion: There were no differences in immunogenicity of hepatitis B vaccine between two groups. The simultaneous immunization of two kind of vaccines at 4 weeks after birth can reduce the number of medical visit.

ESPID-0211

REALIZATION OF IMMUNIZATION SCHEDULE AMONG INFANTS FROM INTERVENTIONAL PRE-ADOPTIVE SETTING (WARSAW, POLAND)

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Introduction. Interventional Pre-Adoptive Setting (IPS) is an unique institution specialized in taking care of newborns and infants who are in critical situation without temporal or permanent parents supervision and care. Objectives.**The aim** of the study was to describe the realization of immunization schedule among children aged 0-12 months staying in IAS in years 2007-2011. **Material and methods.** The retrospective analysis of medical documentation (vaccination charts and medical records) of 472 children was conducted. Proportion of vaccinated children was calculated, reasons for delays in realization of immunization schedule were also analyzed. **Results.** All children were vaccinated against hepatitis B and tuberculosis after birth. 10-33% of children were to adoption before they finished 6 weeks, so they were not vaccinated at IPS. In 52-79% of children immunization program was realized in a correct way, in 21-57% of children delays in realization of immunization schedule were observed, mainly due to neurological conditions and acute infections. Pneumococcal vaccination was conducted in 48-79% of children.
Conclusions. Vaccination schedules were realized in a correct way in most of children. In future all vaccines for children from IPS should be reimbursed.

ESPID-0215

EVALUATION OF A FUTURE VACCINATION PROGRAM AGAINST INVASIVE MENINGOCOCCAL SEROGROUP B DISEASE USING EPIDEMIOLOGICAL, DISEASE-BURDEN, HEALTH-SERVICES AND ECONOMIC DATA

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Background and aims:

Neisseria meningitidis serogroup B (MENB) is the leading cause of Invasive Meningococcal Disease (IMD) in Israel. The availability of a MENB vaccine prompted a disease-burden study and a cost-utility analysis.

Methods:

An epidemiological study in the Jerusalem district and a model estimating the impact of a vaccination program (cost per averted DALY).

Results:

During 1999-2010, 213 IMD cases were reported in the Jerusalem district, (annual incidence rate 2.13±0.6/100,000); 181/213(85%) <15y, 90/181(49.7%) <2y. IMD outcome was evaluated in children <15y (n=181). *Neisseria meningitidis* serogroup B comprised 78% of isolates. Case fatality rate was 11.6%. Follow-up interviews (115/160 survivors, 72%), revealed at least one long-term sequela in 38/115 children (33%), including learning difficulties (22.6%), hearing impairment (7%), neurologic (12.2%), behavioral (14.8%) and motor (10.4%) deficiencies.

Implementing a MENB infant vaccination program (based on 78% vaccination efficacy) for 10 years was estimated to prevent 313 cases and 33 deaths from invasive MENB over the next 100 years. At an assumed vaccine price of $25 per dose, total intervention costs of $203 million, are partially offset by a $29 million reduction in treatment and sequelae costs. The resultant overall net cost of $93,980 per QALY gained (93,980 /QALY) deems the program to be cost-effective. Additional catch-up vaccination programs were not cost-effective.

Conclusion:

Disease burden data are essential in evaluating new vaccines. Depending on vaccine costs, a MEN B infant or even child vaccination program in Israel could be justified based on a cost-utility analysis combining epidemiological, health-services and economic data.

ESPID-0218

PARAINFLUENZA VIRUS TYPE 4 OUTBREAK IN AN INSTITUTE FOR DOUBLE HANDICAPPED CHILDREN

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Introduction

Although the epidemiology and diseases associated with parainfluenza virus (PIV) types 1 to 3 has been well described, less is known about the clinical role of PIV type 4 (PIV-4). We experienced an outbreak of respiratory infection with PIV-4 in our institute for double handicapped children in August 2013.

Materials and Methods

Using RNA from nasopharyngeal aspirates, RT-PCR was performed to detect specific sequences of various respiratory viruses. Serum antibody titer was assessed with enzyme immunoassay method.

Results

During the outbreak period, 22 patients presented with fever and respiratory symptoms. RT-PCR was performed using nasopharyngeal aspirates from five paients, and PIV-4 was detected from two samples. Paired serums of 20 patients were available for antibody assay, and seven of them were positive for PIV-4. Two patients had progressive respiratory distress requiring ventilation support. No PIV-4-positive patients presented with croup-like cough or significant digestive symptoms. Hand hygiene and contact precautions were reinforced, and the outbreak was finished about 40 days after the onset.

Conclusion

Although some patients had severe symptoms, PIV-4 infection may cause relatively mild respiratory symptoms. Intensive hand hygiene and contact precaution was necessary for control of PIV-4 infection.

ESPID-0220

RECURRENT BACTERIAL MENINGITIS IN A CHILD WITH MONDINI DYSPLASIA: A CASE REPORT

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Introduction:

Anatomical abnormalities are predisposing factors for recurrent bacterial meningitis. Mondini dysplasia is one of the congenital inner ear malformations that result from developmental arrest of interscalar septum and causes CSF leakage between subarachnoidal space and middle ear resulting in recurrent meningitis.

Herein we present a case with Mondini dysplasia and recurrent bacterial meningitis.

Case:

Case: A 3-year-old boy presented with fever and decreased level of consciousness to the emergency department. Two days earlier he had been admitted to another hospital with presumed diagnosis of enteritis and ceftriaxone therapy has been administered. Physical examination revealed fever and nuchal rigidity. In history, he had been vaccinated 4 times with conjugated pneumococcal vaccine. Cerebrospinal fluid (CSF) examination revealed 200 leukocytes/mm^3, elevated protein consentration (214 mg/dL) and low glucose level (1 mg/dL) but CSF culture was negative. Due to previous antibiotherapy, cephtriaxone and vancomycin combined therapy was administered for 14 days under assumption of partially treated bacterial meningitis. He was re-admitted to our hospital with fecer and nuchal rigidity 10 days after discharge. CSF culture revealed *Streptococcus pneumonia*. Vancomycin and ceftriaxone combined therapy was administered. Cranial computerized tomography (CT) showed decreased aeration in right middle ear and mastoid cells. Temporal bone CT showed dismorphic structure of semicircular canals, vestibular dilation and cystic appearance of cochlea. Audiometric screening was consistent with sensorineural hearing loss in right ear.

Conclusion:

In conclusion anatomical abnormalities should be investigated in patients with recurrent meningitis.

ESPID-0221

RESOLVING THE TUMOUR NECROSIS FACTOR-ALPHA PARADOX IN SEVERE MALARIA

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Introduction
High plasma Tumour Necrosis Factor-α (TNF-α) is characteristic of severe malaria (SM), and may be important in its pathogenesis. However, an effective innate immune response constrains parasite replication, and low production of TNF-α increases risk of SM.

Objective
To explain this paradox by examining TNF-α concentration relative to the total parasite biomass, and modeling the effect of variation in TNF-α production on parasite burden and absolute TNF-α concentration.

Methods
TNF-α, interleukin-10 and interferon-γ (IFN-γ) concentrations were measured in plasma samples from 142 Gambian children with *Plasmodium falciparum* malaria (39 SM) by luminex assay. Total parasite biomass was calculated from the plasma concentration of *P. falciparum* histidine rich protein 2, and used to generate a model of the risk of SM based on parasite biomass. An independent mathematical model of parasite replication (Dietz et al. 2006) was used to simulate the effect of varying TNF-α production.

Results
Children with SM had significantly higher concentrations of plasma TNF-α and IFN-γ, higher total parasite biomass, and lower TNF-α per parasite, than children with uncomplicated malaria (UM). Simulated reductions in TNF-α production predicted increased parasite biomass, increased risk of SM, and higher total TNF-α concentration in SM compared with UM.

Conclusions
These results suggest that insufficient production of TNF-α early in malaria infection allows rapid parasite replication, a high total parasite biomass, and ultimately a higher concentration of TNF-α. This resolves a longstanding paradox, which may also improve understanding of the role of variations in the innate immune response and the severity other infectious diseases.

ESPID-0223

QUANTITATIVE AND QUALITATIVE SEROLOGICAL RESPONSE TO 13-VALENT PNEUMOCOCCAL CONJUGATE VACCINE IN CHILDREN AND ADOLESCENTS WITH PERINATALLY ACQUIRED HIV INFECTION

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Introduction:
Children with perinatally acquired HIV (paHIV) are at increased risk of pneumococcal infection despite Highly Active Antiretroviral Therapy (HAART). Outside infancy, responses to pneumococcal conjugate vaccines remain under investigated

Aim:
To assess serological response to 13-valent pneumococcal conjugate vaccine (PCV13) in children with perinatally acquired HIV infection

Methods:
We measured pneumococcal serotype specific IgG in 48 paHIV infected child patients (CP), 27 young adult healthy controls (AHC) and 30 child healthy controls (CHC). Opsonophagocytic assay (OPA) titers for 3 PCV13-exclusive serotypes were measured in a subset of children. Serotype specific IgG was repeated 1 and 6 months following PCV13 vaccination of CP and AHC groups. OPA titers for 4 serotypes were measured at the 1-month time-point.

Results:
The majority of CP, CHC and AHC had serotype specific IgG >0.35μg/ml at baseline although OPA activity was undetectable for 2 of 3 serotypes studied. Baseline IgG concentrations were significantly lower in CP than AHC for a proportion of serotypes and were strongly predictive of responses to vaccine. After adjusting for baseline, post-vaccination IgG concentrations were comparable, although responses to some serotypes were impaired for CP. OPA correlated well with IgG post-vaccination. Detectable HIV viral load was associated with lower IgG concentration and OPA titer.

Conclusion:
Children with paHIV mount a robust serological response to PCV13 for most but not all vaccine serotypes. Viral load suppression with HAART and higher baseline IgG concentration are associated with higher post-vaccination antibody levels. This has implications for HAART treatment and vaccination practices.

ESPID-0224

CHARACTERISING VARIATION IN FIVE GENETIC LOCI OF CYTOMEGALOVIRUS DURING TREATMENT FOR CONGENITAL INFECTION

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Introduction: Congenital Cytomegalovirus (cCMV) infection occurs in 0.7% of births worldwide, causing sensorineural hearing loss (SNHL) and neurological impairment in a significant proportion of them. Ganciclovir prevents hearing deterioration and is used in clinical practice. Advances are being made in vaccine development and monoclonal antibody therapy, but little is known about variation in the underlying gene targets.

Objectives: To characterise baseline polymorphisms in the UL97 gene (target for ganciclovir), UL55 (Glycoprotein B, vaccine target) and UL128, UL130 and UL131a (monoclonal antibody target) genes in infants with symptomatic cCMV treated with ganciclovir and determine if strains resistant to ganciclovir were selected.

Methods: Serial blood, saliva and urine samples were obtained from 9 congenitally infected infants during treatment with 42 days of ganciclovir. UL97, UL55 and UL128, UL130 and UL131a gene sequences from these samples were also examined.

Results: All samples tested were UL97 wild type at baseline and none developed mutations associated with ganciclovir resistance.

UL55 genotypes were obtained for 77/103 samples (75%). The prevalence of genotypes were 39% gB1, 32% gB2 and 1% gB3. Mixed genotypes were found in 28% samples.

UL128-131a were sequenced in 120 samples. No mutations from wild-type were noted.

No evidence of body site compartmentalisation was seen in any of the 7 infants for whom UL128-131a sequences were available.

Conclusion : No ganciclovir resistance mutations in UL97 were selected during 42 days treatment, but polymorphisms exist in several CMV genes among infected neonates which may have implications for vaccine and monoclonal antibody intervention.

ESPID-0226

COMPLIANCE OF HEALTH CARE WORKERS WITH HAND HYGIENE PRACTICES IN NEONATAL AND PEDIATRIC INTENSIVE CARE UNITS: OVERT OBSERVATION

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Background: One of the most important method of preventing Health Care Associated Infections is hand hygiene. The objective of this study was to assess the compliance of hand hygiene (HH) of healthcare workers (HCWs) in the neonatal and pediatric intensive care unit in a tertiary university hospital in Istanbul.

Methods: An observational study was conducted on the compliance of HH for the five World Health Organization (WHO) indications. HCWs were observed during routine patient care. We also measure the technique of HH through hand washing or hand hygiene with alcohol based disinfectant.

Results: A total of 704 HH opportunities were identified during the observation period. Overall compliance was 37.0 % (261/704). Compliance differed by role: nurses (41.4%), doctors (31.9%) [p=0.02]. HCWs were more likely to use soap and water (63.6%) compared to waterless-alcohol-based hand hygiene (36.3%) [p<0.05]. Overall HH complience with respect to 5 MMH (My Five Moments for Hand Hygiene) were as followings: overall compliance of before patient touching was 43.2%, before a clean/aseptic procedure was 8.5%, after body fluid exposure was 18.1%, after patient touching was 68.1%, after touching patient surroundings was 43.2%.

Conclusion: Adherence to hand hygiene practice and use of alcohol based disinfectant was found to be very low. Effective education programs that improve adherence to hand hygiene and use of disinfectants may be helpful to increase the compliance.

ESPID-0231

LOW MOLECULAR WEIGHT HIBPRP-TT CONJUGATE WITH ENHANCED IMMUNOGENICITY

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Background and Aims: *Haemophilus influenzae* type b (Hib) is a pathogen amongst the leading causes of bacterial meningitis and pneumonia in children under 5 years of age in the developing world. The vaccines containing Hib capsular polysaccharide (HibPRP), have shown more than 90% efficacy against the incidence of Hib induced meningitis and pneumonia. However, introduction of Hib vaccines in developing countries has been slow due to limited availability and as it is the costliest component in multi-valent vaccines. Our attempt is towards developing a cost effective solution by bringing enhanced immunogenicity and hence dose reduction.

Methods: Immunogenic properties of well-defined HibPRP-TT conjugates developed using various sizes of HibPRP were investigated. The HibPRP was produced by bacterial fermentation and down-stream purification at Hilleman Labs and was characterized as per WHO-TRS. The purified HibPRP was fragmented to small size oligomers (5-10kD) using sodium metaperiodate. The HibPRP-TT conjugates were prepared using activated PRP with tetanus toxoid (TT) by reductive amination. The conjugates were evaluated for their animal immunogenicity in rat model in comparison to the commercially available HibPRP-TT conjugate vaccine.

Results: The anti-HibPRP serum IgG titers determined by indirect ELISA for the low molecular weight HibPRP based conjugate were more immunogenic even at half dose level as compared to the licensed comparator. The results from 2 different conjugate lots were repeatable.

Conclusions: The HibPRP-TT conjugate vaccine can be efficiently and effectively prepared using small sized HibPRP with better immunogenicity even at lesser dose levels and can bring preferential impact on vaccine cost.

ESPID-0232

DIAGNOSTICS OF VIRAL RESPIRATORY INFECTIONS IN CHILDREN: WHAT IS THE OPINION OF THE PHYSICIAN?

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Introduction Children with symptoms of a respiratory infection are often tested for respiratory syncytial virus (RSV) by nasopharyngeal aspirate analysis. Sometimes, other viral and bacterial pathogens are tested as well.

Methods All nasopharyngeal aspirate tests performed in the Jeroen Bosch and Bernhoven Hospitals (’s-Hertogenbosch and Uden, the Netherlands, respectively) in 2011 were analyzed. In these hospitals, RSV is tested first, followed by human metapneumovirus (hMPV) in case of a negative result. Subsequently, a survey was sent to the 34 physicians working in the pediatric wards asking when they request these tests and whether they would change their policy based on the results of the analysis.

Results 365 patients were tested for RSV and 208 for hMPV; 47% and 11% were positive, respectively. 79% of the physicians completed the survey. Suspected bronchiolitis (96%) and suspected pneumonia (22%) were the most important reasons to perform a nasopharyngeal aspirate. After presentation of the analysis, 60% would still request diagnostics for RSV because of complications associated with RSV, to distinguish between a viral and bacterial pathogen, and to be able to cohort RSV positive patients in case of shortage of isolation rooms. 81% would only test during the ‘season’, which they defined in different ways. 78% wanted to stop testing for hMPV because of the limited consequences.

Conclusions RSV and hMPV are common causative pathogens of respiratory infections in children. Because of the consequences of a diagnosis, physicians consider diagnosing for RSV useful in contrast to diagnosing hMPV. We stopped performing routine hMPV testing.

ESPID-0234

ATYPICAL PRESENTATION OF CAT SCRATCH DISEASE IN AN IMMUNOCOMPETENT CHILD WITH SEROLOGICAL AND PATHOLOGICAL EVIDENCE

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Introduction:

Cat scratch disease (CSD) is characterized by local lymphadenopathy following scratch or bite from a cat or kitten. Atypical presentation is rarely reported in an immunocompetent child, which include liver and/or spleen lesions.
Here in we present a case with systemic CSD in an immunocompetent child.
Case:
A 12-year-old boy was admitted to another hospital with 7 days history of fever, headache and weight loss. Empirical antibiotic therapy including ceftriaxone and clindamycin has been administered. After the abdominal ultrasound demonstrated multiple hypoechoic liver lesions, he was admitted to our department on the eleventh day of hospitalization. Physical examination revealed bilateral inguinal lymphadenopathy. Although inspection revealed no scratches or papules on skin examination, he had a history of playing with cats. In history, there was no any sympthom or complaint consistent with immunodeficiency or other underlying disease. Serological analyses by indirect fluorescent antibody (IFA) method detected the presence of immunoglobulin (Ig) G and IgM antibodies to *Bartonella henselae* with a titre 1:300 and 1:100, respectively. Abdominal magnetic resonance imaging showed multiple hepatic lesions. Images of cranial and thorax revealed no distinct abnormality. Ultrasound guided liver biopsy was performed. Histopathological analyses of the lesion showed granulomas with necrosis surrounded by palisade hystiocytes which compatible with CSD. He was treated with gentamicin (7.5 mg/kg) and rifampin (15 mg/kg) for six weeks.
Conclusion:
Systemic CSD is rare in an immunocompetent child and may mimic serious disorders. Although diagnosis is difficult in systemic CSD, early diagnosis and appropriate treatment is important to prevent complications.

ESPID-0236

IMMUNIZATION OF LIVER TRANSPLANT RECIPIENTS WITH MEASLES-MUMPS-RUBELLA LIVE ATTENUATED VACCINE IN HUNGARY

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The risks that scare people and the risk that kill people are very different!

Hungarian Special Immunization Service increasingly emphasizes immunization of patients before and after solid organ transplantation (SOT) since 80 % of patients are inadequately immunized and their serotatus against vaccine preventable diseases are unknown. According to vaccination guidelines for SOT candidates and recipients we apply our own experiences about immunization with measles-mumps-rubella (MMR) vaccine following the successfull immunization against varicella.

We report on MMR vaccination of 44 liver transplant (Ltx) patients between March 2004 and December 2013. Most patients have already been transplanted (29) at the time of the first visit. 80 % of them were incompletely or not immunize at all. Two years after the transplantation vaccination with live attenuated vaccines were performed on patients with stable graft function and well documented immune function. After successful immunization of 44 patients against varicella, 31 MMR susceptible subjects have got MMR vaccines with two shots, at 4 weeks interval.

39 Ltx patients were immunised with varicella and MMR vaccines, 25 of them are protected as measured with serological method (ELISA). No adverse events or breakthrough infections nor vaccine induced disease were detected following immunization.

Our patients are at risk, but an important functional pool of their immunsystem remain for protecting them. Their vaccination is safe and could be immunogenic and efficacious. Our goal is to continue the immunization procedure of SOT patients and share our experience with others contributing to updating the guideline of immunization of immunocompromised patients.

Author Keywords: solid organ transplant recipients, vaccination, live attenuated vaccines, protection, safety, efficacious

Abbreviations: Special Immunization Services (SIS), Solid organ transplantation(SOT), Liver transplantation (LTx), vaccine preventable diseases (VPD), Measles,mumps rubella (MMR)

ESPID-0237

INCIDENCE OF CONGENITAL CYTOMEGALOVIRUS INFECTION IN IRELAND: IMPLICATIONS FOR SCREENING AND DIAGNOSIS

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Background: Congenital cytomegalovirus (cCMV) causes serious intrauterine infection and is the leading cause of sensorineural hearing loss. In the absence of routine screening, asymptomatic infections, which constitute approximately 90% of all cCMV cases, remain undiagnosed; however many clinical abnormalities manifest later in childhood.

Aims: The aims of the present study were to determine, for the first time, the incidence of cCMV infection in a large maternity hospital in Dublin city and the optimal sampling method for neonatal screening.

Methods: A pilot screening study of asymptomatic infants born was conducted over a 12-month period. Mothers were consented and neonates screened for evidence of CMV infection (n=1044). Urine or saliva was tested for the presence of CMV DNA and reactive results were confirmed with follow-up testing and clinical evaluation.

Results: cCMV incidence in the asymptomatic neonates screened was 0.19%. An overall cCMV incidence was extrapolated based on the total number of live-births and data from those infants routinely screened for cCMV during the study period, and estimated as 0.23%. Neonatal urine collection proved prohibitive to mass screening. However, testing of saliva for CMV DNA was rapid, sensitive and suitable for screening. Furthermore, in a low prevalence population, pooling of patient samples proved effective and cost-efficient.

Conclusions: The present study concluded that there is a significant burden of undiagnosed cCMV infection in Ireland. The introduction of neonatal CMV DNA testing of saliva is viable, and could be considered as part of the national newborn screening programme, following a cost-benefit analysis.

ESPID-0238

ANTIBIOTIC TREATMENT OF PERTUSSIS– ARE 7 DAYS REALLY SUFFICIENT?

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Introduction: International guidelines recommend 7 days of antibiotic treatment for pertussis. This is based on few studies which implicated that 5 and 7 days of treatment with a macrolide antibiotic (azithromycin and clarithromycin, respectively) when compared to 14 days of erythromycin is sufficient to eradicate *Bordetella pertussis* (Bp) from the nasopharynx. However, eradication was tested by bacterial culture on the day of last treatment. At such an early time point, antibiotic levels in the host may have inhibited growth of bacteria which may still be viable and transmittable despite negative culture. We report a young infant with pertussis which remained PCR-positive for a prolonged period of time despite appropriate clarithromycin treatment.

Case: A newborn acquired PCR proven *Bp* infection at 4 weeks of age after exposure by several household members with unrecognized pertussis. Hospitalization was required due to apneic spells. Antibiotic treatment (15 mg/kg/d oral Clarithromycin) was started immediately and tolerated well. Quantitative PCR was 7.02 log (GEq/ml) at onset of treatment (day 1) and still 6.26 log at the end of treatment (d7). The test was repeated on d 11 and remained positive at 7.17 log. The child was doing well and discharged from hospital, however remained isolated and antibiotic treatment was prolonged for another week. Further PCR controls on d14 and d19 (end of 2nd antibiotic course) remained positive with 2.66 and 2.67 log.

Conclusion: 7 days of clarithromycin may be insufficient to terminate contagiousness of *Bp* infection. Prospective treatment studies using both PCR and culture are warranted.

ESPID-0239

A COMPARATIVE STUDY OF USE OF NORMAL SALINE VERSUS 3% SALINE NEBULIZATION IN CHILDREN WITH BRONCHIOLITIS: A DOUBLE BLIND RANDOMIZED CONTROLLED STUDY

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Introduction: There is necrosis and sloughing of epithelial cells, edema, increased secretion of mucus causing obstruction of large and small airways
Aims and Objectives: To find out the effectiveness of 3% saline over normal nebulization in bronchiolitis.

Methods: This is a double blind randomized controlled trial conducted at department of Pediatrics, Kathmandu Medical College from July 2012 to August 2013. The computer generated random number was used to select the case and control group. All eligible patients were randomly assigned to one of two groups: receiving inhalation of 4 ml normal (0.9%) saline or hypertonic (3%) saline mixed with salbutamol respirator solution. Treating physicians, researchers and nurses were all blinded of the solution. Both saline were kept in two identical containers and labeled as solution A and solution B. Patients in each group will receive three treatments on each day of hospitalization and clinical score were obtained 30 minutes before each inhalation session.

Results: Bronchiolitis accounted 11.26% of total admissions. Their mean age (±SD) was 8.56 (±5.013) months with range from 45 days to 24 months. A total of 53 (74%) male were enrolled in the study. Fifty seven (79%) children were less than 12 months and 15 (21%) were ≥12 months - 24 months. The mean (±SD) for duration of hospital stay was 44.82 (±23.15) and 43.60 (±28.25) for 3% and 0.9% group respectively (P=0.86). Likewise, mean (SD) duration of oxygen supplementation was 32.50 (±20.44) and 34.50 (±26.03) for 3% and 0.9% group respectively (P=0.85). Moreover time required for normalization of clinical score was 36.79 (±19.53) and 38.34 (±26.67) for 3% and 0.9% group respectively (P=0.80).

Conclusion: There is no advantage of hypertonic saline over normal saline nebulization in the management bronchiolitis.

Key words: bronchiolitis, hypertonic saline, nebulization

ESPID-0240

DTPW AND DTPA VACCINES IN REALIZATION OF IMMUNIZATION SCHEDULE IN POLAND

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Introduction. Vaccination against tetanus, diphteria and pertussis has been introduced into a national immunization schedule in Poland from 1960. The aim of the study was to estimate how often obligatory vaccinations (DTPw) are replaced by recommended vaccinations (DTPa) in a pediatric population. **Material and methods.** Medical documentation (vaccination cards) of 1341 patients form a single ambulatory care setting in Warsaw (Poland) was conducted. The proportions of children vaccinated with recommended vaccines were calculated. Type of vaccines and correctness of realization of vaccination schedules were also analyzed. **Results.** We observed an increasing trend in usage of recommended acellular pertussis vaccines (DTPa) instead the whole cell pertussis vaccines (DTPw): in 2005 only 63% of children were vaccinated with DTPa while in 2011 – 83,5% of patients were vaccinated with DTPa. An increasing trend in the usage of pentavalent and haxavalent vaccines was also described: in 2005 only 20% patients were vaccinated with pentavalent or hexavalent vaccine while in years 2009-2011: 78-80% patients were vaccinated with combined vaccines. In years 2005-2008 from 28% to 49,5% patients were not vaccinated according to manufacturers recommendations, while in 2009-2011 – only 1%. **Conclusions.** Most of children from the inner city population is vaccinated with recommended acellular pertussis vaccines (DTPa) instead of mandatory whole cell pertussis vaccines (DTPw). Our results may be used for future comparisons and may be helpful in creation of national immunization schedules.

ESPID-0244

A RETROSPECTIVE STUDY ON THE IMPACT OF CONTAMINATED BLOOD CULTURES

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Introduction:

Blood cultures (BCs) are pivotal in the management of bacteremic infections in children. Bacteremia has a significant risk of morbidity and mortality. There is thus a need to ensure that BC results are reliable and accurate. Blood must be cultured for five days to rule out bacteremia, thus patients are often discharged home (if clinically well) before the final results are available.

The aim of this study was to retrospectively determine the management and outcomes of patients who were called to return to hospital because of positive BCs.

Methods:

The Emergency Department (ED) admission log book was retrospectively studied over a 6 month period to identify patients who were called back from home because of positive BCs. All patient notes were reviewed.

Results:

1066 BCs were obtained in ED during the study time-frame. Eleven patients were phoned to return to ED because of positive BCs. Age ranged from 12 days to 7yrs. On initial presentation, two patients were pyrexial, four were prescribed oral antibiotics and one was admitted and subsequently discharged. The median time for BC growth was 19.9 hours. On return ten patients were admitted, 54% received IV antibiotics and 36% were observed. All 11 BC results were subsequently deemed contaminants.

Conclusions:

This study highlighted the impact of BC contamination on both patient care and hospital services. In order to standardise optimal patient care the following should be addressed 1) criteria for taking blood cultures 2) guidelines for aseptic BC sampling and 3) protocol for managing positive BCs.

ESPID-0245

INVASIVE PNEUMOCOCCAL DISEASE IN CHILDREN CAN REVEAL A PRIMARY IMMUNODEFICIENCY

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Introduction: Invasive pneumococcal disease (IPD) in children has a death rate of about 10% and 20-50% of the patients have neurological sequelae. Some primary immunodeficiencies (PIDs) are known to confer predisposition to IPD, but they have never been systematically searched in a series of children presenting with IPD.

Methods: We prospectively collected children hospitalized for IPD between 2005 and 2011 in 28 pediatric wards throughout France. IPD was defined by a positive pneumococcal culture, PCR and/or soluble antigen in a normally sterile site. Immunological workup included abdominal ultrasound, whole blood count and smear, plasmatic Ig levels, classical and alternative complement study, and evaluation of IL-6 production by whole blood cells stimulated by IL-1b, TLR agonists and heat-killed bacteria.

Results: A total of 163 children with IPD were included (M/F sex ratio: 1.3). Median age was 13 months and 17 children had recurrent IPD. Infection was meningitis (87%), pleuro-pneumonitis (7%), isolated bloodstream infection (4%), osteomyelitis, endocarditis or mastoiditis. One patient with recurrent meningitis had a congenital cerebrospinal fluid fistula. Immunological explorations were abnormal in 26 children (16%) and a PID was identified for 16 (10%), including one MyD88 deficiency, three deficiencies in complement fraction C2 or C3, one isolated congenital asplenia and two Bruton's agammaglobulinemia. The proportion of PIDs was higher in children older than two (14/53, 26%) than younger than two (2/109, 2%) ($p < 0.001$).

Conclusions: Children with IPD should be immunologically studied, particularly those older than two years, as a PID may be discovered in up to 26% of cases.

ESPID-0246

CONCOMITANT ADMINISTRATION OF TDAP, QUADRIVALENT MENINGOCOCCAL CRM-CONJUGATE AND HPV VACCINES IN HEALTHY ADOLESCENTS: IMPACT ON TDAP IMMUNOGENICITY AND REACTOGENICITY

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Background and aims: Current US recommendations for adolescents include vaccines against tetanus, diphtheria and pertussis (Tdap), human papilloma virus (HPV), and *Neisseria meningitidis* serogroups A, C, W, and Y. We investigated the impact of concomitant administration of a quadrivalent *N. meningitidis* conjugate vaccine (Menveo®, Novartis Vaccines) with Tdap and HPV vaccines, in terms of immunogenicity to Tdap antigens and overall reactogenicity.

Methods: In this placebo-controlled, multi-centre, randomized phase IV study, 801 healthy male and female volunteers, 11–18 years, received the Tdap (Boostrix®,GlaxoSmithKline Biologicals) and HPV (Gardasil®, Merck & Co., Inc) vaccines concomitantly with either Menveo® or placebo. Immune responses to Tdap antigens were assessed by ELISA one month after vaccination. Solicited local and systemic reactions were recorded for 7 days.

Results: One month after vaccination, 95% and 99% of subjects in the Menveo®group had antibody levels ≥ 1.0 IU/mL against diphtheria and tetanus toxoids, respectively, compared with 82% and 98% in the placebo group. Ratios of geometric mean concentrations of antibodies against pertussis antigens PT, FHA, and PRN for the Menveo®versus placebo group were 1.01, 0.84, and 0.82, respectively. Predetermined non-inferiority criteria for all Tdap antigens were met.

Solicited reactions were mainly mild and transient, the most frequent being injection site pain (41% and 35% for the Menveo® and placebo group, respectively, p=0.095) and myalgia (30% and 26%, respectively, p=0.31).

Conclusions: The three recommended adolescent vaccines in this study can be administered at the same visit without compromising Tdap immune responses or causing unacceptable reactogenicity.

ESPID-0247

NEISSERIA MENINGITIDIS SEROGROUP X: FIRST CASE IN ALGERIA

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Objective : We report the first case of meningococcal meningitis serogroup X in Algeria.

Methods: The laboratory diagnosis was made by PCR from a CSF sample, performed in a boy of 11 years, hospitalized in an infectious disease unit for suspected bacterial meningitis. We performed genes amplifications: *crgA* for *Neisseria meningitidis*, *lytA* for *Streptococcus pneumoniae*, *siaD* for genogroup *N.meningitidis* B, C, Y, and W135, *mynB* for group A and *xcb* for genogroup X.

Results: Only PCR gene *crgA* and *xcb* showed amplification bands of 230 and 200 bp respectively. The sequence analysis of the amplification product of the gene *xcb* show perfect homology with the gene of capsule of *Neisseria meningitidis* capsule locus gene cluster CPS_146501, strain ST-765 (HF562988.1).

Conclusion: Meningococcal disease X group , have been reported in invasive infections (Spain) , epidemics in Africa (Niger , Kenya , Ghana , and more recently in Burkina Faso) , and situation in portage (Turkey, Mali , UK). In Algeria, meningococcal meningitis prevails in endemic or epidemic. The serogroups found in order of frequency are: B, A, C , W135 and Y. The last outbreak in Algeria, was in 1997, it was due to serougroup A. The presence of *Neisseria meningitidis* serogroup X in our country, require close monitoring of the evolution of meningococcal disease and *N.meningitidis* strains in order to best know the epidemiological markers of circulating strains and controlling dissemination.

ESPID-0248

ANTIMICROBIAL SUSCEPTIBILITY OF HAEMOPHILUS INFLUENZAE ISOLATES IN CHILDREN WITH ACUTE RESPIRATORY INFECTIONS ATTENDING INFECTIOUS DISEASES HOSPITAL FROM BUCHAREST, ROMANIA - 2013

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Background – As community-acquired respiratory tract infectious are treated empirically knowledge of present and local resistance rates is essential in determining effective therapy

Aim – We described antimicrobial susceptibility of *Haemophilus influenzae* isolates in children with acute respiratory infections from Bucharest, Romania.

Methods – During the year of 2013, in the clinical laboratory of our 500 beds infectious disease teaching hospital, 231 isolates of *H influenzae* were collected from respiratory tract specimens of pediatric outpatients with upper respiratory tract infections. Organisms were identified as *H influenzae* by standard methodologies. Production of beta-lactamase was assessed by use of a cefinase disk test. Antimicrobial susceptibilites were determined by the appropriate Clinical Laboratory Standards Institute-approved methods and control was ensured using appropriate quality control organisms.

Results – Incidence of beta-lactamase produces was 4% (7/231). All 7 isolates producers of beta-lactamase were sensitive to ceftriaxone. Overall 84.9% of isolates were susceptible to ampicilin, 92.3% were susceptible to cefaclor and, 100% were susceptible to amoxicillin/clavulanate, ceftriaxone and azithromicine. Up to 93.9% of isolates sensitive to ampicilin were also sensitive to cefaclor.

Conclusions – Third generation cephalosporins have been show to possess excellent in vitro activity against beta-lactamase positive and negative isolates. Sensitivity to ampicilin was an accurate predictor of sensitivity to cefaclor – 93.9% of isolates were susceptible to both antimicrobials.

more); P < 0.001]

Conclusions – HARG is an important health care resources consumer being prevalent and frequently requiring longer hospitalization irrespective of age, gender, season or place of residence.

ESPID-0249

FREQUENCY AND CHARACTERISTICS OF INFECTIOUS DISEASES IN INTERNATIONALLY ADOPTED CHILDREN: A RETROSPECTIVE STUDY IN NANTES FROM 2010 TO 2012

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Introduction : Internationally adopted children are more susceptible to develop or carry infectious diseases. Specialised consultations exist in the main French cities, but specialised consultation with a paediatrician is not mandatory.
Aim : The main object of this study is to determine the frequency and the characteristics of infections (bacterial, viral, parasitic) among the followed adoptees in Nantes during the past three years.

Methods : A retrospective chart review was conducted on internationally adopted children who went through the « Consultation d'Orientation et de Conseil en Adoption » (COCA) between 2010 and 2012.
Results : One hundred and thirty three children were included. 55% had an infectious disease, 8% of which were severe infections. We found an important frequency of parasitic intestinal and dermatologic infections ((38%) (IC95%[30-46]) and (35%) (IC95%[27-43]) respectively, in particular among Haitians and Africans. African children were more likely to have infections that needed hospitalizations (OR=12, p=0,004 IC [1,3-113,7]), and carried more often extended-spectrum β-lactamase-producing bacteria.
Conclusion : Frequency of infectious diseases, and sometimes severe diseases, among internationally adopted children, justifies systematic specialized medical cares.

ESPID-0250

SELECTIVE TESTING STRATEGIES FOR GROUP A STREPTOCOCCUS IN CHILDREN WITH PHARYNGITIS: SYSTEMATIC REVIEW AND PROSPECTIVE MULTICENTER EXTERNAL VALIDATION STUDY

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Introduction – Whether clinicians can rely on clinical prediction rules (CPRs) to select patients with pharyngitis who should undergo rapid antigen detection testing (RADT) for group A *Streptococcus* (GAS) remains unclear.

Aims – To review existing CPRs for GAS pharyngitis in children and to externally validate them using a selective testing approach (Figure 1).

Methods – We systematically reviewed CPRs for pharyngitis in children. CPRs were applied to 569 children with pharyngitis from a French prospective office-based multicenter study (2010–2011). Calibration and discrimination were evaluated.

Results – We identified eight CPRs. Calibration was low and no CPR was able to identify low-risk or high-risk patients (Figure 2). Sensitivity, specificity, C-index and number of RADTs to use ranged from 74.9% to 96.0%, 36.1% to 87.6%, 0.64 to 0.88, and 23% to 88%, respectively (Table 1). The number of RADTs suggested by the CPR and the C-index were perfectly correlated ($p<0.0001$).

Conclusions – Available CPRs are insufficiently calibrated and cannot accurately rule in or rule out the diagnosis of GAS. CPRs are of poor help for clinically relevant selective GAS testing in children.

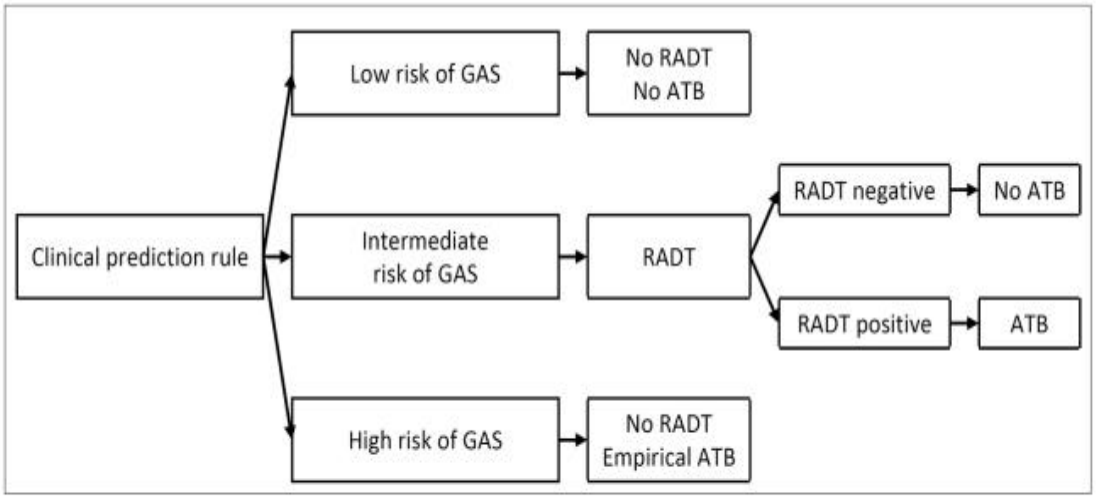

Figure 1. Selective testing strategy. GAS, group A *Streptococcus*; RADT, rapid antigen detection test; ATB, antibiotics.

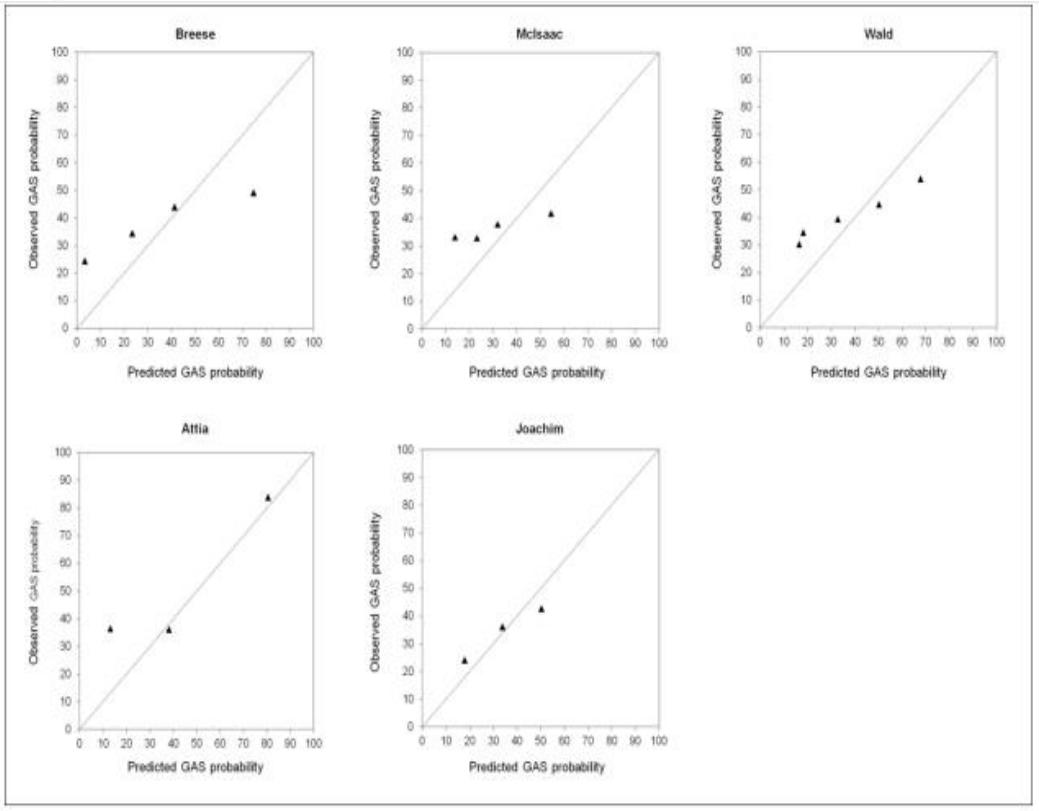

Figure 2. Calibration plots. Predicted group A *Streptococcus* (GAS) probabilities adjusted for prevalence. The diagonal line corresponds to perfect calibration.

Table 1. Discrimination of selective testing strategies (N=569)

Clinical prediction rule	Sensitivity (95CI)	Specificity (95CI)	C-index (95CI)	No. of RADTs, %
Breese	91.0 (86.5–94.4)	76.6 (71.8–81.0)	0.84 (0.81–0.87)	75
Edmond	74.9 (68.7–80.4)	77.2 (72.4–81.5)	0.76 (0.72–0.80)	46
McIsaac	96.0 (92.5–98.1)	43.1 (37.8–48.5)	0.70 (0.67–0.72)	44
Wald	94.6 (90.8–97.2)	63.3 (58.0–68.4)	0.79 (0.76–0.82)	65
Attia	89.2 (84.4–93.0)	87.6 (83.6–90.9)	0.88 (0.86–0.91)	88
Joachim	92.4 (88.1–95.5)	36.1 (31.1–41.4)	0.64 (0.61–0.67)	23

ESPID-0251

LACTOCOCCUS LACTIS CATHETER-RELATED BLOODSTREAM INFECTIONS IN AN INFANT: CASE REPORT

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Introduction:

Lactococcus lactis is a gram-positive coccus that is nonpathogenic in humans, to our knowledge, a few cases of infection with *L. lactis* have been reported. In here, we described a one-year-old boy with Down syndrome and Hirschprung disease who developed cathater-related bloodstream infection with *L. lactis* after gastrointestinal surgery.

Case:

He was hospitalized in the pediatric surgery unit since his birth because of Hirschprung disease (total colonic aganglionosis) and Martin-Duhamel procedure was performed. During surgery aganglionic terminal ileum, ileocecal segment and total colon was resected which caused recurrent diarrhea episodes and feeding intolerance. On the day of life 430, he had an episode of gastroenteritis and no pathogenic microorganism was found in the stool examinations. Because of clinical sepsis was suspected, blood cultures were taken both from central venous catheter and peripheral vein.

They were incubated at fully automated blood culture system (Bact/Alert, BioMérieux Clinical Diagnostics) and a signal of growing microorganism detected in 2 hours. Colonies were considered as viridans group streptococci and identified by Vitek-MS system (BioMérieux Clinical Diagnostics) as *Lactococcus lactis* spp *lactis.*

The microorganism was susceptible to penicillin, vancomycin and clindamycine.

The central venous catheter was not removed and he was successfully treated with vancomycin. Control blood cultures from both peripheral veins and central venous catheter were negative.

Conclusion:

Even *Lactococcus* species is accepted as nonpathogenic it should be kept in mind as a potential pathogen in infant.

ESPID-0253

SAFETY AND IMMUNOGENICITY OF THE NOVARTIS ACWY MENINGOCOCCAL ACWY CRM-CONJUGATE VACCINE IN CHILDREN, ADOLESCENTS AND ADULTS OF THE RUSSIAN FEDERATION

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Background and aims: In Russia, invasive meningococcal disease is responsible for severe morbidity and mortality, predominantly due to serogroups A, B and C, and some W and Y cases. We investigated the safety and immunogenicity of a conjugate MenACWY-CRM vaccine in a Russian population. This vaccine, Menveo® (Novartis Vaccines), is currently licensed in over 60 countries.

Methods: In this multi-centre, open-label, phase III study, healthy male and female volunteers were enrolled in three age groups (2–10, 11–17, ≥ 18 years, N = 66 per group) to receive one intramuscular dose of Menveo. Immunogenicity was assessed before and 28 days after vaccination using serum bactericidal activity with human complement (hSBA). Local and systemic reactions were recorded for 7 days, and medically significant adverse events for 28 days.

Results: Baseline hSBA titres were low for serogroups A, C and Y, but high for W, proportions with titres ≥ 8 increasing with age. One month after vaccination 85–92%, 76–89%, 95–98% and 79–94% of subjects had titres ≥ 8 for serogroups A, C, W and Y, respectively. Solicited reactions, reported by 59–67% of subjects, mostly consisted of transient, mild/moderate injection site pain. One 3-year-old subject withdrew before baseline blood draw and vaccination, but no other withdrawals occurred, and no serious adverse events were reported.

Conclusions: The quadrivalent meningococcal conjugate vaccine, Menveo, was generally well tolerated by subjects from 2 years of age and above, while eliciting strong immune responses against all four serogroups.

ESPID-0254

RADIOGRAPHIC AND CLINICAL CORRELATION IN CHILDREN WITH COMMUNITY-ACQUIRED MYCOPLASMA PNEUMONIA IN TAIWAN: A NATION-WIDE SURVEILLANCE IN 2010 TO 2011

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Introduction: Community-acquired pneumonia (CAP) is the leading cause for hospitalization of children. *Mycoplasma pneumonia*e is one of the most common pathogen. The disease severity is diverse, and the diagnosis is still a clinical challenge to pediatrician.

Aims: This study is aimed to provide nationwide surveillance of the epidemiology and manifestations of CA mycoplasma pneumonia (CAMP) in children in Taiwan.

Methods: Medical records of children enrolled by Taiwan Pediatric Infectious Disease Alliance (TPIDA) project during 2010 - 2011 were reviewed. The demographic, clinical, laboratory and radiographic data were analyzed. Their nasopharyngeal swabs, pleural effusion and serum were collected for multiplex viral and bacterial polymerase chain reaction (PCR), mycoplasma IgM, or paired IgG titer. Hospitalized children with segmental or lobar pneumonia were included.

Results: Overall, 128 children with CAMP were identified. Among them, 16 (12.5%) had both PCR and IgM positivity, 74 (57.8%) had positive serologic study, 35 (27.3%) had positive PCR detection, and the rest 3 (2.3%) had paired IgG increase. One patient was excluded without hospitalization. They were divided into two groups by age of 5 year-old. Children < 5 year-old were tend to have bilateral pneumonia. Furthermore, significant long hospitalization, high intensive care unit (ICU) admission rates, and complications were observed. They were more frequent to receive O_2 supply and even surgical intervention. Macrolide treatment was similar between two groups.

Conclusions: CAMP is not uncommon in children younger than 5 years. They are prone to have complicated hospitalization course. Early recognition and prompt treatment may improve the prognosis.

ESPID-0255

RESISTANCE OF CLINICAL ISOLATES OF STAPHYLOCOCCUS AUREUS IN CRETE

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Background. *S. aureus* resistance has increased worldwide with considerable clinical implications. We investigated the in vitro resistance of clinical isolates from children over a 6-year long period.

Population and methods. This study included all *S. aureus* strains isolated from children taken care for at the two major Hospitals of Crete from 2008 through 2013. Nasopharyngeal samples were not included. Clinical and resistance data were retrieved from the medical and microbiology records. Only one isolate per patient per episode was included.

Results. A total of 242 *S. aureus* strains were isolated, of whom 200 from skin and soft tissue infections, 13 in bronchoalveolar lavage and 29 in blood, skeletal lesions, CSF and pleural and peritoneal fluid. No trends were noted in prevalence (34-50 isolates per year), but some increase was observed for invasive episodes (8.9%, 10.7% and 16.5% for 2008-2009, 2010-2011 and 2012-2013 respectively, p 0.32). Non-susceptibility rates were 91.3% for penicillin, 49.2% for methicillin, 17.8% for clindamycin, 24.4% for erythromycin, and 2.1% for trisulfa. No resistance was observed regarding vancomycin, linezolid and rifampin. No differences in resistance were noted between invasive and non-invasive isolates. No significant trends in resistance were observed, except for decreasing resistance rates to methicillin (59.5%, 56% and 31.6% for 2008-2009, 2010-2011 and 2012-2013 respectively, p 0.0007).

Conclusions. In vitro resistance of *S. aureus* clinical isolates in the study area is alarming with almost half of the strains being MRSA. A molecular analysis is ongoing to determine the resistance and virulence patterns of these clinical isolates.

ESPID-0256

USE OF FILMARRAY BC-ID PANEL FOR INVESTIGATION OF CEREBROSPINAL FLUID SAMPLES FROM PAEDIATRIC NEUROSURGICAL PATIENTS WITH A POSITIVE GRAM STAIN

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Background: FilmArray is a cartridge based FDA-approved multiplex PCR assay which has a panel for the identification of certain organisms direct from positive blood culture bottles in approximately 90 minutes, as opposed to traditional culture and susceptibility testing which can take up to 2-3 days.
Aim: To examine if FilmArray BC(blood culture)-ID panel could identify the causative organism in CSF samples where organisms were seen on Gram stain.
Methods: 100 µl of neat cerebrospinal fluid (CSF) was injected into the cartridge in line with instructions for blood cultures.The cartridge was then placed into the machine and the results interpreted in line with the manufacturer's instructions. No funding was received for this project from the manufacturers.
Results: Two children had CSFs which had a positive Gram stain and were suspected to have ventriculoperitoneal shunt infections (aged 3 and 4 months).
Patient 1: The FilmArray BC-ID detected *Enterococcus spp.* within 2 hours, and the marker for vancomycin resistance (*Van A/B*) was not detected. Culture confirmed presence of *Enterococcus faecalis* two days later.
Patient 2: The FilmArray BC-ID detected *Staphylococcus spp.* and *S.aureus* was not detected. Of note, *mecA* genetic resistance was detected. Culture confirmed the presence of *Staphylococcus epidermidis* two days later as well as resistance to cefoxitin.
Conclusion: The FilmArray BC-ID offers the potential to identify certain organisms and antimicrobial resistance markers in Gram-stain positive CSF samples within 90 minutes as opposed to 2-3 days for traditional culture and susceptibility testing results.

ESPID-0257

AN UNUSUAL NEONATAL PATHOGEN: ACHROMOBACTER XYLOSOXIDANS PNEMONIA IN A PRETERM NEWBORN

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*Achromobacter xylosoxidan*s, previously named *Alcaligenes xylosoxidans*, a gram-negative bacillus which is found in soil and water, is an uncommon pathogen of low virulence known to cause serious healthcare-associated infection in the immunocompromised. Its inherent multi-drug resistance makes treatment difficult. Here we present a preterm newborn with *A. xylosoxidan*s pneumonia and a favorable outcome.

A male infant was born vaginally at 29^{+3} weeks of gestation with a birth weight of 1,060 gram from a 38-year-old woman. The mother had a complicated pregnancy with HELLP syndrome. The newborn developed severe respiratory distress and cyanosis at delivery and was soon admitted to the neonatal intensive care unit, intubated and ventilated with intermittent positive-pressure ventilation. Antibiotic therapy with ampicillin and gentamicin was started. On day 6 he was extubated. On day 22 he developed respiratory distress and was reintubated and mechanical ventilation started again. The chest radiography was suggestive of pneumonia. Antibiotic therapy with meropenem and vancomycin was started. On day 25 he was extubated and the lung infiltration cleared. Tracheal aspiration culture was positive for *A. xylosoxidans* and the organism was sensitive to meropenem. The patient was treated with meropenem for two weeks.

Although rare *A. xylosoxidan*s may be the cause of severe healthcare-associated infection in preterm newborns.

ESPID-0258
DISFIGURING DRUG RESISTANT LUPUS VULGARIS FOLLOWING INAPPROPRIATE TB TREATMENT

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Introduction

Lupus vulgaris may mimic many other skin diseases often delaying the diagnosis with subsequent scar formation. Microbiological confirmation remains difficult and the diagnosis depends mainly on clinical suspicion and histopathological features.

Methods

We describe a patient with a delayed diagnosis of lupus vulgaris following previous inappropriate TB treatment.

Results

A six year old girl was referred to us with a 2 year history of a progressively extending facial lesion. It started as painful pus-containing black lesion. Two years previously she had been treated for regional lymphadenopathy with rifampicin and fluconazole for 9 months. She was growing well. A large disfiguring ulcer, 5 cm in diameter and covered with pus, was seen involving the upper lip, nose and part of the face. Enlarged cervical lymph nodes were present.

Radiography revealed no bony involvement or signs of pulmonary tuberculosis. An HIV ELISA proved negative. The Mantoux test ulcerated. Two skin biopsies as well as a lymph node biopsy showed granulomatous inflammation with epitheloid cell granulomas. No acid fast bacilli or fungal elements were seen.

Screening of immune function showed normal immune-globulins and neutrophil function. Low CD3, CD4 and CD8 lymphocytes were found which improved after initiation of treatment. Sputum for tuberculosis was negative on microscopy, but on culture Rifampicin mono resistant *Mycobacterium tuberculosis* was found. The initial four drug TB treatment was changed to a modified MDR-TB regimen. On follow up she has markedly improved.

Conclusions

Lupus vulgaris, although rare in children, can be disfiguring if not treated correctly and timeously.

ESPID-0259

BREAST MILK AS SOURCE OF FATAL LATE-ONSET SERRATIA MARCESCENS SEPTICEMIA IN A VERY LOW BIRTH WEIGHT NEWBORN

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Human milk has potential to carry infectious agents, occasionally causing late-onset neonatal sepsis, especially in very low birth weight infants. Here we present a preterm newborn with fatal late-onset *Serratia marcescens* septicemia, due to mother's expressed breast milk (EBM).

Twin 1, a male neonate was delivered via emergency caesarean section at 28 weeks of gestation with a birth weight of 1,14 kg. He was admitted to the neonatal intensive care unit (NICU) for prematurity and respiratory distress syndrome. Therapy with ampicillin and gentamicin was started. After 48 hours, antibiotics were modified to teicoplanin and piperacillin-tazobactam because of the history of maternal chorioamnionitis. Minimal enteral nutrition was started with EBM on day 2. On day 7 he was clinically stable, his oral feeding reached to 80 cc/kg/day. Antibiotics were stopped on day 10.
On day 20 he suddenly developed abdominal distention, and his clinical condition rapidly deteriorated to septic shock within hours. Although advanced life support was provided, he died. *S. marcescens* was isolated from his blood and mother's stored EBM cultures. The same organism was isolated from breast milk directly obtained under sterile conditions. Twin 2 was clinically stable probably due to already receiving meropenem with diagnosis of necrotizing enterocolitis.

Breast milk should also be considered as source of infection in sudden onset septicemia of a stable newborn in NICU.

ESPID-0261

NOCARDIA BEIJINGENSIS EMPYEMA IN AN IMMUNOCOMPROMISED CHILD: THE FIRST DESCRIBED CASE IN SOUTH AFRICA

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Introduction

Nocardia species are aerobic actinomycetes that are found worldwide in soil, water and organic matter. Invasive nocardiosis begins in the lungs and can spread hematogenously to the brain, skin and other organs. Invasive disease occurs in immunocompromised patients, in particular patients with chronic granulomatous disease, HIV infection, organ transplantation, and patients on long-term systemic corticosteroid therapy. Mortality in HIV positive patients is high (40-60%) and successful treatment is dependent on rapid identification of the infection and early initiation of appropriate antibiotics.

Methods

We describe the case of a 5-year old boy with persistent empyema of 1 month duration that was transferred to a tertiary hospital for surgical management.

Results

The child was HIV infected with an absolute CD4 cell count of 31 cells/mm3 and an HIV VL 295 410 copies/ml. Prior treatment included penicillin, gentamicin, ceftriaxone and empiric TB drugs. Thoracotomy and decortication was done. Primary cultures on blood and chocolate, at 37° and 5% CO_2, yielded chalky, white, dry colonies within 2 days. Thin branching gram positive rods were visualized with occasional coccoid forms and subsequent modified Kinyoun acid fast stain was positive. The isolate was identified as *Nocardia beijingensis* using a molecular assay to target the 16S rRNA region. Despite adequate antibiotics the patient demised. No CNS involvement were found.

Conclusions

N.beijingensis was identified in China in 2001 and is characteristically susceptible to imipenem, tobramycin and kanamycin. To our knowledge this is the first South African report of infection caused by *N.beijingensis*.

ESPID-0262

SCREENING FOR RESPIRATORY SYNCYTIAL VIRUS (RSV) AND ISOLATION STRATEGIES IN CHILDREN HOSPITALIZED WITH ACUTE RESPIRATORY TRACT INFECTION

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Introduction: Nosocomial RSV infection is an important health risk in pediatric care which is largely preventable by efficient infection control measures, including the isolation of infected children. Efficient infection control depends on early identification of RSV infection. Pediatricians commonly rely on RSV rapid antigen detection tests (RADT) which are of limited sensitivity and therefore miss a considerable number of RSV infected patients. Host parameters such as age and duration of symptoms are associated with false negative RADT results.
Objective: The objective of our analysis was to evaluate if readily available host parameters can be combined with RADT to optimize RSV isolation strategy.
Methods and Study design: We retrospectively analyzed a cohort of 243 children under the age of 2 years hospitalized with an acute respiratory tract infection in order to identify host parameters associated with false negative RADT test result. We subsequently simulated the outcome of different isolation strategies based on RADT result and host parameters in view of isolation efficacy and isolation area required.
Results: Prolonged duration of respiratory symptoms and admission diagnosis were identified as independent risk factors for false negative RADT result. Based on a pretest RSV infection probability of 65% different cubicle isolation strategies for RADT negative patients (all, high-risk, none) result in a range of 0%-24% of non-isolated RT-PCR positive patients.
Conclusion: In comparison to RADT result alone, consideration of both RADT and clinical parameters associated with false negative RADT can result in an optimized isolation policy and could thereby reduce the rate of nosocomial RSV infection.

ESPID-0263

LUNG FUNCTION BY IMPULSE OSCILLOMETRY AT AGE 5-7 YEARS AFTER BRONCHIOLITIS AT AGE 0-6 MONTH

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Background and aims. Viral bronchiolitis in infancy has been associated with increased bronchial reactivity and reduced lung function in later childhood and even in adulthood. However, lung function at preschool age is less studied, mainly due to technical difficulties. The purpose of the study was to evaluate lung function and bronchial reactivity at preschool age in children who were hospitalized for bronchiolitis in early infancy.

Methods. Airway resistance and reactance, and bronchial reactivity to exercise were studied with impulse oscillometry (IOS) at the mean age of 6.3 years in 103 children hospitalized for bronchiolitis at less than 6 months of age.

Results. Lung function was reduced in 20% (resistance 8%, reactance 18% and both 6%) compared to Finnish population-based height-adjusted reference values. Increased bronchial reactivity by exercise challenge (5%) or bronchodilatation (11%) tests was present in 16%. Irreversible changes were revealed in only one case.

Conclusions. Though reduced lung function and increased airway reactivity were rather common, evidence for persistent lung function reduction was rare, less than 1%, at preschool age in children hospitalized for bronchiolitis caused mainly by respiratory syncytial virus at age less than 6 months.

ESPID-0264

PERTUSSIS: THE INCREASE OF THE DISEASE IN PORTO ALEGRE, RS, BRAZIL

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Background and objectives : Whooping cough is a highly contagious respiratory disease caused by *Bordetella pertussis*. In recent years, its incidence has increased with serious consequences for public health. This situation has been observed in several countries, including Brazil. The purpose of this article is to present the historical series and epidemiological profile of the disease in Porto Alegre.

Methods: We analyzed data on hospitalizations for pertussis and immunization coverage in Porto Alegre, Information System for Reportable Diseases-SINAN, Ministry of Health, Brazil, 2007-2013.

Results: 426 hospitalized cases. Peak in 2012.

360 (84%) <1year, 292 (69%) <6months.

Sex: no difference.

Race: white 334 (78%), black/brown 67 (16%)

DTP: 161 (38%) no doses, 131 (31%) one or two doses.

Diagnosis: PCR 226 (53%), culture 45 (10%), clinical/epidemiologic 152 (36%).
Evolution: improvement 414 (97%), deaths 4 (1%)

Average coverage (DTP) Porto Alegre 83%.

Conclusions: In recent years there was an increase in incidence, morbidity and mortality from whooping cough in Porto Alegre.

Children <1 year are the most affected by the disease, when they are not protected by vaccines and the disease is usually more severe.These results demonstrated that strategies such as increase vaccination coverage, vaccinating other groups (adolescents, pregnant women and health professionals and others), should be encouraged for the prevention and control of the disease. The observation that pertussis has been diagnosed even in vaccinated children suggests the need to develop more effective vaccines.

Improvements in surveillance enabling better diagnostics, reporting and control of the disease are of great importance.

ESPID-0265

PROFILE OF PERTUSSIS DEATHS IN PORTO ALEGRE, RS, BRASIL

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Background and objectives: Pertussis is a highly contagious respiratory disease caused by *Bordetella pertussis*. In recent years we have observed an increase in pertussis cases around the world, including Brazil. Deaths from the disease have been reported again. The objective of this paper is to present the profile of children who died from pertussis in Porto Alegre.

Methods: We analyzed data from pertussis deaths in Porto Alegre in the Information System for Reportable Diseases-SINAN, Ministry of Health, Brazil, 2007-2013.

Results: 426 hospitalized cases of pertussis.

4 children died (0.9%), 1 in 2011 (86 days old), 2 in 2012 (22 and 57 days) and 1 in 2013 (24 days). Lethality was 9.4/1,000 hospitalized.

Average age: 47 days of life.

Sex: no difference.

Race: all white.

DTP: all with no doses.

Diagnosis: PCR 2 (50%), culture 1 (25%), clinical 1 (25%). 1 case with co-infection with respiratory viruses.

Clinical: all with cough (2 paroxysmal, 1 winch), 3 cyanosis, 2 fever, 2 vomiting and 1 apnea. 3 had pneumonia as a complication.

Leukocytosis: 39,630-73,840 (average 65,557)

Unable to identify the indices cases.

Conclusions: It is observed in recent years an increase in the incidence, morbidity and mortality from pertussis in Porto Alegre.The most affected age by the disease is <1 year and deaths occurred in children <3 months, when they are not yet protected by the vaccine. These cases could benefit from mother vaccination during pregnancy.

The early diagnosis and treatment, considering the leukodepletion, could reduce deaths.

ESPID-0266

ANOTHER FACE OF KAWASAKI DISEASE

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Delays in the diagnosis of Kawasaki Disease (KD) can lead increase the risk of coronary artery lesion (CAL). We aimed to define both the characteristics of the patients with KD, and emphasize the infrequent and unusual findings of the diseases by selected cases. We evaluated 35 patients diagnosed with KD in our clinic between January 1994 and January 2013, retrospectively. Male to female ratio was 1.33 and the median age at admission was 22 months (1.5-132 months). Fourteen patients (40%) had CALs. Twenty-five cases (71.5%) had complete and 10 cases (28.5%) had incomplete KD and incidence of CALs in these groups was 36% and 50%, respectively. Two patients had giant coronary aneurysms. Intravenous immunoglobulin (IVIG) (2 g/kg/day) was administered routinely except two patients. Six cases received second dose IVIG and one patient received pulse methyl-prednisolone. Seven cases had unusual and infrequent presentation patterns and/or follow-up: Case 1 had lymphopenia, thrombocytopenia and eosinophilia. In addition to thrombocytopenia, Case 2 had stiff neck and aseptic meningitis. Case 3 had left sided peripheral facial nerve palsy; Case 4 and 5 had unusual gastrointestinal manifestations (paralytic ileus and appendectomy, respectively). Case 5 had also hypertension associated with KD. The last two infant patients (Case 6 and Case 7) were diagnosed with atypical KD with the symptoms of only high grade fever, elevated acute phase reactants and CALs. *Conclusion*: Physicians should be aware of all symptoms and laboratory findings of KD to avoid any delays in diagnosis and decrease the risk of life-threatening complications.

ESPID-0271

REPRESENTATION OF DIAGNOSING PROBABLE AND CONFIRMED PERTUSSIS IN CHILDREN: A REVIEW OF PEDIATRIC PERTUSSIS REGISTRY IN HASAN SADIKIN HOSPITAL-INDONESIA

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Introduction In developing countries, diagnosis of probable or confirmed pertussis is difficult to obtain. Curious diagnosing is needed and only a nearby vaccine manufacture Bio Farma has *Bordet Gengou* for confirming diagnosis.

Aims To describe the representation of pertussis diagnosis in children

Methods A retrospective study was conducted in pediatric pertussis registry Hasan Sadikin Hospital from October 2008 to December 2013. Demographic data, signs and symptoms at presentation, pertussis vaccination status, complications, and outcome were recorded.

Results Fortynine of 51 probable pertussis were documented. Mostly presented with shortness of breath while whooping-cough in 6 (12%). All patients presented in the second week of illness which all diagnosed as bronchopneumonia but two. The mean age was 6 months, ranged 0-50 months. One survive patient required mechanical ventilation. Only 2 patients had pertussis immunization. Absolute lymphocytosis were found in all patients. *Bordetella pertussis* culture performed in only 31 (62%) patients were positive in 2 (0,1%). There were no fatal cases, 43 (84 %) had good outcome.

Conclusions Mostly patients were admitted in paroxysmal phase when no more active *Bordetella pertussis* could be found from nasopharyngeal secret. A rigorous history taking particularly excessive, postcough vomiting and pertussis vaccination status should take into account.

ESPID-0272

ANTIBOTIC PRESCRIBING FOR MEDICAL PROPHYLAXIS-A COMPARISON OF PRACTICE IN THE UK, FRANCE AND LATVIA

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Introduction: A Point Prevalence Survey (PPS) was conducted as part of the Antibiotic Resistance and Prescribing in European Children (ARPEC) Project. Objectives and Aims: We report the variation in use of antibiotics prescribed for medical prophylaxis (MP) **to identify strategies to optimise management**.

Methods: A one-day PPS was conducted in November 2012 at three tertiary-care children's hospitals in Birmingham (UK), Paris (France) and Riga (Latvia) using validated and standardized ARPEC methodology.

Results: MP accounted for 67/183 (37%) of paediatric antibiotic prescriptions in Birmingham, 116/245 (47%) in Paris and 23/149 (15%) in Riga. The most common age group was under 5 years making up 27/41 (66%) patients in Birmingham and 22/52 (42%) in Paris but in Riga patients from 5-12 years: 6/14 (43%).

16 different antibiotics were prescribed in Birmingham, 24 in Paris and 6 in Riga. The most commonly prescribed antibiotics in all hospitals were co-trimoxazole 22 (33% of prescriptions) in Birmingham, 22 (19%) in Paris and 12 (52%) in Riga. In Paris it was also amphotericin B oral 22 (19%).

Antibiotics were most predominantly prescribed orally: 50 (75%) prescriptions in Birmingham, 98 (84%) in Paris and 21 (91%) in Riga.

The great majority of these antibiotics were prescribed empirically: 62 (93%) prescriptions in Birmingham, 113 (97%) in Paris and 23 (100%) in Riga.

Conclusions: The PPS identified differences in antibiotic use in three hospitals. Further studies are required to determine the appropriateness of the choice of antibiotics in MP and the diversity of agents prescribed.

ESPID-0273

THE INFLUENCE OF VACCINATION AGAINST INFLUENZA A(H1N1) DURING PREGNANCY ON INFANT'S HEALTH IN THE FIRST YEAR OF LIFE

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Introduction, objectives, aims: During the 2009 Influenza A (H1N1) pandemic, Dutch women in the second and third trimester of pregnancy were eligible for vaccination. We assessed the possible adverse effects of vaccination (Focetria®) on infant's health.

Methods: Pregnant women, participating in an H1N1-vaccination safety study, gave permission to obtain information on infant's growth and development (n=1739) and infection-related contacts with the general practitioner (GP; n=1671) during the first year of life.Z-scores for weight-for-age, length-for-age and head circumference-for-age, were calculated using Dutch references.Age specific assessment of fine and coarse motor function, speech, language and psychosocial aspects were quantified using a developmental score (D-score). The number of infection-related contacts with the GP was extracted from the medical record.

Influence of vaccination on growth and development and on GP contact rates were assessed using a multivariate linear mixed model and multivariate negative binomial regression, respectively, adjusting for birth weight, sex, parity (growth), educational level, country of birth (development and GP-contacts) and small-for-gestational age (GP-contacts).

Results : We found no difference between infants of vaccinated and unvaccinated mothers in:

-The z-score for weight-for-age (-0.05; 95%CI -0.13;+0.04), length-for-age (-0.01;95%CI -0.09; +0.06) and head circumference-for-age (-0.05; 95%CI -0.13;+0.03).

-D-scores (-0.05817; 95%CI -0.2849;+0.1685).

-The number of infection-related GP-contacts (incidence rate ratio was 1.07; 95%CI 0.91;1.28).

Conclusions: Growth, development and infection-related GP contact-rates, assessed after the first year of life, were similar in infants of mothers vaccinated with Focetria® during pregnancy and unvaccinated mothers.

ESPID-0274

MATERNAL GROUP B STREPTOCOCCUS VACCINATION RESULTS IN PLACENTAL ANTIBODY TRANSFER WITHOUT INTERFERING WITH RESPONSE TO ROUTINE INFANT VACCINATION

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Background and aims: *Group B streptococcus* (GBS) is a leading cause of meningitis and sepsis in early infancy. No licenced vaccine exists. To assess the potential for maternal immunisation to protect infants without interfering with routine diphtheria or 13-valent pneumococcal conjugate (PCV) vaccination, antibody responses were measured in infants born to pregnant women vaccinated with GBS vaccine.

Methods: 317 live infants were born to 315 healthy, HIV-non-infected South African women who received 0.5µg, 2.5µg or 5.0µg of an investigational CRM_{197}-conjugated GBS trivalent vaccine or placebo, between 28 – 35 weeks gestation. GBS-specific antibody concentrations were measured in infants at days 4, 43 and 91 of life. Antibody responses to diphtheria and PCV were also evaluated. Serious adverse events (SAE) and developmental milestones were assessed until 12 months of age.

Results: Infants born to vaccinated women showed significantly higher GBS-specific antibody concentrations at all time points, regardless of dose, than infants born to control women ($p<0.05$). Maternal antibody transfer rates against the three serotypes (Ia, Ib and III) were 49–55%, 49–79% and 58–72% in the 0.5µg, 2.5µg and 5.0µg groups, respectively. Proportions of infants with sero-protective levels to diphtheria and PCV serotypes (vaccine groups: 81%–100%, placebo: 75%–100%), SAE rates and developmental outcomes were similar across groups.

Conclusions: Maternal vaccination led to elevated infant GBS-specific antibody levels, without impact on diphtheria and PCV vaccination. GBS-specific antibodies remained elevated at day 43, suggesting that maternal vaccination may protect infants through the period of greatest vulnerability to GBS infection.

ESPID-0275

KNOWLEDGE AND ATTITUDES ABOUT HUMAN PAPILLOMAVIRUS AND IMMUNIZATION AMONG TURKISH PEDIATRICIANS

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Abstract

Objective and aim: Human papillomavirus (HPV) is one of the most common sexually transmitted infections, and the effectiveness of vaccine delivery programs will depend largely upon whether providers recommend the vaccine. The objectives of this study were to examine pediatricians' characteristics, knowledge, and attitudes associated with HPV and HPV immunization.

Methods: Attendees of the national pediatric meeting, in 2011, were asked to complete a questionnaire that, aside from demographic information, elicited level of agreement with statements regarding HPV, its related diseases, and HPV vaccination. It also documented attitudes and beliefs about HPV vaccination.

Results: Of the 480 attendees, 226 (47%) responded to the questionnaire. The level of pediatricians' HPV-related knowledge varied. The majority (78%) were aware that HPV infection is the most common sexually transmitted infection, while 51% were unaware that a condom is ineffective protection against HPV infection. Between 60–80% of respondents were aware of the effectiveness of HPV vaccination for women. On the other hand, only 10% were aware of reasons why men should be vaccinated against HPV. The majority (75%) of Turkish pediatricians were likely to recommend HPV vaccination to their daughter, if they had one. Seventy percent of pediatricians agreed that the HPV vaccination should be added to the National Immunization Program (NIP) in Turkey. However, the respondents documented concerns about the cost of the vaccination.

Conclusions: Increasing pediatricians' knowledge and awareness of HPV and HPV vaccination may assist with the implementation of an effective NIP.

ESPID-0276

BACTERIAL ISOLATES FROM TRACHEAL ASPIRATES IN UNDER-FIVE VENTILATED CHILDREN ATTENDING AT CRITICAL CARE WARD IN AN URBAN HOSPITAL IN BANGLADESH

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Background and Aims: Bacteriological data on ventilated children are very limited. We sought to evaluate bacterial etiology and their susceptibility in under-five children attending at ICU of an urban hospital in Bangladesh.

Methods: In this retrospective chart analysis, we evaluated the data of all children aged 0-59 months, admitted to the ICU of "Dhaka Hospital" of the International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b) between August 2009 and July 2013 and required intubation and mechanical ventilation and tracheal aspirate cultures were performed. We used electronic medical records of patients from the hospital for the data collection.

Results: Among 37 tracheal aspirate cultures that were performed 34(92%) had positive growths of bacteria. *Klebseilla* species 14(23%) were the predominant bacteria followed by *Escherichia coli* 11(18%), *Acenatobacter* 8(13%) and *Streptococcus* species 8(13%). *Enterococcus*, *Staphylococcus aureus*, *Pseudominas* and *Proteus* species were 6 (10%), 4 (7%), and 2(3%). Among the antibiotics those who went under susceptibility tests, imepenem 14/15(93%) and meropenem 11/13(85%) were sensitive to *Klebseilla. Escherichia coli* were also sensitive to these antibiotics in addition to amikacin 8/10(80%). *Streptococcus* was only sensitive to vancomycin 2/2(100%) where as *Acenetobacter* was not sensitive to any of the conventional antibiotics.

Conclusions: The main causative bacteria in under-five ventilated children are *Klebseilla* followed by *Escherichia coli*, *Acenetobacter* and *Streptococcus* species which are resistant to most of the conventional antibiotics and often required imepenem/ meropenem and/or vancomycin. However, prospective study with large sample should be carried out in different facilities and population to come in a proper consensus.

ESPID-0277

EFFECTS OF PROPHYLACTIC PARACETAMOL ON IMMUNOGENICITY AND REACTOGENICITY OF ROUTINE INFANT VACCINES AND 4CMENB: A PHASE 2 RANDOMISED CONTROLLED TRIAL

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Background: The novel meningococcal serogroup B vaccine (4CMenB), recently approved in Europe and Australia, may soon be included in routine infant immunisation schedules, subject to guidance from national or regional recommending bodies. During development of 4CMenB, and consistent with other newly introduced vaccines, clinical studies have shown concomitant administration with routine infant vaccines induces an incremental increase in some reactions, including fever. As this may hinder acceptability, we examined the impact of prophylactic paracetamol on the occurrence of fever and other solicited reactions, as well as the immune responses to study vaccines, in a prospectively designed study.

Methods: 4CMenB was administered as a four-dose series at 2, 3, 4 and 12 months of age concomitantly with routine infant vaccines DTaP-HBV-IPV/Hib and PCV7, with or without prophylactic paracetamol; a third group received MenC vaccine.

Results: Immune responses to 4CMenB were not decreased by the use of paracetamol prophylaxis and there were no clinically relevant effects on immune responses to routine vaccines. Occurrence of fever was higher in infants co-administered with 4CMenB compared with those given MenC vaccine, but was significantly decreased by prophylactic paracetamol, as were other local and systemic solicited reactions to vaccination. Co-administration of 4CMenB had an acceptable tolerability profile, with no withdrawals due to vaccination-related adverse events.

Conclusions: Inclusion of 4CMenB in routine infant immunisation schedules will be a major advance in the control of meningococcal disease, and our study indicates that by using paracetamol prophylaxis, post-vaccination reactions are reduced without clinically relevant negative consequences on vaccine immunogenicity.

ESPID-0279

EPIDEMIOLOGICAL AND ECONOMIC EVALUATION OF A UNIVERSAL 'MENINGITIS B' VACCINATION PROGRAMME IN IRELAND

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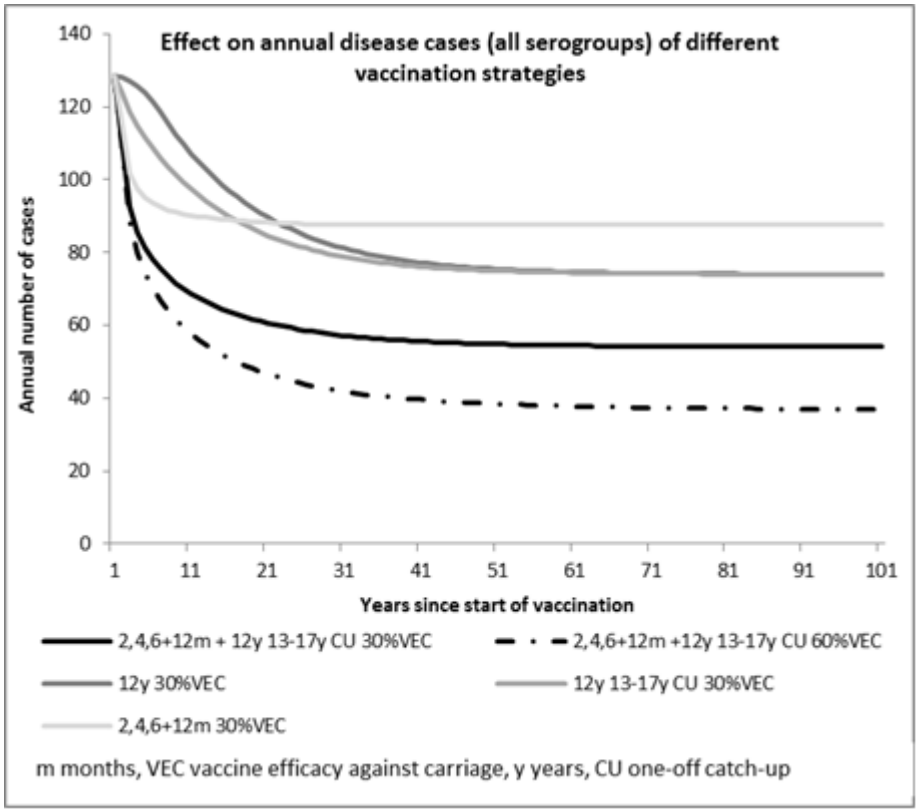
Background and aims: Meningococcal serogroup B is the leading cause of meningococcal disease in Ireland. A vaccine that protects against meningococci including serogroup B (Bexsero) was licensed in 2013. This study evaluates the epidemiological and economic impact of introducing this vaccine into the Irish universal vaccination programme.

Methods: An independently developed transmission dynamic model (Christensen et al. 2013) of meningococcal disease and vaccination allowing for herd effects was adapted using Irish epidemiological, resource use and cost data. Direct costs included ambulance transfer, acute care, long-term sequelae and public health response. Vaccination costs included cost per vaccine dose, administration and adverse events. Uncertainty was considered through scenario analysis. A range of vaccination strategies were considered.

Results: Assuming 30% vaccine efficacy against carriage (VEC) we estimate routine infant (2,4,6+12 months) and adolescent (2 doses in 12 year olds) vaccination with catch-up (13-17 years) is most effective (55% cases averted over 100year time horizon). Routine adolescent vaccination with catch-up was most economically favourable, but cases averted were limited in the short term. All vaccination strategies resulted in very high costs/QALY exceeding the threshold of €45,000/QALY, with the exception of adolescent vaccination with catch-up (assuming 60% VEC, cost per vaccine dose ≤€8).

Conclusions: Universal meningitis B vaccination has the potential to reduce IMD in Ireland, but at a very high cost. The most economically favourable strategy, assuming the vaccine can disrupt transmission, is routine adolescent vaccination with catch-up.
Acknowledgements: On behalf of the Bristol-NCPE collaboration*.


Effect on annual disease cases (all serogroups) of different vaccination strategies
Annual number of cases
140
120
100
80
60
40
20
0
1
11
21
31
41
51
61
71
81
91
101
Years since start of vaccination
2,4,6+12m + 12y 13-17y CU 30%VEC
2,4,6+12m +12y 13-17y CU 60%VEC
12y 30%VEC
12y 13-17y CU 30%VEC
2,4,6+12m 30%VEC
m months, VEC vaccine efficacy against carriage, y years, CU one-off catch-up

ESPID-0280

NINJURIN 1 GENE D110A SINGLE NUCLEOTIDE POLYMORPHISM AS A GENETIC MARKER FOR NERVE DAMAGE LEPROSY PATIENTS FROM SOUTH INDIA

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Background: Leprosy is a chronic granulomatous infection caused by *Mycobacterium leprae*, and obligate intracellular bacillus, that attacks cutaneous tissue and peripheral nerves producing skin lesions, nerve degeneration, anesthesia, infection and deformities.

Objectives: Analyze the Ninjurin 1 gene single nucleotide polymorphisms in leprosy patients from south India, and the role of the gene in the nerve damage.

Methods: A total of 106 subjects (Male: 65 Female: 41) with an average age of 37.05 ± 8.62 years Leprosy of experimental subjects with age and gender-matched control subjects were recruited. Genotyping was done by polymerase chain reaction/restriction fragment length polymorphism (PCR–RFLP–SNPs Confirmation for Sequence) methods.

Results: Leprosy patients with the CC genotype (ala/ala) had a higher risk of developing nerve disability when compared those carrying the AA genotype (asp/asp) and the variation observed were statistically significant ($P < 0.05$).

Conclusion: Present study revealed that D110A Codon variation may be a risk of nerve damage among leprosy patients in Tamilnadu, South India.

Acknowledgement: We are highly thankful to the Director, Superintendent and outpatient department staffs of sacred heart leprosy hospital, Tamil Nadu, for permitting and helping us to Sample collection. I express my sincere thanks to Dr. T.P. Velavan, Scientist, Institute of Tropical Medicine, University of Tübingen, Germany I deeply appreciate the motivations and support the research.

ESPID-0281

CLINICAL FEATURES OF RECURRENT KAWASAKI DISEASE AND RISK FACTORS

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Introduction The reported rate of recurrence of Kawasaki disease (KD) ranges from 1.4% to 3%, but the clinical features of and risk factors for recurrent disease remain unclear.

Material & Methods A retrospective review of the medical records of consecutive cases of KD from 2002 to 2010 in our hospital. Demographic, clinical data were recorded. Risk factors for recurrent KD were identified by a univariate analysis.

Results In total, 1,173 children with KD were included. Twenty-two had recurrent KD, with a recurrence rate of 1.88%. The average interval between the first episode and the recurrence was 12 months. At the first onset of recurrent KD, children had longer durations of fever before IVIG treatment, and higher levels of alanine aminotransferase (ALT), serum aspartate aminotransferase (AST) and lower hemoglobin levels than those with a single episode of KD. Logistic regression analysis showed that long durations of fever before IVIG treatment, high AST levels and reduced hemoglobin levels were associated with recurrent KD. Ten of 22 recurrent children had coronary artery complications during the first onset episode, and six (60%) of these also had coronary artery complications during the recurrence.

Conclusions The recurrence rate of KD is low. Children who may be at an increased risk of recurrent KD could be identified by longer durations of fever, lower hemoglobin levels and higher AST levels. Coronary artery complications are more likely to occur in children with recurrent KD if they were present during the first episode.

ESPID-0282

THE IMPACT OF SEQUENTIAL PCV7/PCV13 INTRODUCTION TO THE ISRAELI NATIONAL IMMUNIZATION PLAN (NIP) ON BACTEREMIC PNEUMONIA (BP) IN YOUNG CHILDREN

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On behalf of the Israeli Bacteremia and Meningitis Active Surveillance Group

Background: BP accounts for ~35% of all invasive pneumococcal disease (IPD) cases, in children <5 years. Our aim was to assess the impact of sequential PCV7/PCV13 introduction on BP *vs*. non-pneumonia IPD (NP-IPD) incidence in Israeli children <5y.

Methods: An ongoing nationwide, prospective, population-based, active surveillance. All IPD episodes from Jul-2004 through Jun-2013 in children <5y were included. PCV7 was introduced to the Israeli NIP in Jul-2009 and gradually replaced by PCV13 since Nov-2010, without catch-up.

Results: 983 (36.8%) BP and 1,687 (63.2%) NP-IPD episodes were recorded. BP had a higher proportion of children 24-59 months compared with NP-IPD (42.0% *vs*. 20.7%, P<0.001). Before PCV implementation, PCV7+6A serotypes (7VT+6A) predominated in BP in children <24m and in overall NP-IPD <5y (both >62%), while serotypes included in PCV13 beyond 7VT+6A (5VT, mainly 1, 5 and 19A) predominated in BP in children 24-59m (60%). PCV7 introduction resulted in a substantial reduction (49%) in NP-IPD, while BP rates were not significantly reduced, related to the relative importance of 5VT. Following PCV13 introduction, NP-IPD rates were further reduced. BP rate was significantly reduced by 56%, mainly due to reduction of serotypes 1, 5 and 19A (**Table**, **Figure**).

Conclusions: While NP-IPD rates declined post-PCV7 introduction, BP rates were not reduced significantly until PCV13 introduction. This disparity was mainly derived

from the relative importance of 5VT (not covered by PCV7) and the older age in BP.

Figure: Incidence rate ratio (IRR) of BP and NP-IPD rates in Israeli children <5 Years (reference point – pre-PCV period)

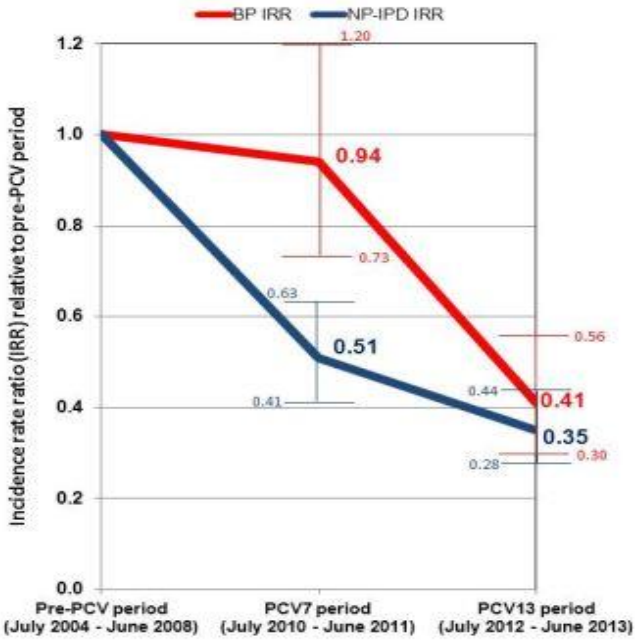

Table: 7VT+6A, 5VT and non-13VT BP and NP-IPD Incidence and incidence rate ratio (IRR) per 100,000 in Israeli children <60 months old

		Pre-PCV period* Mean ± SD	PCV7 period**	PCV13 period***	IRR (95% CI) PCV7 vs. Pre-PCV periods	IRR (95% CI) PCV13 vs. PCV7 periods	IRR (95% CI) PCV13 vs. Pre-PCV7 periods
BP	7VT+6A	9.6 ± 2.4	0.9	0.4	**0.09 (0.04-0.20)†**	0.41 (0.11-1.59)	**0.04 (0.01-0.12)†**
	5VT	6.8 ± 1.4	13.0	2.5	**1.92 (1.37-2.70)†**	**0.20 (0.12-0.31)†**	**0.38 (0.23-0.63)†**
	Non-13VT	0.8 ± 0.6	2.2	4.1	**2.59 (1.02-6.56)†**	**1.92 (1.07-3.43)†**	**4.96 (2.08-11.82)†**
	All serotypes	**17.2 ± 2.3**	**16.1**	**7.0**	0.94 (0.73-1.20)	**0.44 (0.32-0.60)†**	**0.41 (0.30-0.56)†**
NP-IPD	7VT+6A	20.9 ± 3.4	2.5	1.1	**0.11 (0.07-0.19)†**	0.45 (0.21-1.00)	**0.05 (0.03-0.10)†**
	5VT	8.0 ± 1.8	8.4	1.9	1.06 (0.74-1.50)	**0.23 (0.13-0.40)†**	**0.25 (0.14-0.44)†**
	Non-13VT	4.5 ± 1.3	6.0	8.7	1.33 (0.85-2.07)	1.44 (1.00-2.07)	**1.99 (1.32-3.01)†**
	All serotypes	**33.4 ± 3.6**	**16.9**	**11.7**	**0.51 (0.41-0.63)†**	**0.69 (0.53-0.89)†**	**0.35 (0.28-0.44)†**

* July 2004 through June 2008
** >70% of children <24 months received ≥2 doses of PCV7, July 2010 through June 2011
*** >70% of children <24 months received ≥2 doses of PCV13, July 2012 through June 2013
† P value <0.05

ESPID-0283

WARFARIN AND ASPIRIN COMBINATION THERAPY FOR GIANT CORONARY ARTERIAL ANEURYSM IN KAWASAKI DISEASE

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Introduction This study sought to assess whether warfarin and aspirin combination therapy can prevent cardiovascular events in children with giant coronary artery aneurysm (CAA) caused by Kawasaki disease.

Method Children with giant CAA secondary to Kawasaki disease in our hospital were included. They were randomly divided into warfarin group (warfarin + aspirin) and control group (aspirin only). The dose of warfarin was adjusted by INR (1.5-2.0). Follow-up time included 2nd week, 1st month, 3rd month, 6th month and every 6 months afterward. Clinical data and complications were recorded.

Result Sixty-five children were included with age of 3 months to 13 years. CAA most commonly occurs in right coronary artery, then left anterior descending, and main trunk. Left circumflex artery is rarely affected. CAA in 17 cases (53.1%) retracted in warfarin group, 5(41.7%)in controls. During follow-up, 2 children (6.3%) presented with intracoronary thromboses in warfarin group, 3 (25%) in controls. One case in warfarin group suffered myocardial infarction, 3 (25%) in control. Two children in control group died, while none in warfarin group. Coronary artery stenosis occurred in 2 children (16.7%) in controls, while one in warfarin group. Bleeding event occurred in 9 children including 1 with subarachnoid hemorrhage in warfarin group while only in 3 in the controls.

Conclusion Warfarin therapy could decrease the risk of thrombosis, myocardial infarction and mortality. Minor bleeding event is common and need to be monitored.

ESPID-0284

CHANGES OF MATRIC MMP-9 AND TIMP-1 IN A MURINE MODEL OF KAWASAKI DISEASE TREATED WITH CHINESE QINGYING DECOCTION

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Introduction This study sought to evaluate the therapeutic mechanism of Qingying decoction for acute KD.

Methods Lactobacillus casei cell wall extract (LCWE) was injected to C57BL/6 mice intraperitoneally to induce KD. Totally 120 mice were categorized into 4 groups: KD model, Qingying decoction treatment, IVIG treatment and control groups. Coronary artery lesion, expression of Matrix metalloproteinases-9 (MMP-9) and tissue inhibitor of Matrix metalloproteinases-1(TIMP-1) in cardiac tissue and coronary artery were evaluated.

Results In murine model of KD, a focal inflammatory infiltrate was identified in the coronary artery at 14 days and 28 days following LCWE injection.Broken elastin was observed at 56 days. In Qingying decoction and IVIG group, the inflammatory cell infiltrate was less severe as compared to controls, and there were no apparent broken elastin at 28days and 56 days following LCWE injection. The expression of MMP-9/TIMP-1 in Qingying decoction group and IVIG control group were lower as compared to controls at 14 days and 28 days following LCWE injection (all $P<0.01$). The activation of MMP-9 in Qingying decoction group and the IVIG group also were significantly lower than the murine model group of KD at 14 days and 28 days following LCWE injection (all $P<0.01$).

Conclusions Qingying decoction might reduce the coronary artery lesion by correcting the down-regulation of MMP-9 in murine model of KD.

ESPID-0286

ARE CURRENT PREVENTIVE STRATEGIES EFFECTIVE ENOUGH IN IMMIGRATED CHILDREN EXPOSED TO A HIGH RISK OF TB DISEASE?

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INTRODUCTION

In children the risk for progression to most serious forms of TB disease is greater when the latent TB is not adequately investigated and prevented. We report two cases exposed to household contacts, who developed a pulmonary TB.

CASE REPORT

Case 1 Male 1 year old coming from Ecuador. His mother was diagnosed with pulmonary MDR TB; in the same time he resulted TST positive and was given INH preventive therapy. Nevertheless one month later he developed pulmonary TB; he was hospitalized and treated with a three drugs regimen (pyrazinamide, ethambutol, rifampicin) for twelve months.

Case 2 Female 5 years old coming from Senegal. Because her mother was diagnosed with pulmonary TB the girl was once screened with TST that resulted negative. Four months later she was hospitalized with the same disease. She was firstly treated with pyrazinamide, rifampicin and intravenous amikacine and then with ethambutol and INH for ten months.

CONCLUSIONS

The screening of TB infection should have been more careful in both patients: the observation of the poor efficacy of INH in the first case and the TST repetition in the second would have reduced the risk of disease.

Moreover, the pulmonary TB required hospitalization and the parenteral administration of drugs for a few days because of vomiting; finally, the CT scan showed permanent sequelae in the lungs of both cases

Prevention of the infection's progression plays an important role in TB control and needs to be efficient notably in children living in contact with source cases.

ESPID-0287

LATE-ONSET GROUP B STREPTOCOCCAL SEPSIS: CLINICAL FEATURES AND EVOLUTION

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Introduction: *Streptococcus agalactiae* or Group B Streptococcus (GBS) is one of the main causes of sepsis in newborns and young infants.

Objective: To analyze cases of *late-onset* Group B streptococcal *sepsis*, diagnosed at a single tertiary care hospital in Madrid, Spain.

Method: Retrospective review of culture-proven GBS sepsis, after 7th day of life, between 2000 and 2013.

Results: Sixty-two episodes of *late-onset* GBS *sepsis* were diagnosed. Clinical onset started during after-birth hospitalization in 10 % of patients. SGB was identified in blood culture (60 cases) and/or CSF (13 cases). Fifteen (24%) presented meningitis. Mean age at diagnosis was 32 days (range 8 to 101 days). Mother's rectal-vaginal culture was positive for SGB in only 15%, negative in 55% and was *not performed in 30%*. The most common clinical symptoms were: fever (77%), irritability (60%) and food rejection (55%). Symptoms duration prior to hospitalization was brief (median 3 hours, range 1 to 48 hours). C-reactive protein at admission was less than 15 mg/L in 65% of cases. Empirical treatment was ampicillin plus cefotaxime in 60%. 55% of patients were admitted into critical care units. Tracheal intubation was required in 12 cases (19%) and vasopressor drugs were used in 7 cases (11%). Two patients died (3.2%). Among patients with meningitis, 5 developed severe neurological impairment (33%).

Conclusions: Despite preventive measures, GBS remains a leading cause of sepsis and meningitis. GBS continues to cause mortality and frequent neurological sequels.

ESPID-0288

TREATMENT OF CHILDREN AND ADOLESCENTS WITH VERTICALLY-ACQUIRED CHRONIC HCV HEPATITIS

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INTRODUCTION

In Europe prevalence of pediatric HCV infection ranges from 0.05% - 0.36%, mainly consequent to vertical transmission. Although the efficacy of therapy with pegylated interferon (PegIFN) and ribavirin (RBV) for the treatment of HCV infection is well established in adults, just few controlled trials have been performed in children. In 2010 the Italian Association for Drugs authorized the use of PegIFN alfa-2b and RBV in patients aged 3 – 17 years.

AIMS

We report the results of therapy in six vertically HCV infected patients

METHODS

Our patients (age 8 – 17 years) were treated with PegIFN alfa 2b (1.5 µg/Kg/week) and RBV (15 mg/kg/die). In one case with genotype 1b the treatment lasted 48 weeks; while 4 cases with genotype 2 and 3 were treated for 24 weeks. One patient with genotype 1a suspended the therapy for virological non response.

RESULTS

All but one patient achieved early virological response at 12 weeks of therapy, remaining negative till the end of therapy. Sustained virological response was determined in 2 patients; the remaining 3 are currently under treatment. We experienced minor side effects during treatment (fever > 38°C after the first PegIFN administration and injection site erythema), but no severe haematological events. Nevertheless a > 10% weight loss in one patient and severe dermatitis and dandruff in another one, both recovered after the end of therapy, were observed.

CONCLUSIONS

In our experience PegIFN/RBV treatment resulted not only effective and safe but also better tolerated in young patients in comparison with adults.

ESPID-0289

PRIMARY DEFICIENCY OF INTERLEUKIN-1 RECEPTOR-ASSOCIATED KINASE (IRAK-4) PRESENTING AS FATAL PSEUDOMONAS AERUGINOSA BACTEREMIA IN TWO SIBLINGS

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Background and aims: *Pseudomonas aeruginosa*, a Gram-negative bacillus and an opportunistic ubiquitous environmental microorganism, causes serious infection in children with immunodeficiencies. Deficiency of interleukin-1 receptor-associated kinase (IRAK-4), which is a protein of the Toll–IL-1R (TIR) intracellular signal transduction pathway, confers a predisposition to invasive bacterial infection. We present a case of fulminant *P. aeruginosa* sepsis in a child with previously undiagnosed IRAK-4 immunodeficiency, whose sibling presented one year earlier with a similarly fatal event.

Methods: A previously healthy 14-month old boy presented with sepsis and died within 48 hrs in the emergency department from disseminated *P. aeruginosa* infection. Fibroblasts from the deceased child were cultured and used for DNA extraction. PCR was performed and its products were sequenced for detecting IRAK-4 mutations. A functional assay was performed on fibroblast cells from the patient, healthy control, and IRAK-4 deficient patient upon stimulation with IL-1β.

Results: The child was found to be compound heterozygous for mutations in both alleles of the gene encoding IRAK-4. A splice mutation 1189-1G >A was transmitted by the mother and a splice mutation 831+5G >T was transmitted by the father. The parents had no medical history of immunodeficiency. The functional study on fibroblast cells found an absence IL-6 production upon IL-1β stimulation that confirmed the impairment of TIR signalling pathway in the patient's cells. The sibling was also inferred to have familial IRAK-4 deficiency.

Conclusions: Fulminant *P. aeruginosa* sepsis in early childhood may present as the primary manifestation of IRAK-4 deficiency.

ESPID-0290

MENINGOCOCCAL DISEASE INCIDENCE IN ARGENTINA: A HOSPITAL-BASED SENTINEL SURVEILLANCE.

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Background and aim Meningococcal disease (MD) is a medical emergency and a serious public health problem. As new meningococcal vaccines are made available MD surveillance is crucial to provide baseline epidemiological data before implementing preventive measures. Objective: to estimate the burden and clinical-epidemiological pattern of MD through hospital-based surveillance in Argentina. **Methods** 3-year prospective active surveillance of MD conducted at 6 pediatric hospital sentinel units. Report of 1st 22 months of the study (Mar/2012-Dec/2013). **Results** Out of 114674 hospitalized patients, 919(0.8%) had suspected meningitis and met the inclusion criteria. Of these, 182(19.8%) presented acute bacterial meningitis(ABM), 115 of which (63.2%) were culture confirmed cases and 28(24.3%) were *N.meningitidis*(Nm). In the 67 patients with culture negative ABM, PCR in CSF or serum samples was positive for Nm in 15 cases(22.4%). Forteen patients presented other MD forms, resulting in a total of 57 with MD (incidence:4.4 and 5.4 per10^4 hospitalized patients in 2012 and 2013 respectively). Thirty four (59.6%) boys, 59.6%<2 years. Clinical presentations were(n;%): meningococcemia and meningitis(20;35.1%), meningitis(20;35.1%), meningococcemia(7;12.3%), arthritis(5;8.8%), occult bacteremia(2;3.5%), meningococcemia and other foci(3;5.2%). CFR:10.5%(6/57); sequelae:26.3%. Nm serogroups were identified in 50 cases: W (26;52.0%), B (23;46.0%) and C(1;2.0%). No significant association was found between serogroups and age, nor CFR. **Conclusions** In this study period, the burden of MD in hospitalized children occurred in infants and young children. The use of PCR in clinical samples increased the rate of MD detection. The predominant serogroups were W and B. CFR was 10.5%, no association was found between the variables studied.

ESPID-0291

RAPID PROPHYLACTIC PALIVIZUMAB TO LIMIT A RESPIRATORY SYNCYTIAL VIRUS (RSV) OUTBREAK IN A NEONATAL UNIT

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Introduction

RSV outbreaks on neonatal units are a source of significant clinical and financial morbidity, and mortality. The unit is a level 2 20-bedded NICU, incorporating 4 intensive care cots and 16 high dependency/special care cots, accepting infants of 27 weeks upwards. The index case was an ex 28/40. Having been self-ventilating in air, he developed an oxygen requirement and required CPAP. Cases 2 and 3 were from within the same nursery, developed symptoms and tested positive with in the next 3 days.

Aim

To assess the limitation of an outbreak of RSV on a NICU by prompt use of Palivizumab and strict infection control measures.

Methods

Strict infection control measures were put in place, due to confirmed transmission within the neonatal unit. These included cohort nursing of cases and exposed infants, use of disposable gowns and gloves and restriction of visitors. The decision was made to immediately give all infants on the unit prophylactic Palivizumab.

Results

In total 6 out of the 19 infants were diagnosed with RSV. Two required CPAP, none required intubation and there were no deaths.

Conclusions

We suggest transmission and disease severity was limited by the rapidity of which the Palivizumab was administered, and that in combination with strict infection control we avoided morbidity and potential mortality. Studies in USA have shown a great economic burden of RSV in comparable units where the morbidity has been much greater, and we therefore feel that a similar proactive approach should be considered if an outbreak occurs.

ESPID-0292

GROUP B STREPTOCOCCAL ANTIBODY IN UNINFECTED INFANTS BORN TO MOTHERS WITH HUMAN IMMUNODEFICIENCY VIRUS (HIV) INFECTION

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Introduction: HIV-exposed, uninfected infants may have as much as twenty-fold increased risk of early/late-onset GBS disease compared to HIV-unexposed infants. Altered immune responses to Group B streptococcus (GBS) might contribute to increased vulnerability to GBS infection observed amongst HIV-exposed, uninfected infants.

Aims: To study maternal and infant GBS-specific antibody concentration at birth and at 16 weeks of age in the presence or absence of maternal HIV infection.

Methods: Paired sera collected from South African women and their infants were analysed by surface labeling immunosorbent assays for serotype-specific GBS IgG antibody at delivery and in infants at birth and 16 weeks.

Results: Compared with HIV-uninfected women (n=58), HIV-infected women (n=46) had lower serotype-specific (ST) antibody concentrations to GBS at delivery for serotypes STIa (p=0.02), STIb (p=0.03), STII (p=0.03), STIII (p=0.04) and STV (p=0.04). Transplacental transfer of antibody was reduced from HIV-infected women to their infants compared to HIV-uninfected women to their infants for serotypes STII (p=0.01), STIII (P=0.05) and STV (p=0.04). At birth, HIV-exposed uninfected infants (n=46) had lower levels of serotype-specific antibodies to GBS than unexposed infants (n=54) for serotypes STIa (p=0.009), STIb (p=0.04); STII (p=0.02); STIII (p=0.002) and STV (p=0.01). These differences between infants remained significant to 16 weeks of age.

Conclusions: Among South African mothers and infants, maternal HIV infection was associated with lower GBS serotype-specific antibody concentrations in mothers and infants as well as significantly reduced transplacental transfer of these antibodies; this may render these infants more susceptible to both early and late onset GBS disease.

ESPID-0293

HIGH CARRIAGE RATE OF EXTENDED-SPECTRUM BETA-LACTAMASE-PRODUCING ENTEROBACTERIACEAE AMONG WOUNDED SYRIAN CHILDREN HOSPITALIZED IN ISRAEL

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Introduction and aims: Three years of civil war in Syria has caused the deaths of 11,000 children, with many more wounded. During the last year, the Israeli army has transferred wounded Syrian children to medical care in Israeli hospitals, mainly Western Galilee Hospital (WGH) in Nahariya. Due to unknown medical history of these children and polio occurring in Syria, we conduct contact isolation and screening cultures for multidrug resistant (MDR) bacteria and polio. We investigated the rate of MDR bacterial carriage and phenotypically characterized the isolates.

Methods: All 23 Syrian children (ages 10 days - 16 years) admitted to WGH underwent screening by rectal swabs upon arrival, for extended-spectrum β-lactamase-producing (ESBL) *Enterobacteriaceae.*

Results: ESBL isolates were found in 14 children (61%): 14 were *E.coli* and 1 *K.pneumoniae*. Only 4 of the 14 children were treated in Syria for their injury prior to arriving in Israel. In comparison, ESBL's were cultured in 6/20 (30%) Israeli children with healthcare risk factors during the same period (p=0.042). Several ESBL+ *E.coli* phenotypes were evident: all were susceptible to ertapenem and amikacin but 21%, 29%, 50%, and 57% were resistant to ciprofloxacin, gentamicin, nitrofurantoin and trimethoprim-sulfamethoxazole respectively.

Conclusions: A high carriage rate of ESBL+ *E.coli* isolates is evident among Syrian children treated in Israel suggesting a high rate of ESBL's in Syria's pediatric population. Contact isolation of Syrian wounded civilians, until carriage of MDR isolates is ruled out, is important. Carbapenems and/or amikacin should be used in treating these children in case of severe sepsis.

ESPID-0294

PROSPECTIVE SURVEILLANCE OF SEVERE VIRAL RESPIRATORY INFECTIONS BY MULTIPLEX PCR IN PAEDIATRIC INTENSIVE CARE UNITS IN BAVARIA, GERMANY

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Background
In Germany, epidemiological data on severe viral acute respiratory infections (ARI) are limited. Frequency and clinical characteristics of ARI-associated viruses were investigated in a prospective surveillance study in 23 paediatric intensive care units (PICUs) in Bavaria.

Methods
From October 2010 to September 2012, naso-pharyngeal secretions of children >1 month and <17 years of age admitted to a PICU with ARI were tested for 19 viral pathogens by multiplex PCR.

Results
Out of 323 ARI patients, 224 (69%) were PCR-positive (79% viral mono-infections): RSV 38%; rhinovirus (RhV) 32%; parainfluenza (PIV) 12%; human bocavirus (hBoV) 10%; influenzavirus (IV) 9%; coronavirus (CoV) 9%; human metapneumovirus (hMPV) 4%; enteroviruses (EV) 4%; adenovirus 3%; parechovirus 2%. Median age varied between 0.1 year in patients with RSV and 6 years in patients with IV or CoV. Of patients with PIV, CoV or hBoV, ≥75% had underlying chronic conditions. Bronchitis/bronchiolitis was most frequently associated with RSV (85% of all RSV patients), pneumonia with CoV, hBoV and hMPV (83% each), secondary bacterial pneumonia with IV (37%), sepsis with EV (29%) und ARDS with RhV (20%). Life-threatening conditions occurred in 30%-40% of IV, CoV or hBoV patients, accounting for 4 out of 6 virus-associated fatalities overall.

Conclusions
RSV and RhV were the most frequent viruses associated with severe ARI, but their course of disease was rarely life-threatening. In contrast, infections with IV or CoV were fatal in 10% and 17% of cases, respectively. Of all viral ARI, 28% were associated with virus (sub)types described since the year 2000.

ESPID-0295

DISTRIBUTION OF 19 VIRAL PATHOGENS AMONG ACUTE RESPIRATORY INFECTIONS (ARI) IN PRE-SCHOOL CHILDREN IN BAVARIA (GERMANY) DURING THE INFLUENZA SEASON 2013

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Background

In Germany, the viral aetiology of ARI is mostly unknown. We therefore prospectively investigated children with ARI symptoms in 23 paediatric practices in Bavaria.

Methods

From January 2013 to May 2013, pharyngeal specimens of 1- to 5-year-old children with ARI were tested for 19 respiratory viral pathogens by multiplex PCR. ARI were defined by a body temperature ≥ 38.0°C and respiratory symptoms, with an onset of ≤48 h before the practice visit.

Results

Out of 318 prospectively enrolled ARI patients, 285 (90%) were PCR-positive: influenzavirus (IV) 50%, including IV A(H3N2)18%, IV A(H1N1)pdm09 17%, and IV B 15%; RSV A/B 25%; adenovirus (AdV) 18%; human bocavirus (hBoV) 13%; rhinovirus (RhV) 11%; human metapneumovirus (hMPV) 9%; coronavirus (CoV) NL63/ OC43/ HKU1/ 229E 9%; parainfluenzavirus (PIV) 1-4 7%; enteroviruses (EV) 2%; parechovirus was not detected. There were 63% viral mono-infections and 37% viral co-infections (2 viruses: 32%, 3 viruses: 3%, 4 viruses: 2%). The highest proportion of mono-infections was found for IV (65% of 142 patients), hMPV (62% of 26 patients) and RSV (50% of 70 patients). The highest proportion of co-infections showed hBoV (92% of 36 patients), EV (86% of 7 patients), and AdV (80% of 51 patients).

Conclusions

Multiplex PCR for 19 viral pathogens was positive in a high proportion (90%) of patients with upper airway ARI, with influenza and RSV accounting for most cases. Simultaneous detection of two or more viruses occurred in one third of the patients, suggesting a high incidence of co-infections.

ESPID-0296

SEVERITY OF PRIMO- AND RE-INFECTION WITH INFLUENZA IN PRE-SCHOOL CHILDREN – PRELIMINARY RESULTS FROM A PROSPECTIVE SURVEILLANCE STUDY

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Background

It is unknown whether the course of the first-ever acute respiratory infection (ARI) with influenza A or B (primo-infection) is more severe than during later acute influenza infections by the same influenza type A or B (re-infections).

Methods

Between January and May 2013, 318 children 1 to 5 years of age, presenting at a paediatric practice (n=23) with ARI (body temperature ≥38.0°C plus respiratory symptoms; onset ≤ 48h) and unvaccinated for influenza, were enrolled. Pharyngeal specimens were tested for influenza A(H1N1)pdm09, influenza A(H3N2), influenza B and 16 other viral pathogens by multiplex PCR. Primo-/ re-infections were defined by negative/ positive IgG antibody status, determined by influenza A and B IgG ELISAs. Additionally, clinical data were collected using a patient diary.

Results

From 142 PCR-confirmed influenza patients, 104 (73%) were included according to protocol. Influenza A was confirmed in 67 (64%) patients (35% A(H3N2), 29% A(H1N1)pdm09) and influenza B in 36 (35%) patients; median age of A/B patients was 3.4/3.9 years. Influenza A/B primo-infection was found in 35.5%/33.7% (median age 3.4/3.9 years), re-infection in 28.8%/1.0% (median age 3.5/4.2 years) of all 104 cases. The median duration of ARI was 4 days (IQR 3-5) for any primo-infection and 4 days (IQR 3-6) for any re-infection (p=0.302). Influenza A(H1N1)pdm09 ARI lasted longer than A(H3N2) ARI (median 6 vs. 4 days; p=0.027).

Conclusions

Preliminary data showed no difference in disease duration between influenza primo- and re-infection. However, there were differences in disease duration by influenza A subtype, with a longer duration for A(H1N1)pdm09.

ESPID-0298

EVALUATION OF 13-VALENT PNEUMOCOCCAL CONJUGATE VACCINE IN INFANTS: SYSTEMATIC REVIEW AND META-ANALYSIS

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Introduction

Streptococcus pneumoniae remains a leading cause of serious illness, including bacteremia, meningitis, and pneumonia among children worldwide. A 13-valent pneumococcal conjugate vaccine (PCV13) has been developed to improve protection against pneumococcal disease beyond that possible with the licensed 7-valent vaccine (PCV7).

Objective

To compare the safety and immunogenicity of PCV13 versus PCV7 in paediatric population.

Methods

We carried out a systematic review and meta-analysis. A literature search was realized in electronic databases MedLine, Embase, the Cochrane Library, CRD, SCI, NICE, and hand search in specialties journals, with MeSH terms and free terms. Inclusion criteria were clinical trials with infants vaccinated with 13-valent pneumococcal conjugate, compared to 7-valent vaccine. We recorded the results immunogenicity and safety. Quality of the studies included was assessed using the CASP and Jadad checklists.

Results

There were selected nine randomized clinical trials with high-moderate quality, of 258 potentially relevant references, in the meta-analysis. Both vaccines were well tolerated in all groups of infants, and most local reactions and systemic events were of mild or medium intensity and typical of any injected vaccine. All studies included in the meta-analysis showed high immunogenicity for both pneumococcal vaccines in all tested serotypes. An anti-polysaccharide antibody concentration of ≥0.35 µg/mL was achieved in at least 89% of the infants.

Conclusion

PCV13 has a similar safety profile, and is as effective as the PCV7 in the prevention of invasive pneumococcal disease caused by the seven common serotypes of *S. pneumonie*, and could provide expanded protection against the six additional serotypes.

ESPID-0299

VALIDATION OF PCR-BASED TESTING FOR SURVEILLANCE OF MULTIPLE DRUG RESISTANT ACINETOBACTER BAUMANNII IN A PEDIATRIC WARD

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Background and Aims

Multiple drug resistant *Acinetobacter baumannii* (MDRA) is an emerging public health threat in Japan, causing high rates of in-hospital mortality. Prompt detection of MDRA is crucial but the organism is difficult to identify when utilizing conventional culture methods as *Acinetobacter* species are generally classified according to genetic type. In response to an outbreak of MDRA (OXA51/ ISAba1) in our tertiary care hospital, we conducted a PCR-based surveillance for identifying MDRA in a pediatric ward.

Methods

The surveillance study was carried out from March 2012 to May 2013. Sputum, nasal swabs and urine samples were collected from all patients in our pediatric ward and PCR analyses were conducted. Identification of the ISAba1 insertion sequence was considered as MDRA positivity. MDRA-positive patients were isolated from other patients and standard precautionary procedures for infection control were put into practice.

Results

Of the 10 cases of *Acinetobacter baumannii* identified during surveillance, 3 cases with sputum samples obtained from transtracheal aspiration of ventilated patients were positive for MDRA. Of the remaining 7 cases, 2 had the same gene and were patients transferred from the same hospital. All cases were considered to be usual flora and complications associated with *Acinetobacter baumannii* infection were not observed. No new cases of MDRA were identified during the last six months of surveillance.

Conclusion

PCR-based testing appears to be effective in containing an MDRA outbreak in the pediatric ward.

ESPID-0300

EVALUATION OF HERPES-ZOSTER VACCINE IN ADULTS: SYSTEMATIC REVIEW

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Introduction

The reactivation of Varicella-Zoster virus causes a rash known as herpes-zoster. It is more frequent from 50 years, and increases with age. The main complication is the postherpetic neuralgia, which can cause a serious decline in the quality of life of patients.

Objective

To evaluate the efficacy and safety of the vaccine for the prevention of herpes zoster in adults aged 50 years and over.

Methods

Systematic review of the literature (2005-2013). A literature search was performed in electronic databases such Medline or Embase, and a hand search in journals. Inclusion criteria were clinical trials in adults vaccinated against herpes-zoster, recording results of efficacy and safety. Quality of studies was assessed by CASPe checklist.

Results

12 clinical trials of moderate quality were included. The ranges of antibody titters (GMT) were higher in the vaccinated group compared to placebo (471-810 vs. 292-391 gpELISA/mL). GMFR ranges were also higher (2.3-1.9 vs. 1.0). Vaccination reduced the burden of herpes zoster, with a protective efficacy of 51-70%. There was also a decrease on postherpetic neuralgia, with a protective efficacy of 48%-79%. Local adverse effects (60% vs. 14.7%) and systemic (13% vs. 8%) were higher in the vaccinated groups, the most frequent reactions were pain, redness, and swelling. Serious adverse events and deaths were not different between groups.

Conclusions

The vaccine against herpes-zoster shows good efficacy and safety profile. Vaccine has good immunogenicity and reduces the incidence of herpes zoster and postherpetic neuralgia. Serious adverse effects are rare and occur similarly in studied groups.

ESPID-0301

THE RISK OF PULMONARY COMPLICATIONS OF PERTUSSIS IN CHILDREN

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Background: Ukraine has experienced a prolonged pertussis epidemic since 2008. The peak incidence of pertussis complication occur in young children.

Methods: We analysed 67 children (age 1-24 mon.) admitted to Lviv Infectious Diseases Hospital due to pertussis between 2010 and 2013 y. Pertussis were confirmed by the presence of pertussis toxin IgM & IgG in the blood, which were determined by ELISA. We investigated the IL1b, IL2, IL10, TNFa, INFγ, levels in blood, sIgA. The pertussis severity were assessed by M.-P. Preziosi scale. Respiratory tract secrets culture were made. The analysis was conducted for 102 variants, including epidemiological and clinical dates and laboratory tests results.

Results: The patients were divided into 2 groups, the first group - 26 children (age 12,21+0,31 mon.) with uncomplicated course of pertussis, the second group - 41 children (age 8,13+0,18 mon.) with pertussis with respiratory complications. Using stepwise multivariable & logistic regressions we found some factors that significantly associated with a higher risk of pulmonary complications of pertussis in infants. In the final regression model ($F(5,17) = 7,24$, $p < 0,02$) included: the WBC level on day 5 stay at hospital ($\beta = 0,67$), the level of IgG to pertussis toxin in blood ($\beta = 0,47$), result streptococcus culture from the respiratory tract ($\beta = 0,38$), the level of sIgA in saliva ($\beta = - 0,21$).

Conclusions: 4 factors related with high risk of pulmonary complications of pertussis in 1 - 24 mon infants were identified.

ESPID-0302

NOVEL AND RAPID DIAGNOSTIC TOOLS FOR INFECTION PREVENTION IN POST-OPERATIVE WOUNDS

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Wound infection is a severe complication during wound healing that affects 5-10% of post-surgical wounds. We present different strategies for early detection of wound infection based on enzymes derived from the human immune system.
The enzyme activities of human neutrophil elastase (HNE), lysozyme, myeloperoxidase (MPO) and matrix metalloproteinases (MMPs) were directly monitored in wound fluids of affected patients (1). In addition, the gelatinolytic activity from both- MMPs and bacterial proteases were investigated for the development of a biopolymer based enzyme-responsive detection method. Infected wound fluids led to significant higher substrate conversion compared to non infected wound fluids or a clearly visible dye release in case of a dyed gelatin based device respectively. An electrochemical sensor for fast and simple detection of MPO activity as marker for infection was investigated. The MPO-chlorination activity - the formation of hypochlorous acid (HOCl) - in different wound fluids was used to differentiate between infected and non-infected wounds. To allow integration of sensors in typical bandage materials we successfully immobilized enzyme substrates on various surfaces. The substrates were converted only by infected wound fluids, thus allowing on-line monitoring of wounds due to different colour stages of the bandage.

There is a strong need for simple but effective sensor systems to determine infections in wounds. The combination of these rapid and simple diagnostic methods provide a powerful instrument for early detection of infection.

(1) A. Hasmann, E. Sigl, and G. Guebitz, Analysis of Myeloperoxidase in Wound Fluids as Marker for Infection, *Ann.Clin.Biochem*., 2011; 00:1-10.

ESPID-0303

POPULATION-BASED SURVEILLANCE OF ENTEROVIRUS INFECTIONS IN ENGLAND AND WALES, 2000-2011 AND THE IMPACT OF PCR BASED DIAGNOSIS

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Introduction: Enteroviruses (EV) are a major cause globally of severe sepsis like syndrome and meningo-encephalitis. The increasing availability and use of Polymerase Chain Reaction (PCR) as a diagnostic test could have a significant impact on diagnostic practices.

Objectives : Describe the epidemiology of laboratory-confirmed EV infections across all age groups in England and Wales with particular emphasis on the impact of changing diagnostic practices within National Health Service (NHS) laboratories.

Methods: Reports of laboratory-confirmed EV infections submitted by NHS laboratories in England and Wales during 2000-11 were analysed. Additionally, the Virus Reference Department (VRD) electronic database which contains typing data from 2004 onward was interrogated.

Results: Reported cases declined from a peak of 2,254 in 2001 to 647 in 2005, before increasing year-on-year to 1,633 in 2011. This rise coincided with increasing PCR based laboratory diagnosis, which accounted for 36% of reported cases in 2000 and 92% in 2011 of reported cases. The mean annual incidence was highest in <3 month-olds (153/100,000) who accounted for almost a quarter of reported cases (n=2993, 23%). Only 3921/13114 (30%) of the EV strains had a typing result over the 12-year period and the proportion of typed EV strains declined with age.

Conclusions : The apparent increase in reported cases closely reflects the rise in PCR-testing and is associated with a lower proportion of samples submitted for typing. Prospective studies linking burden of disease to serotype in neonates <3 month old are needed to define the apparent epidemiology of enterovirus disease and inform future treatment trials.

ESPID-0304

INFLUENZA VACCINATION COVERAGE IN CHILDREN WITH CHRONIC DISEASES. SEASON 2012-13. VALENCIAN COMMUNITY (SPAIN)

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Background and aim. The influenza disease and the risk of its complications produce an increase in the number of antibiotic treatments prescribed to children during the season. Vaccination coverage in children at risk is low in spite of the fact that hospitalizations by influenza disease in children <5 years are as high as in people >65. Aim: To analyze influenza vaccination coverage in children with chronic diseases aged 6 months-14 years during the 2012-13 influenza season.

Methods. A retrospective analytical study of coverages in children at risk aged 6 months-14 years has been done. Variables: age, gender, risk group. Data were obtained from the Vaccine Information System of the Valencian Community and Clinical registry of the patient (SIA).

Results. A total of 7722 children with risk factors were vaccinated, 4694 (60.79%) male. 7301 (94.55%) were children with cardio-respiratory disease; 421 (5.45%) immunosuppressed, diabetics, obese patients. According to the disease of children, the highest coverage was in diabetic disease [24.88 (CI95%: 22.82-26.94)]. The lowest in the group of respiratory disease [7.27 (CI95%: 7.10-7.44)]. Data by gender

are showed in Table 1.

Table 1. Influenza vaccination coverage by disease and gender

Disease	Gender	Coverage	95% CI	
Diabetes	Male	24.85	21.96	27.75
	Female	24.91	21.98	27.84
	Total	24.88	22.82	26.94
Cardiovascular	Male	11.75	10.7	12.81
	Female	10.49	9.41	11.56
	Total	11.16	10.41	11.92
Respiratory	Male	7.61	7.39	7.84
	Female	6.77	6.51	7.03
	Total	7.27	7.1	7.44

In diabetes, the highest coverage was registered in male aged 3-4 (34.29%); cardiovascular disease, in female aged 1-2 years(12.85%); respiratory disease, at the age of 10-14 years in female (8.46%).
Conclusions. Despite the highest mobility and mortality of the influenza disease in children with chronic pathologies, vaccination coverage is low. The lowest coverage was registered in children with respiratory disease. It is necessary to improve influenza vaccination in these groups.

ESPID-0305

REDUCTION IN COMMUNITY-ACQUIRED ALVEOLAR PNEUMONIA (CAAP) IN SOUTHERN ISRAEL AFTER PCV INTRODUCTION TO THE NATIONAL IMMUNIZATION PROGRAM (NIP)

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Background and aims: PCV7 was introduced to the Israeli NIP in mid-2009 and gradually replaced by PCV13 starting at end-2010. Our aim was to determine incidence dynamics of outpatients emergency room visits (Opt-ERV) and hospitalizations due to radiographically defined CAAP among children <5 years old following PCV introduction.

Methods: An ongoing prospective population-based study initiated in 2002 included all Opt-ERVs and hospitalized children with a WHO radiographically-diagnosed CAAP. Incidence reduction was calculated according to 3 periods: Pre-PCV (Jul-2002 to Jun-2008); PCV7 (Jul-2010 to Jun-2011); and PCV13 (Jul-2012 to Jun-2013), according to PCV7/13 uptake.

Results: Of 10,142 CAAP cases, 3,716 (36.7%) were Opt-ERVs and 6,426 (63.3%) were hospitalized. When PCV7 period was compared to pre-PCV period, a significant reduction was seen in Opt-ERVs, but no reduction was observed in hospitalizations (**Figure 1**). Following PCV13 introduction, both groups were reduced to an overall of 32% and 68%, respectively, when compared to pre-PCV period. All 3 age groups (<12, 12-23, 24-59m) showed similar patterns (**Figure 2**).

Conclusions: CAAP rates declined significantly after PCV introduction. Differences in rate reduction between hospitalized and outpatients in rates, age-specific responses and patterns suggested different serotype distribution.

Figure 1: Yearly outpatient ER visit and hospitalization incidences for CAAP in children <5 years, southern Israel, 2002-2013

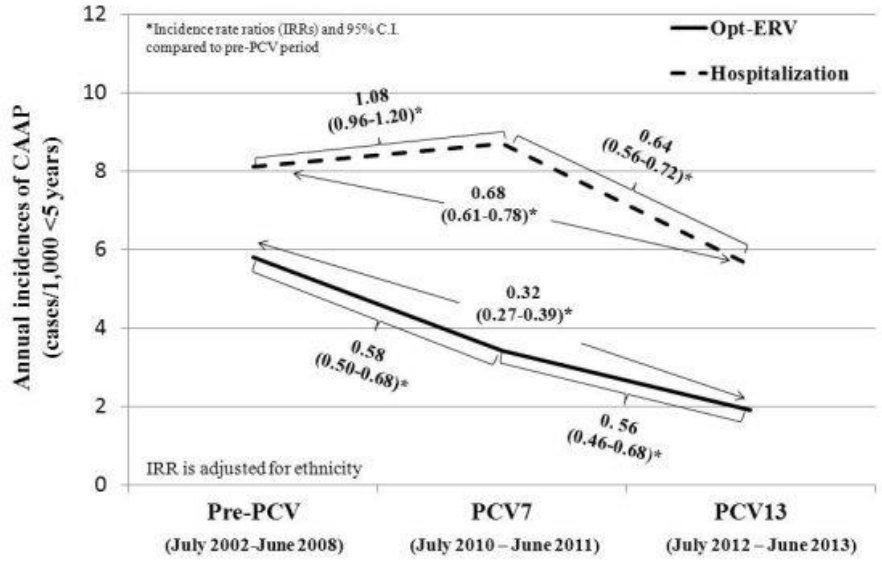
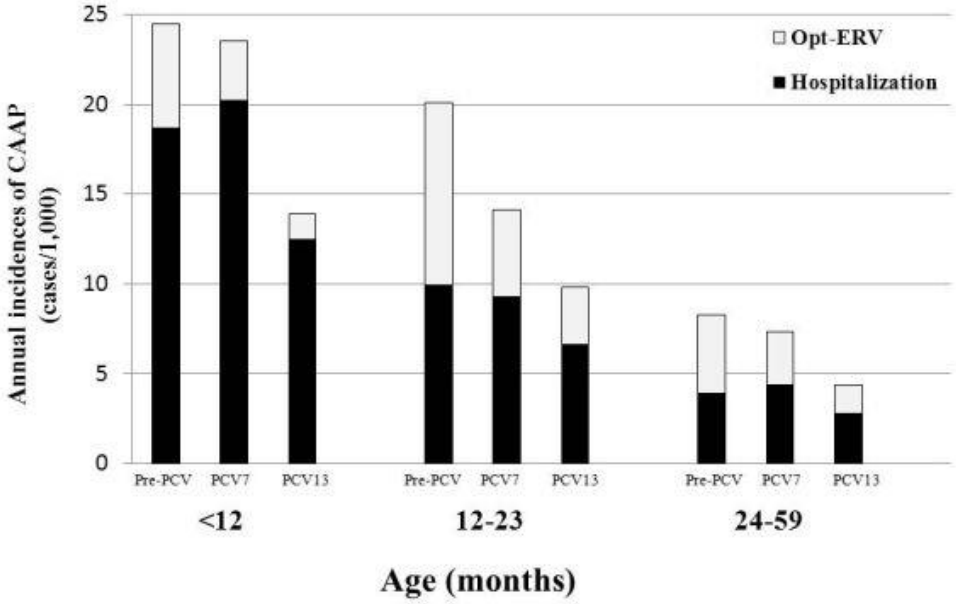


Figure 2: Incidences of outpatient ER visits and hospitalizations for CAAP in children <12, 12-23 and 24-59 months during Pre-PCV, PCV7 and PCV13 periods, southern Israel



ESPID-0306

CASES OF MEASLES IN CHILDREN IN GEORGIA

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Introduction: Last decade progress was made toward the goal of measles elimination in the World Health Organization European Region by 2010. However, since late 2009, measles virus transmission has increased, and outbreaks have become widespread. This year, Georgia has registered significant increase in the incidence of measles. Totally number of measles cases in Georgia in 2013 has reached 7750 people. 2420 (31%) of them were hospitalized. 3730 cases were registered in Tbilisi. 1269 (34%) of them were hospitalized. Mortality- in 2 cases. These data was released by the NCDC.

The purpose of this study is to review cases of measles with emphasis on its epidemiological peculiarities.

Methods: The cases of measles in children admitted at the Infectious Diseases, AIDS and Clinical Immunology Scientific Practical Center of Georgia between January and December 2013 were investigated retrospectively.

Results: Totally 673 patients (54% male) were registered. Age distribution: ≤ 1y – 167 patients; 1-4 y – 222 patients; 5-14 y – 150 patients, 15-19y– 134 patients. The outbreak started from the 12th to the 28th epidemiological week of 2013 with a peak on the 16th week after onset. Complications were found in 267 (39.6%) patients. Among complications pneumonia was found in 98.8%, encephalitis in 1.2%. Recovery was achieved in 100%.

Conclusions: Measles remains as an important problem for Georgia. The peak of incidence and hospitalization was found in spring. Among hospitalization children dominated age 1-4 y, however, among incidence – 5-14y. Most frequent complications were pneumonia.

ESPID-0307

TUBERCULOSIS MENINGITIS: REPORT OF TWO FATAL CASES

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Objectives

Tuberculosis meningitis represents 5% of extra pulmonary tuberculosis. It often arises from the pons, disseminates through the optic chiasm and affects the 3rd, 4th, 6th cranial nerves.

Materials and Methods

We hereby present two cases that presented in the terminal period and had a fatal course.

Results

Case 1, 3-years old girl admitted to the hospital with headache, fever, vomiting and anisocoria. Head CT showed hydrocephalus and cerebral calcifications. She underwent external ventricular drainage. CSF glucose was 36 mg/dL, CSF protein was 188 mg/dL. Past medical history revealed that she hadn't received the BCG vaccine. Chest CT showed calcific lymph nodes and parenchymal lesions. We started anti-tuberculosis treatment and steroid. She died on the seventh week of admission due to sepsis and multiorgan failure.

Case 2, 15-years old Syrian boy presented to the hospital with headache, somnolence and nausea. Cranial MRI showed scattered parenchymal lesions and hydrocephalus. On physical exam he had anisocoria. The patient didn't have the scar due to the BCG vaccine. Fundoscopic examination showed papilledema. He underwent external ventricular drainage. CSF glucose was 55mg/dL, CSF protein was 47mg/dL. He was started on anti-tuberculosis treatment and steroid. CSF culture revealed growth of *M. tuberculosis*. On his twenty-first day of admission he died of sudden cardiac arrest due to increased intracranial pressure.

Conclusions

Tuberculosis meningitis is a disease that is still not uncommon and it brings high mortality and morbidity. Both medical history and family history are important in children presenting with headaches, fevers, and altered sensorium.

ESPID-0308

RAPID IMPACT OF ROTAVIRUS VACCINE NATIONAL IMMUNIZATION PLAN (NIP) ON ROTAVIRUS GASTROENTERITIS (RVGE) IN SOUTHERN ISRAEL: COMPARISON BETWEEN JEWISH CHILDREN (JC) AND BEDOUIN CHILDREN (BC)

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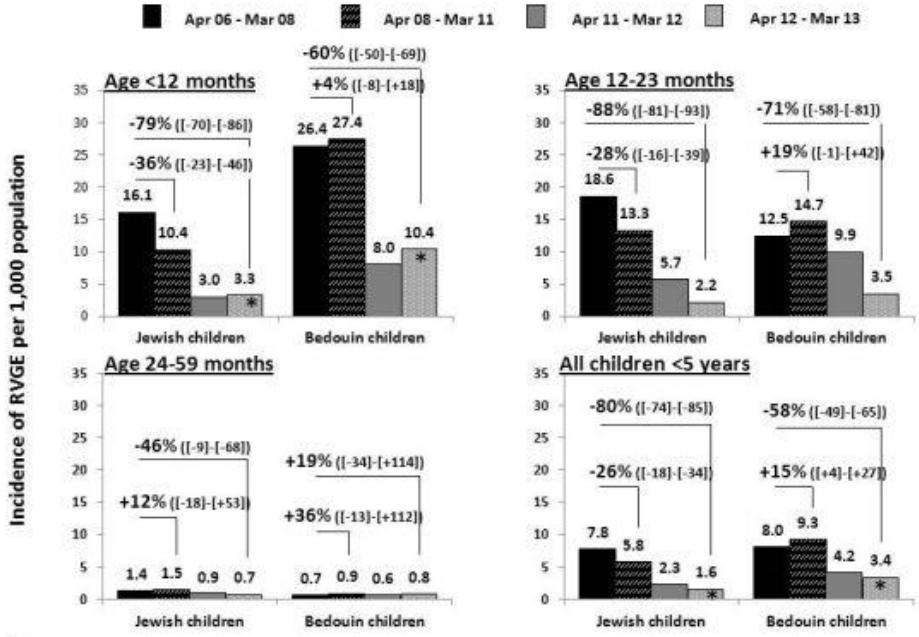
Background and aims: Southern Israel is inhabited by two populations: JC (resembling middle socioeconomic class) and BC (formerly desert nomads). The study aimed at comparing the impact of rotavirus vaccine NIP between JC and BC.

Methods: This prospective ongoing study was initiated on 04/2006 in the only hospital in southern Israel (allowing incidence calculation). All children <5y with vomiting/diarrhea of <7d were enrolled. Four periods were selected for analysis: 04/2006-03/2008 (period 1; no vaccination); 04/2008-03/2011 (period 2; ~25% uptake in JC [private market, either RotarixÒ (RV1) or RotateqÒ (RV5)] and no intake in BC); 04/2011-03/2012 (period 3; 1st year RV5 in NIP) and 04/2012-03/2013 (period 4; 2nd year of RV5 in NIP).

Results: A total of 3,305 RVGE hospital visits were studied (1,873; 56.7% BC). Vaccine uptake differed between JC and BC (**Figure 1**). Rate reduction (calculated as 1- incidence rate ratio) in children <5, in periods 2 and 4 (compared to period 1) were 26% and 80% respectively for JC; and -12% and 61% respectively for BC (**Figure 2**). Incidence reduction in period 4 was similar to period 3 for children <12 m; for children 12-23m, a further reduction occurred in period 4.

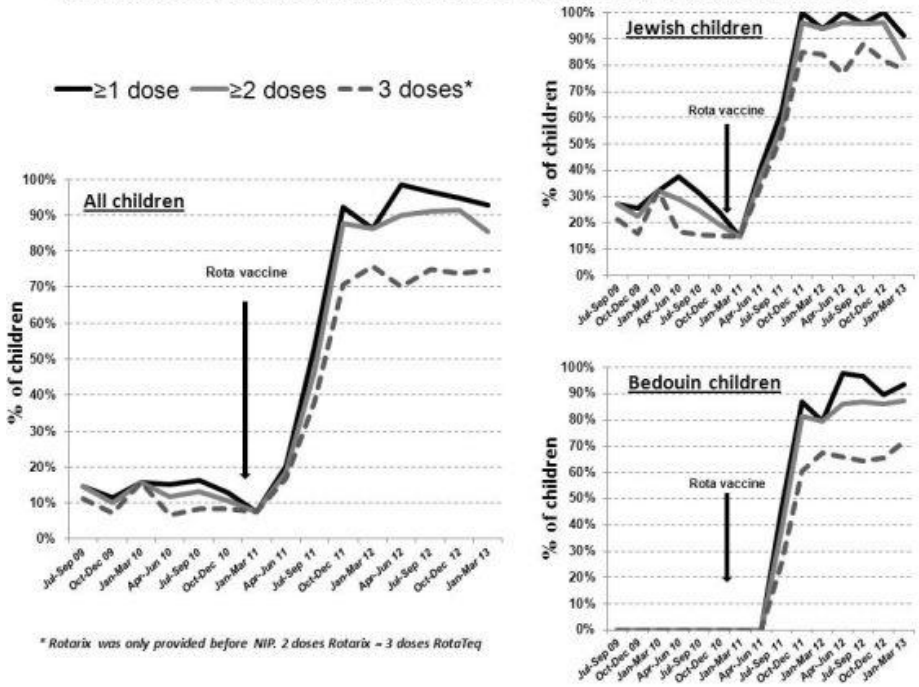
Conclusions: RVGE hospital visits were significantly reduced in both JC and BC. However the impact was faster and more profound in JC, in relation to both higher vaccine uptake and probably lifestyle differences.

Figure 1: RVGE Age-specific incidences during the 4 study periods, by age, study period and ethnic group (inpatients + outpatients)



* *P<0.001 Jewish vs. Bedouin children*

Figure 2: Rotavirus vaccine uptake for the period July 2009 through March 2013, children 8-11 months



* *Rotarix was only provided before NIP. 2 doses Rotarix = 3 doses RotaTeq*

ESPID-0309

EPIDEMIOLOGY OF CHICKENPOX IN A REGION WITH UNIVERSAL 2-DOSE VACCINATION, NAVARRE, SPAIN, 2012-2013

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BACKGROUND: Vaccination in Navarre was introduced in the childhood vaccination schedule in 2007 with two doses (15 months and 3 years)

AIM : The aim of this study is to describe the epidemiology of chickenpox in Navarre, Spain, in the period 2012-2013.

METHODS : Data were obtained from the automatic notification of electronic clinical reports of primary healthcare, with diagnose A72 (chickenpox) according to the International Classification of Primary Care, Second Edition (ICPC-2). Vaccination status of each case was obtained from the Navarre vaccination Registry.

RESULTS : Incidence of chickenpox was 22.28 cases per 100.000 inhabitants (97.3% lower than the pre-vaccine period). Although there was not a marked seasonality, the peak of cases occurred in weeks 13th to 16th.

In children under 15 years old, the incidence was 96.78 cases per 100.000 inhabitants.

21% of cases occurred in children under 15 months and 32% of cases in people over 15 years.

The peak of incidence occurred at 12-14 months, with 5.49 cases per 1000 inhabitants, corresponding with those who have not been yet vaccinated.

In the vaccinated cohorts, there have been registered 43 breakthrough cases (15% of all of the cases diagnosed in the period). 70% of breakthrough cases occurred after the first dose, and 30% in children with two doses of vaccine. The mean of days since vaccination for vaccine failure were 495.20 days (1.36 years) for one dose and 557.62 days (1.52 years) for two doses.

CONCLUSIONS: Chickenpox vaccine has lead to a change in the pattern of presentation of the disease.

ESPID-0310

IMPAIRED VISUAL FUNCTION IN CHILDREN UNDER 5 YEARS OF AGE TREATED WITH ETHAMBUTOL FOR A MYCOBACTERIAL INFECTION

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Introduction

Ethambutol side effects on vision are particularly difficult to detect in children under 5 years of age due to the lack of complaint and of objective clinical signs.

Aims

The aim of this study was to assess the frequency of visual abnormalities and the monitoring of visual function with visual evoked potentials (VEP) in children under 5 years exposed to ethambutol during an anti-mycobacterial treatment..

Methods

We performed a retrospective study in Robert-Debré University Hospital, Paris, France, including all children under 5 years of age who where treated for a mycobacterial infection with ethambutol between January 2002 and December 2012.

Results

14 patients were enrolled, including 13 treated for *mycobacterium tuberculosis* infection. The sex ratio was 1. The median age was 1.65 years [0.3 to 4.7]. 5 patients had a subarachnoid involvement. The median ethambutol dose was 22 mg/kg/day [15 to 27]. Only 11 patients were followed by VEP. 3 children (27.3%) developed a visual impairment secondary to ethambutol with a delay of 4, 7 and 36 weeks. 1 patient developed an impairment of retrochiasmatic visual pathways whereas the 2 others developed classical retrobulbar optic neuritis. In all cases, discontinuation of therapy resulted in a normalization of these abnormal findings.

Conclusions

Alterations of visual function related to the use of ethambutol are not uncommon in young children and are probably underestimated. Systematic close monitoring of the VEP is needed in children under 5 years initiating treatment with ethambutol.

ESPID-0311

'T.B SURE'. TUBERCULOSIS IN SOUTH EAST SCOTALND - A PREVALENT PAEDIATRIC PROBLEM

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Introduction: 'Phthisis', 'consumption', 'the white plague'; Tuberculosis remains a global issue killing over 1.8 million people each year.

Traditionally Scotland has had low levels of Tuberculosis. However, in 2009 there were 9.4 cases per 100,000 - rapidly catching up with the rest of Europe. An action plan for tackling TB in Scotland was published in 2011.

Methods: We reviewed the management of paediatric cases within SE Scotland over the last 5 years.

Results: 66 new paediatric cases were managed during 2008-2013.

This included 35 cases (53%) of latent TB and 31 (47%) cases of active TB. There were 2 cases of spinal, 1 skeletal and 2 miliary TB.

Age at diagnosis ranged from 3 months to 16 years old, the highest proportion being in the 1-5 year age group (n = 37).

All patients received a chest x-ray. 23 patients had an ELISA test, of these 9 were positive and 4 were indeterminate. HIV status was determined in all cases.

Only 4 patients had positive cultures for *Mycobacterium tuberculosis.*

The index case was unknown in 17 cases (26%).

Interestingly, 9 (14%) patients were Caucasian, British born with no history of travel outside the UK aside from European resort holidays.

Conclusions: From our data, we see that TB remains a prevalent problem in SE Scotland which clinicians should consider a relevant differential diagnosis, not only in ethnic populations or for those who have travelled to TB endemic areas.

ESPID-0312

ANALYSIS OF THE FREQUENCE OF ADVERSE EVENTS FOLLOWING DTAP AND TDAP IMMUNIZATION IN PEOPLE AGED 3-6 YEARS. VALENCIAN COMMUNITY (SPAIN). YEARS 2009- 2011

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Background and aim: The vaccination against diphtheria-tetanus-pertussis in Spain is established in a 5 doses schedule, at ages: 2, 4, 6, 15-18 months, 4-6 years. In 2010, the fifth DTaP dose was substituted with the Tdap vaccine. This change guarantied the immunogenicity of the vaccine and also reduced the reactogenicity.

The aim of the study was to analyze the reported adverse events following immunization (AEFI) related with DTaP and Tdap and evaluated the expected AEFI of each vaccine.

Methods: An analysis of the AEFI related with DTap and Tdap vaccine reported to the Vaccine Information System (SIV) of Valencian Community from 2009 to 2011 was done.

AEFI related with the fifth dose in people aged 3-6 years according to gender, vaccination centre and year was done. The model was the *Zero-inflated Poisson regresión*.

Results: It was administered a total of 97069 doses of DTaP vaccine and 53143 of Tdap during the study period. 150 AEFI were reported (131 DTaP, 19 Tdap). There were no statistical differences by gender or age.

The expected number of AEFI according to the model was: 0.168 (DTaP) and 0.036 (Tdap) for each 131 doses administered, with statistical differences.

Conclusions: According to the results the reactogenicity of the DTaP vaccine is higher than the Tdap. So the use of the Tdap vaccine in place of the DTaP for the fifth dose has been a good strategy for the vaccination program.

ESPID-0314

EARLY EXPOSURE TO VARICELLA ZOSTER VIRUS AND HERPES ZOSTER IN HEALTHY CHILDREN

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Background: Incidence rates of herpes zoster (HZ) progressively increase with age. HZ is unusual in children. It is frequent in children with cellular immune deficiency, however it may be seen in immunocompetent children. **Aim:**We report a case series of 17 healthy children who developed HZ. **Methods:** We report a case series of 17 children who diagnosed with HZ (10 boys, 7 girls). None of children with HZ had immunodeficiency and had received the varicella zoster virus vaccine. The mean age at presentation was 9,79 ± 3,9 years (range 4-17 years). **Results:** Eight children had been exposed to VZV in the first year of life. One children had been exposed to VZV in utero. Thoracic dermatome was the most common dermatome involved (n=9, 52,9%). Five children (29,4%) had lumbar, 2 children (11,7%) had cervical, and 1 children (5,8%) had sacral nerve involvement. The median age at onset of HZ was significantly lower in children who had been exposed to VZV in the first year of life than children who had been exposed to VZV after the first year of life (respectively, 6,6±1,8 years, 13,3±2,4 years, p=0,001). The interval between VZV and HZ was significantly lower in children who had been exposed to VZV in the first year of life than others (respectively, 6,0±1,7, 10,9±2,7 years; p=0,001). **Conclusions: V**aricella in the first year of life was a risk factor in immunocompetent children. HZ in children without immunosuppression was found not to be as mild as generally accepted.

ESPID-0315

INVESTIGATION OF THE OCCURRENCE OF RSV AND OTHER SIGNIFICANT ATYPICAL PNEUMONIA AGENTS IN THOSE PRESENTING WITH 'PERTUSSIS-LIKE' ILLNESS

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Background

Respiratory syncytial virus (RSV) is the most common cause of viral lower respiratory tract infection in infants and young children. Research has highlighted the difficulty of clinically distinguishing pertussis from RSV in young children.

Objectives and Aims

To investigate the occurrence of RSV and other significant atypical pneumonia agents in specimens received for *Bordetella* detection at a Dublin paediatric hospital.

Methods

350 'query pertussis' respiratory samples received at the Irish National Pertussis referral laboratory, Our Lady's Children's Hospital, Crumlin during 2012-2013 were chosen at random and tested for RSV, *Mycoplasma pneumoniae* and *Chlamydia pneumoniae* using the CE-IVD TrueScience Respifinder Identification Kit (Life Technologies) with analysis performed on the AB3500 DNA sequencer. Total nucleic acids were screened for *Bordetella pertussis* and *Bordetella parapertussis* by real-time PCR.

Results

B. pertussis and/or *B. parapertussis* DNA was detected in 14 of 350 respiratory specimens (age range 1 month - 29 yrs). All 350 samples were negative for *M. pneumonia* and *C. pneumonia* DNA using the Respifinder kit. A total of 87 samples were identified as positive for RSV A and/or RSV B (age range of 14 days – 6 yrs). Of the 275 specimens examined from patients <=3 yrs, 85 were positive for RSV.

Conclusions

More than 30% (85/275) of 'query pertussis' patient specimens received from patients <= 3 yrs were identified positive for RSV highlighting the difficulty of clinically distinguishing pertussis from RSV in young children.

Acknowledgements

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ESPID-0316

REAL-TIME PCR DETECTION OF BORDETELLA PERTUSSIS AND BORDETELLA PARAPERTUSSIS IN IRELAND IN 2011-2013

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Background: Pertussis (whooping cough) is an acute bacterial infection caused by *Bordetella pertussis*. From 2010-2012 pertussis notifications in Ireland increased significantly from 114 to >370 with 2 infant deaths attributed to pertussis infection in 2012. The laboratory at Our Lady's Children's Hospital, Crumlin, Ireland is the national referral lab for pertussis testing and routinely receives samples from hospitals and GPs nationwide.

Objectives and Aims: To investigate the proportion of *B. pertussis* and *B. parapertussis* in patient respiratory specimens received for query *B. pertussis* in 2013 as compared to 2011 and 2012.

Methods: Nucleic acid extraction from respiratory specimens was performed using the QiasymphonySP (Qiagen). *B. pertussis* and *B. parapertussis* detection was performed using real-time PCR analysis. PCR targets included *B. pertussis* IS481, *B. pertussis* toxin promoter and *B. parapertussis* IS1001.

Results: In 2011, the laboratory received 301 specimens of which 54 (17.9%) were positive for *B. pertussis* by PCR. In 2012, 126 of 1203 (10.5%) specimens tested were *B. pertussis* positive by real-time PCR. In 2013 (to end November only), the laboratory tested 771 query pertussis specimens of which 31 (4.0%) were PCR positive for *B. pertussis*.

Conclusions: Analysis of query pertussis requests indicates a genuine increase in clinical cases of query pertussis and an increase in specimens positive for *B. pertussis* during 2012. This is consistent with the episodic nature of *B. pertussis,* while the decreased number of cases in 2013 may also reflect the recent introduction of vaccination for teenagers.

Acknowledgements

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ESPID-0317

DEFECTIVE B-CELL MEMORY IN PATIENTS WITH DOWN SYNDROME

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Introduction: Patients with Down syndrome carry immunological defects as evidence by the increased risks for autoimmune diseases, hematological malignancies and respiratory infections. Moreover, the low numbers of circulating B-cells suggest impaired humoral immunity.

Objective/Aim: To study how the immune deficiency in Down syndrome results from immunological defects in the B-cell compartment.

Methods: We studied peripheral B-cell subsets, B-cell subset replication history, somatic hypermutation status, class switch recombination and selection processes in 17 children with Down syndrome. Tonsils from 4 children with Down syndrome were studied.

Results: Transitional B-cells were normal, but naive mature and memory B-cell numbers were reduced despite slightly increased serum BAFF levels. The relative number of germinal centre cells in tonsils was normal. $CD27^+IgD^+IgM^+$ "natural effector" B-cells showed reduced proliferation and somatic hypermutation levels, while these were normal in $CD27^+IgD^-$ memory B-cells. Furthermore, $IgM^+$and IgA^+, but not IgG^+, memory B-cells showed impaired molecular signs for antigen selection. The B-cell pattern was highly similar to that of common variable immunodeficiency patients with a defect in B-cell activation and proliferation. Still, Down syndrome patients had normal serum Ig levels and circulating plasma cell numbers.

Conclusions: Despite the reduction in memory B-cell numbers, systemic B-cell immunity seems sufficient. However, local IgA and IgM responses are important for mucosal immunity. The observed molecular defects selective defects in circulating IgA and IgM B-cell memory could reflect impaired local responses, which underlie the increased susceptibility to respiratory infections of patients with Down syndrome.

ESPID-0319

EXPLORING HEALTH INEQUITY POSSIBLY INDUCED BY PARTIAL REIMBURSEMENT OF THE ROTAVIRUS VACCINE IN BELGIUM

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Background and aims: In Belgium, all recommended infant vaccines are offered free of charge by the government. Except for rotavirus vaccination, implemented since October 2006 and reimbursed through a co-payment system, with a 25% contribution by the parents and 75% reimbursement by the health insurance system. We explored if this non-free-of-charge-system is responsible for the induction of vaccine access inequity among the Belgian infant population.

Methods: Among a Belgian rotavirus gastroenteritis (RVGE) hospitalized infant population, bivariate associations between either educational level of the mother or median income and outcome measures such as rotavirus vaccination status and missed vaccination opportunities were analysed. The significance of associations was assessed by two-sided chi-square test. The education of the mother and median income of the neighborhood are used as a proxy measure for socioeconomic status (SES).

Results: A total of 240 enrolled children (3-32 months of age) with PCR-confirmed RVGE were eligible for this analysis: 131 (54.6%) infants had received no rotavirus vaccine, 8 (3.3%) had been partially immunized, the remaining 101 (42.1%) had been fully immunized against rotavirus.

In case of a lower maternal educational level, there was an increased likelihood of incomplete rotavirus vaccination status, even though these children did receive the (free-of-charge) recommended DTP-doses.

	Rotavirus vaccination status **p-value**	**Missed vaccination opportunities** **p-value**
Education Mother n=230	**0.000123**	**0.002**
Median Income n=231	0.201	0.440

Conclusions: These results suggest that the current policy of co-payment leads to a certain degree of inequity in access to RV vaccines, especially for children with lower SES.

ESPID-0320

RISK FACTORS FOR LATE ONSET SEPSIS IN NEONATAL INTENSIVE CARE UNIT

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Introduction: The late onset sepsis (LOS) is invasive infection occurring in neonates older than 72 hours and affects approximatelly 10% of all newborns who are hospitalized in NICU.
Objective: to evaluate risk factors of late onset sepsis in Neonatal Intensive Care Unit.

Material and methods: This is clinical, retrospective-prospective study. Study group included 100 sick infants, preterm and term, who were hospitalized in NICU longer than 72hours, suspected to have systemic infection. Clinical and laboratory parameters potentially associated with infection were investigated.

Results: Systemic infection was confirmed in 54 infants with blood culture. Gram negative bacteria as a cause of LOS were slightly predominant; the most frequent was Klebsiella pneumoniae among gram negative, and coagulasa negative staphylococci among gram positive bacteria. Positive blood culture was significantly associated with birth weight (p<0, 01), Apgar score (p<0, 05), duration of mechanical ventilation (p<0, 05), duration of central venous catheter (p<0, 05), duration of hospitalization (p<0, 05) and total parenteral nutrition (p<0, 01). The model of logistic regression used to evaluate NOSEP score model, which consists of 5 independent variables (body temperature, platelets number, CRP, percentage of neutrophils, parenteral nutrition>14 days). Whole model was statistically successful (p<0, 01), with sensitivity 78%, specifity of 77% and positive predictive value of 81%. The best predictors within this model were variables CRP (p<0, 01) and total parenteral nutrition (p<0, 01).

Conclusion: Sick infants hospitalized in NICU may be the subject of LOS. Identification of predictors can help in prevention and early treatment of late sepsis.

ESPID-0321

FAMILY HISTORY OF TUBERCULOSIS (TB) IN A SELECTIVE NEONATAL BCG IMMUNISATION PROGRAMME: ARE WE ASKING THE RIGHT QUESTIONS?

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Background and Aims: In contrast to other western countries, the incidence of tuberculosis (TB) in the UK-born population, 4.1/100,000/year, has not declined in the past decade. The study aimed to determine the rate of identification of infants at risk by family history (FH) of TB and/or parental ethnic group, in a selective Neonatal BCG Immunisation Programme, according to local Guidelines.

Methods: A retrospective audit was conducted. Demographic data was collected for 474 infants born at Sunderland Royal Hospital during an 8 week period, 1/06/2013-25/07/2013. Parental ethnic group was determined from electronic hospital records. Infants were deemed to be at risk if one or both parents originated from a country with TB incidence ≥40/100,000. Documentation of a FH of TB was established from a manual search of infant records and deemed to be accurate if it encompassed a 5 year period, in accordance with NICE standards.

Results: Of the 474 infants, 32(6.8%) were at risk by parental ethnic group. 31(6.8%) of these were correctly identified and offered BCG immunisation. 425(89.7%) of infant records documented the presence or absence of a FH of TB, however, in only 17(4.0%) was this deemed to be accurate. 2(0.4%) infants received BCG immunisation based on FH alone, with the potential for missed immunisations.

Conclusions: An effective Immunisation Programme requires accurate screening questions. This occurred in only 4.0% of infants for whom a FH of TB was documented. Specific antenatal screening questions, matched to standards and linked to postnatal check documentation, are recommended to improve practice.

ESPID-0322

DISTRIBUTION OF HUMAN ROTAVIRUS GENOTYPES IN SEOUL, KOREA DURING 2009-2013: PREDOMINANCE OF G9P[4]GENOTYPE

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Introduction: Rotaviruses are the leading cause of acute gatroenteritis (AGE) in young children worldwide and rotavirus vaccines have been available in Korea since 2007. The frequently detected group A rotavirus genotype are G1P[8], G2P[4], G3P[8], G4P[8], and G9P[8]. Recently, increased prevalence of rare combination has been reported in some countries after the introdcution of vaccines.
Objectves: To investigate the changing pattern of rotavirus genotypes in children with AGE after the introduction of vaccines in Korea
Methods: Genotyping of rotaviruses was perfpormed on 201(12.2%) rotavirus positive samples collected from 1,147 children hopialized with AGE at Sanggyepaik Hospital between August 2009 and June 2013
Results: The most prevalent G genotypes were G9 (42.8%, 60 cases), followed by G1 (15%, 21 cases), G3 (14.3%, 20 cases), G4 (7.1%, 10 cases), G2 (6.4%, 9 cases), G10 (2.8%, 4 cases), mixed G-types (7.8%, 11 cases), and non-typeable (3.6%, 5 cases). The detected P genotypes were P[4] (54.3%, 76 cases), P[8] (30%, 42 cases), mixed P-types (14.3%, 20 cases), P[2] (0.7%, 1 case), and P[6] (0.7%, 1 case). The VP7 gens of G9 strains belonged to lineage III and clustered closely with the recently dected strains in Korea and Belgium by phylogenetic anlaysis. The predominance of G9P[4] was observed during 2011-2012 in Seoul, but G1P[8] was highly prevalent in 2013.
Conclusions: This study shows the predominance of G9P[4] after the introduction of vaccines in Korea, although it is uncertain that emergence of this combination might be due to the effect of rotavirus vaccine pressure.

ESPID-0323

URINARY TRACT INFECTION IN INFANTS <12 WEEKS OF AGE DISCHARGED FROM THE PEDIATRIC EMERGENCY ROOM (PER) WITH NORMAL URINALYSIS (NU)

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Aims: To characterize the clinical, microbiologic and therapeutic aspects of infants <3 months age with a positive urine culture (PUC) reported after discharge with NU.
Patients and methods: We enrolled all infants examined between 2004-2012 who had NU and UC performed during the 1st visit (V1), were discharged in good clinical condition w/o antibiotic therapy and were reported with a PUC.
Results: There were 255 and 393 PUC in infants <2 and <3 months of age, respectively. 46/393 (11.7%) had PUC following a NU at V1. Twenty (43%) and 42 (91%) were <1 and 2 months of age, respectively. *Escherichia coli* was isolated in 22 infants (48%). 15/46 (33%) infants had PUC at F/U visit (V2), with *E. coli* in 10/15 (67%); 11/15 (73%) infants with 2nd PUC were <1 month of age. The pathogens isolated in all 15 infants were identical between V1 and V2. Mean age of infants with PUC at both V1 and V2 was lower *vs*. infants with PUC at V1 only (26 .0±18.5 *vs*. 41.0±19.6 days, *P*=0.03). No differences were recorded in clinical presentation between infants with 2 PUC and infants with 1 PUC only. 27/46 (59%) of the infants were examined at V2 at PER; all were hospitalized and had sepsis w/u. None developed serious bacterial infections.
Conclusions: We propose a new diagnostic and therapeutic approach for infants <3 months of age with NU and PUC and suggest restricting the option of hospitalization and sepsis w/u at V2 only to infants <1 month of age.

ESPID-0324

IL-28B AS A PRE-TREATMENT PREDICTOR OF THERAPY EFFECTIVENESS IN CHILDREN WITH CHRONIC HEPATITIS C INFECTION

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Background and aims: Hepatitis C infection in children is mostly mild or asymptomatic but can lead to liver cirrhosis and hepatocellular carcinoma. Therapy consists of pegylated interferon and ribavirin. Early Viral Response (ERV) is associated with therapy effectiveness and is defined as an undetectable HCV RNA (cERV) or a greater than $2\log_{10}$ decline in HCV RNA (pERV) at week 12 of treatment. Polymorphism of IL28B (rs12979860) is thought to be a strong pre-treatment predictor of virologic response, particularly in adults infected with genotype 1HVC. The importance of that factor in children remains unknown.

The aim of the study was to assess the relationship between the polymorphism of IL28B and ERV in HCV infected children treated with PEG-INF+RIBA.

Methods and patients: The study included 12 children chronically infected (10 vertically infected) with HCV aged 6,5-17,3 years. Genotype (GT) 1HCV was present in 9 (75%), GT 4HCV in 2 (16,6%), GT 3HCV in 1 (8,4%). Polymorphism of IL-28B was as follows: CC, CT, TT.

Results: Polymorphism CC was in 9/12 (75%), CT in 2/12 (16,7%), TT in 1/12 (8,3%). High baseline viral load (>600000IU/ml) was in 10/12 (83%) children. cERV was present in 7/12 (58,4%)- among them 100% with CC, pERV was attained in 3 (25%): 2 with CC, 1- CT, decline of HCV RNA $<2\log_{10}$ was in 2 (16,6%): CT and TT.

Conclusion: The undetectable HCV RNA at week 12 of treatment was observed only in children with favourable IL28B: CC.

ESPID-0325

DENGUE FEVER IN A 12-YEAR-OLD POLISH GIRL: A CASE REPORT

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Background and aims:

Dengue fever is a mosquito-borne viral disease which is endemic in tropical and subtropical regions. It is an emerging infection in returning travelers.

We describe the clinical and laboratory findings of imported dengue fever in a teenager.

A 12-year-old girl returning from a trip to Sri Lanka was admitted to the hospital with a history of fever (up to 40C) of 3-day duration with concomitant headache with retro-orbital pain, arthralgia, myalgia, nausea and abdominal pain. She had been treated by GP with cefuroxime p.o. for 3 days for tonsillitis.

Her medical history was unremarkable, immunizations were up-to-date. She had not taken antimalarial chemoprophylaxis and had been exposed to mosquito bites.

On admission she was dehydrated. Findings on examination included a macular rash on the trunk, petechiae on the lower limbs and a palpable liver.

The laboratory tests revealed: leucopenia (3,0x10^3/mm3), thrombocytopenia (98G/l) and left shift (31% of band neutrophils). Rapid diagnostic test(Bio-Rad) for malaria was negative. The ultrasound examination showed hepatosplenomegaly. The hemodynamic parameters were stable. Normalization of the temperature was observed since the first day after admission.

History of a international travel and the clinical findings suggested the diagnosis of dengue, confirmed with ELISA test- IgM(+) and IgG(+).

The girl was treated symptomatically, recovered without complications.

Conclusions:

As there is no specific treatment for dengue, therapy is basically supportive and consists of early recognition of complications and appropriate fluid management. Travelers returning from endemic regions presenting with acute febrile illness should be screened for dengue.

ESPID-0326

STUDIES ON SAFETY AND EFFICACY OF POSTEXPOSURE PROPHYLAXIS WITH VALACYCLOVIR AGAINST VARICELLA EXPOSURES IN THE PEDIATRIC WARDS

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Background: Although the majority of children contracted of varicella recover uneventfully, varicella infection can cause a high morbidity and mortality in immunocompromised patients. As postexposure prophylaxis (PEP) in the inpatient setting, the proper dose of oral valacyclovir in this specific population has not been well documented.

Methods: We experienced eleven varicella outbreaks between April, 2009 and December, 2013 in the pediatric wards at the National Center for Child Health and Development in Tokyo and the St. Marianna University Hospital in Kanagawa, Japan. We used oral valacyclovir with different 3 doses (Group1: 90mg/kg/day q8h, Group2: 75mg/kg/day q8h, Group3: 60mg/kg/day q8h, max dose: 3g/day) as PEP. The therapy was immediately started after the exposure and the duration of therapy was 14 days.

Results: There were 296 patients exposed to varicella during the study period. The mean age of the patients was 4.5 years (range: 2 months-23 years). PEP was administered to 101 (34%) patients, and 85 out of 101 patients (84%) were immnocompromised. Valacyclovir was administered to 30 (10%) patients with 90mg/kg/day (Group1), 50 (17%) patients with 75mg/kg/day (Group2), 21 (7%) patients with 60mg/kg/day (Group3), respectively. Eighty-nine percent (76/85) of the immnocompromised patients also received concomitant immunoglobulin with valacyclovir. There was no case of secondary varicella infection nor adverse event among the patients who received PEP.

Conclusion: The use of oral valacyclovir as PEP for immnocompromised children was found to be safe and satisfactory effective with 60mg/kg/day. A larger study is necessary in the future to validate these findings.

ESPID-0327

SPECTRUM OF HEART INVOLVEMENT IN DENGUE VIRAL INFECTION IN CHILDREN

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Introduction: Dengue fever is one of the most significant re-emerging tropical diseases, despite our expanding knowledge of the disease, viral tropism is still not known to target heart tissues. There have been some previous reports of myocardial involvement in dengue, but this association has not been completely established.

Aims: The present study was conducted to evaluate cardiac involvement in dengue viral infection.

Methods: From July 2012 to March of 2013, patients hospitalized with dengue, confirmed through dengue nonstructural protein 1 and/or immunoglobulin M detection, were included in this study. Their troponin I and CPK-MB levels were determined. Patients with abnormal biomarkers underwent echocardiography.

Results: Twenty out of hundred patients with dengue viral infection presented with elevated biomarker levels. Compared to controls, they had higher leukocyte ($P < .001$) and platelet counts ($P < .001$). There was no difference according to clinical dengue classification; dengue hemorrhagic fever/dengue shock syndrome severity; duration of symptoms; or prevalence of secondary infection or co-infection between the 2 groups. Fifteen patients had sinus tachycardia, 2 had sinus bradycardia and one had complete heart block. Of the 20 patients who underwent echocardiography, depressed left ventricular ejection fraction (LVEF) was identified in 10 and left ventricular segmental abnormalities with preserved LVEF in 5. One patient died secondary to nosocomial sepsis in the myocarditis group.

Conclusions: Dengue viruses were shown to cause cardiac disease with clinical manifestations ranging from mild elevation of biomarkers to myocarditis. Presence of heart involvement in dengue viral infection is neither unusual nor fatal.

ESPID-0328

CHARACTERISTICS OF NON-TYPHOIDAL SALMONELLA BACTEREMIA COMPARING WITH SALMONELLA TYPHI BACTEREMIA IN UNDER-FIVE DIARRHEAL CHILDREN ATTENDING AN URBAN BANGLADESHI HOSPITAL

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Background and Aims: Although non-Typhoidal *salmonella* (NTS) bacteremia is much virulent than the Salmonella typhi bacteremia with higher mortality and morbidity especially in under-five diarrheal children, there is a paucity of contrasting data on the clinical characteristics between them. We sought to evaluate the factors associated with under-five diarrheal children with NTS bacteremia compared to those with Salmonella typhi bacteremia.

Methods: In this age-matched case-control study all the under-five children with NTS bacteremia admitted to the “Dhaka Hospital” of the International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b) between February 2009 and March 2013 were enrolled as the cases (n=20). Comparison was made among the patients with NTS bacteremia and randomly selected diarrheal patients with Salmonella typhi bacteremia as controls (n=60).

Results: Among the cases severe acute malnutrition (SAM) was significantly higher compared to those with controls (67% vs. 28%, p= 0.035). They are more often presented with shorter duration of fever [1.5 (0,4.75) vs 6 (4, 9.5) p=<0.001], severe dehydration (45% vs 12%, p=0.001), pneumonia (40% vs 8%, p=<0.001) and clinical signs of sepsis (45% vs 3%, p=<0.001) compared to the controls.

Conclusion: diarrheal patients with NTS bacteremia compared to Salmonella typhi bacteremia had higher case-fatality-rate. Diarrheal patients presenting with the short history of fever, SAM, severe dehydration, pneumonia, and clinical sepsis on admission are prone to have NTS bacteremia. Thus, clinicians in developing countries may use these simple clinical features associated with NTS bacteremia to initiate early treatment in order to curve the potential deaths from NTS bacteremia.

ESPID-0329

VANCOMYCIN DOSING IN TAIWANESE CHILDREN

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Introduction:
The goal ratio of the area under the curve/minimal inhibitory concentration (AUC/MIC) >400 is the best predictor of successful outcome. The aim of this study is to determine the best dosing strategy for vancomycin to achieve this goal and examine correlation between AUC and trough concentration in children.

Method:
Subjects aged 3 months to 18 years receiving Vancomycin were included between Jan 1 2010 and December 31, 2012. Vancomycin clearance (CL) was calculated using model designed by Le et al CL= 0.248 * Wt0.75 * (0.48/serum creatinine) 0.361 * (ln(age)/7.8)0.995. The AUC (mg-hr/L) was calculated by 24-hour dose (mg/kg/day)/CL(L/hr). The vancomycin trough concentration was categorized in to <5, 5-10, 10-15. 15-20 and >20 μg/mL. The vancomycin AUC was categorized in to <200, 201-400, 401–600 and >600 mg-hr/L.

Results:
A total of 180 patients were included. The median age was 3.77 year-old and median body weight was 13 kg. Only 9.4% of patients achieve the target trough range of 15–20 μg/mL, whereas 23.9% achieved the goal of AUC>400 mg-hr/L. The AUC was correlated well with trough level (rs=0.38, p<0.001) but not correlated to age (rs=-0.18, p=0.81). The serum trough level of vancomycin was significantly associated with age (p=0.028), daily dose (p<0.001), body weight (p<0.001) and serum creatinine (p<0.001).

Conclusion:
Our current dosing strategy was inadequate to achieve to goal of AUC/MIC>400 or tough>15. Additional studies of clinical outcomes and vancomycin pharmacokinetic parameters in pediatric patients are needed to modify current vancomycin dosing.

ESPID-0330

FATAL ASSOCIATION OF CHRONIC GRANULOMATOUS DISEASE AND ACQUIRED HEMOPHAGOCYTIC LYMPHOHISTIOCYTOSIS

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Background Chronic granulomatous disease (CGD) is a rare phagocyte disorder. Here we report a 9-year-old girl with CGD hospitalized for a liver abscess due to *Staphylococcus aureus* developed hemophagocytic lymphohistiocytosis.

Case: 9-year-old girl with CGD was admitted to our clinic for fever, wounds on legs and fatigue. She had been diagnosed as CGD by presence of skin abscess and the result of 0% of the nitroblue-tetrazolium **(***NBT***)** *test at age of one year old.*

Basic laboratory studies revealed leukocytosis (18,900/mm$^{3)}$ and elevated levels of C-reactive protein (291 mg/dL). Granulocyte suspension was given five times in consecutive days. CT showed that atelectasis on the right lower lobe, subdiaphragmatic fluid and heterogeneous, multilocular lesion in the liver. Surgical drainage was performed by laparotomy and 500 cc subdiaphragmatic abscesses were drained. Methicillin-resistant *Staphylococcus aureus* was isolated.

On the 28th day, the patient had hyponatremic convulsion and became hypoxemic. Splenomegaly, pancytopenia, hypofibrinogenemia, elevated ferritin level and hemophagocytosis on bone marrow aspiration were developed Intravenous immunglobulin and steroid treatment were initiated. She had focal convulsions. Cranial CT showed excessive subarachnoid hemorrhage. On the 34th day of admission, she died from multiple organ failure.

Conclusion: Chronic granulomatous disease can be associated with hemophagocytic lymphohistiocytosis. Physicians should therefore pay particular attention to this mortal complication.

ESPID-0331

LEUKOCYTE ADHESION DEFICIENCY PRESENTING WITH DIFFUSE NECROTIC SKIN LESIONS

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Background

Leukocyte adhesion deficiency is a rare autosomal recessive disorder of leukocyte function and is characterized by recurrent bacterial and fungal infections and depressed inflammatory responses despite striking blood neutrophilia. Skin infection may progress to large chronic ulcers that often require plastic surgical grafting. We hereby present a case of leukocyte adhesion deficiency with widespread necrosis of the tissues, which have seen promising results after plastic surgical grafting.

Case: 6 year old female patient diagnosed with leukocyte adhesion deficiency was admitted to our clinic for widespread necrotic skin lesions and sepsis. She had malodorous ulcerated lesion on each side of thoracic wall, left shoulder, left thigh, right gluteal region on physical examination. Broad spectrum antibiotic therapy (teicoplanin, meropeneme and fluconazole) was started. She had undergone surgical debridement after basic life support strategies for septic shock were held. Her wound swab cultures were positive for *E.coli* and *P.aeruginosa*. Graft surgery was performed 2 weeks after the debridement procedure. Wound care was done with regular dressing. She had complete recovery 45 days after admission.

Conclusions

Leukocyte adhesion deficiency is characterized by local progressive soft tissue infection. Untreated patients can result in septic shock. Supportive treatment, proper antibiotics early debridement and graft surgery can be life-saving.

ESPID-0332

DOES BIOFILM PRODUCTION IMPACTS HAEMOPHILUS INFLUENZAE ACUTE OTITIS MEDIA OUTCOME?

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Background: Non-typable *Haemophilus influenzae* is frequently associated with acute otitis media (AOM) treatment failures, recurrence or chronic otitis media. Persistence of otopathogens in a biofilm-structured community was implicated in these situations. Here, we compared *in vitro*, the biofilm production by *H. influenzae* strains obtained from middle ear fluid (MEF) culture of children with AOM treatment failures to that produced by strains isolated from the nasopharynx (NP) of healthy children or with AOM.

Methods: Using a modification of the microtiter plate assay with crystal violet (CV) stain, the production of biofilm was determined in for 216 *H. influenzae*: 41 strains from MEF, 43 strains from NP of healthy children, 88 strains from NP of children with a first episode (43) or recurrent (45) AOM without conjunctivitis and 44 from NP of children with AOM associated with a conjunctivitis.

Results: The production of biofilm was 106/216 (49%) for overall *H. influenzae* strains and 26/43 (60.5%) of strains isolated from NP from healthy children. The comparison of the production of biofilm between strains isolated from MEF samples and those from NP samples do not show any significant difference. The ampicillin resistance of *H. influenzae* by a modification of their penicillin binding proteins (PBP) (BLNAR strains) was significantly associated with a lower production of biofilm (p = 0.029). Also, the presence of conjunctivitis was significantly associated with a lower production of biofilm (p = 0.001, multivariate analysis).

Conclusion: Surprisingly, there was no correlation between the production of a biofilm by HI and the outcome of infection as less than 50% of the strains produced a biofilm, However, *H. influenzae* strains associated with an otitis-conjunctivitis syndrome produced less biofilm as strains with PBP modification, conferring ampicillin resistance.

ESPID-0333

ACTIVE IMMUNIZATION IN PRESCHOOL CHILDREN IN BITOLA IN THE PERIOD OF 2008 TO 2012

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ACTIVE IMMUNIZATION IN PRESCHOOL CHILDREN IN BITOLA IN THE PERIOD OF 2008 TO 2012

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Introduction: Active immunization in our country is compulsory against tuberculosis, diphtheria, tetanus, pertuses, poliomyelitis, measles, parotitis, rubeola, hepatitis B and hemophylus influenza tip B.

Aims: The aim of the study is to evaluate the comprising of preschool children till 5 years with vaccination in Municipality of Bitola and to determine the success of vaccination.

Materials and methods: In retrospective epidemiological study the vaccination data were analyzed in the period of 2008 to 2012.

Results: With HB vacine were comprised 98,24-99,46% of children. With primovaccine DTP (three doses) were comprised from 91,11 to 99,44% of children, with first revacination the comprising was 98,53 to 99,44%, and with second revaccine 93,34-98,66%. With primovaccine OPV were comprised from 91,11 to 99,44%, and with revactination 98,53-99,44% of the children. Vaccine against Hepatitis B in Macedonia was introduced in september 2008 when with the primovacine were comprised from 91,53 to 98,00% and with revacine from 47,22-96,71% of children. With vaccine against MMR were vaccinated from 98,97-100% of children.

Conclusion: In Municipality of Bitola the percentage of performed immunization in preschool was over 90%with some variations during years. In order to achieve complete comprising of children with compulsory vaccination, very important is health education of parents.

Key words: active immunziation, preschool children, Macedonia

ESPID-0335

AN UNUSUAL MULTI-SYSTEMIC INFECTION IN A PAEDIATRIC RENAL TRANSPLANT RECIPIENT

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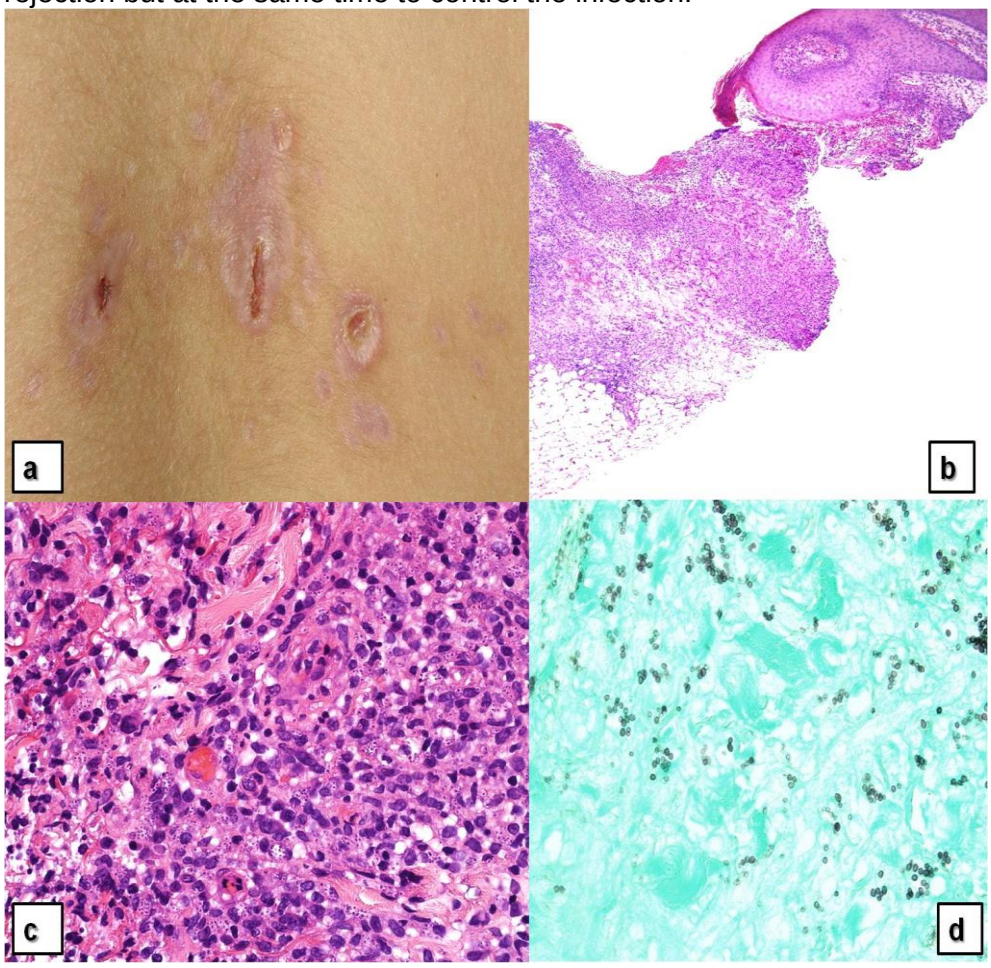
An 11 year old male with history of renal transplantation 9 years ago presented with a 2-month history of persistent dyspnoea, rash (figure 1a), malaise, weight loss and night sweats. He first developed the rash whilst travelling in Cuba, followed by the other symptoms within few weeks. A diagnostic work-up including chest x-ray, CT-chest, bronchoalveolar lavage and skin biopsy (figure 1b, 1c, 1d) led to a diagnosis of disseminated histoplasmosis infection involving the chest, the skin and the transplant kidney. Diagnosis was confirmed by positive *Histoplasma capsulatum* serology. He was admitted, had reduction in immunosuppressive therapy and after initial empiric antibiotic and antifungal treatment he subsequently received intravenously liposomal amphotericin B for 5 weeks with rapid symptom-resolution. He is on lifelong itraconazole suppressive therapy.

This is the first case of histoplasmosis in a paediatric renal transplant recipient as per our knowledge in the UK. Our case highlights the need for multidisciplinary involvement and multiple investigations to effectively make a diagnosis of histoplasmosis in immunosuppressed patients, in whom the sensitivity of the different tests is lower. This case report increases awareness about the condition for clinicians working in low incidence areas of the world. In this particular group of patients it is difficult to establish a balance between antimicrobial treatment and immunosuppression, in order to maintain the renal allograft function without organ

rejection but at the same time to control the infection.



ESPID-0337

ISOLATION OF RSV OR INFLUENZA A OR B IN PATIENTS WITH SEVERE EXACERBATION OF BRONCHIAL ASTHMA

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iINTRODUCTION:
Prevalence of asthma is increasing. Asthma exacerbations are the leading case of hospitalization and asthma related mortality.
OBJECTIVE:

To assess the association of isolation of respiratory syncitial virus (RSV) or influenza virus from nasopharyngeal aspirate with severe exacerbation of bronchial asthma.

METHODs:

Prospective observational study in a tertiary care hospital in North India. Children aged 6 months to 15 years presenting with acute exacerbation of bronchial asthma were enrolled. Severity of asthma exacerbation in was ascertained using GINA 2007 classification. Nasopharyngeal aspirates were obtained at the time of admission and RSV and influenza A, B virus RNA was detected using rtPCR. Venous blood (2ml) was taken for estimation of total serum IgE levels by ELISA.

RESULTS:

From August 2012 to August 2013 of 80 patients enrolled, out of which 21(26.25%) were in severe exacerbation and 59(73.75%) were with mild or moderate exacerbation. RSV was found in 24/80(30%) cases and influenza in 8/80(10%) of cases. Severe asthma exacerbation were associated with either RSV or influenza detection (OR-4.8, 95% CI-1.09-7.17, p value-0.02) and had a longer duration of hospital stay (109.19±41.49 hours in virus positive vs 49.2±38.95 hours in virus negative cases).

CONCLUSIONS:

Since RSV/influenza isolation in nasophayngeal aspirates is associated with severe acute exacerbation of bronchial asthma, primary prevention strategies against these viruses must be taken/evolved.

ESPID-0338

PLATELET MASS PREDICTS INTRACRANIAL HEMORRHAGE IN NEONATES WITH GRAM-NEGATIVE SEPSIS

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Introduction: Neonatal Gram-negative sepsis (GNS) is often associated with severe thrombocytopenia and life-threatening intracranial hemorrhage (ICH).

Objectives: We investigated the prognostic significance of platelet mass (PM) to predict neonatal ICH at the onset of GNS.

Methods: Demographics, microbiology, antimicrobial susceptibility, PLT number/ PM during the first 3 days after the diagnosis of GNS, prothrombin time, partial thromboplastin time, ICH occurrence and outcome were retrospectively recorded during the period 2005-2012.

Results: Eighty-four GNS episodes occurred in equal number of neonates (54.8% females) with median gestational age 30 weeks (IQR 4.5), median birthweight 1481.5g (IQR 972.5) and median age at diagnosis of sepsis 23 days (IQR 33). The three most frequently isolated bacteria were *Enterobacter* (38%), *Klebsiella* (33%) and *Pseudomonas* (8%) species. ICH was recorded in 16/84 (19%) of GNS, and the all-cause mortality rate was 21/84 (25%). The type of Gram-negative bacteria was not significantly associated with the presence of ICH (*p=0.45*). The median PLT number and PM at day 1-3 after GNS diagnosis were significantly associated with the presence of ICH. Regression analysis with ROC curve revealed the cut-off predictive value 355 fl/nl of the PM at day 3 (AUC: 75, sensitivity 90%, specificity 44.8%, *p = 0.02*).

Conclusions: PM at the onset of neonatal GNS may play an important role in promptly predicting the presence of ICH. Prospective analysis of prognostic risk factors in neonatal GNS is needed.

ESPID-0339

IMPLEMENTING BEST PRACTICES FOR CHILDHOOD VACCINATION PAIN MANAGEMENT

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Introduction: Little attention has been paid to minimizing pain during childhood vaccination which is the most frequent adverse event following immunization. This lack of pain management exposes children to unnecessary suffering and the potential for long-term consequences. To address this important care gap an inter-disciplinary team, Help ELiminate Pain in KIDS Team (HELPinKIDS) was convened in Toronto, Canada, in 2008.

Objectives: 1. Identify relevant stakeholders involved in childhood vaccination.
2. Increase awareness of the need to manage pain.
3. Produce knowledge syntheses of evidence-based pain management interventions.
4. Develop a national clinical practice guideline and educational tools for clinicians and parents.
5. Integrate information about pain in national immunization education and processes of care.
6. Measure impact on health care delivery.

Methods: 1. Focus group and individual interviews
2. Quantitative surveys and Systematic reviews
5. Guideline creation
6. Observational studies
7. Randomized trials

Results: HELPinKIDS has provided evidence-based knowledge synthesis and practice tools such as a clinical practice guideline (CPG), videos and pamphlets showing:
1. 60% increase in utilization of analgesic strategies by public health nurses (n = 2239).
2. 60% increase in utilization of analgesic strategies by parents after reading pamphlet (n = 436).
3.100% increase in utilization by parents of the most effective analgesic strategies (breastfeeding, topical anesthetics, or sugar water) (n = 174).

4. 5%increase in H1N1 vaccination by hospital employees after provision of analgesia (n=392).

Conclusion: HELPinKIDS has had a measurable impact on what we know about pain and the implementation of pain management strategies during vaccine injections.

ESPID-0342

HUMAN BOCAVIRUS PRESENCE IN HOSPITALIZED CHILDREN WITH ACUTE RESPIRATORY TRACT INFECTIONS IN LATVIA

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Background and aim
The aim of this study was to determine the presence of human bocavirus (HBoV) in hospitalized children less than six years old with acute respiratory tract infections in Latvia and describe clinical features of the disease.

Materials and Methods
The nasopharyngeal aspirates were collected prospecitively in season 2012/2013. The nasopharyngeal aspirates were taken from children less than six years old presenting with acute respiratory tract infection, who were hospitalized in Children's Clinical University Hospital from November 2012 to May 2013. To compare the data, we used a collection of nasopharyngeal aspirates from season 2011/2012. DNA was isolated from all samples and screened for HBoV genomic sequences using polymerase chain reaction.

Results
The 71 nasopharyngeal aspirates were collected, HBoV DNA was found in 39% (28/71) of the samples - 14 in each season, respectively. Co-infection with other viruses was observed in 11% (3/71) of patients infected with HBoV. The detection rate was highest in 0 – 6 and 12 – 24 month old children and was 31% (22/71). The most prevalent symptoms in HBoV positive patients were cough (100%), rhinitis (96%) and fever (82%).

Conclusions
HBoV is present in hospitalized children with acute respiratory tract infections including lower respiratory infections in Latvia. To clarify the pathogenic role of HBoV further studies are required.

ESPID-0344

NEBULIZED FLUTICAZONE FOR CROUP

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Introduction: Croup or acute laryngotracheobronchitis is the most common cause of the upper airway obstruction. Nebulized racemic epinephrine or budesonide are commonly used for therapy. No studies using nebulized fluticasone in the community have been published in order to determine whether such treatment would improve symptoms, or reduce the inpatient stay.
Aims: The aim of the present study was to determine whether nebulized fluticasone improves the symptoms or shortens the duration of stay of children admitted to hospital with a clinical diagnosis of croup.
Methods: A prospective, randomized, open labeled, controlled trial. 96 children aged 7–148 months with Westley score 2-5 entered the study. All children received nebulized fluticasone propionate. The main outcome measures were duration of inpatient stay and “Westley scores” at 6, 12, and 24 hours.
Results: Nebulized fluticasone propionate was associated with a significant improvement in symptoms at 12 hours (95% confidence interval (CI) 0 to 2) and 24 hours (95% CI 0 to 1). Patients with an initial Westley score above 3 demonstrated a significant improvement in symptoms at two hours (95% CI 1 to 3). Nebulized fluticasone was also associated with a short inpatient stay.
Conclusions: Nebulized fluticasone propionate is an effective treatment for children admitted to hospital with a clinical diagnosis of croup.

ESPID-0345

EMERGING MRSA INFECTIONS IN CHILDREN –EXPERIENCE FROM A TERTIARY CARE CENTRE, INDIA

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EMERGING MRSA INFECTIONS IN CHILDREN– EXPERIENCE FROM A TERTIARY CARE CENTRE, INDIA

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BACKGROUND: Methicillin resistant staphylococcus aureus (MRSA) is an important emerging infection in children in developing countries. Initially it was isolated mainly in health care settings, now increasingly being reported from the community as well.

AIMS: To study the prevalence, clinical profile and antibiogram of MRSA in children.

METHODS: This is a retrospective analysis of Staphylococcus aureus isolates from clinical specimens in children between the ages of 0-18yrs from May 2009 to December 2013, done at Manipal Hospital, Bangalore, India.

RESULTS: In 880 staphylococcus aureus isolates, 282(32%) were MRSA. Among MRSA infections, it was most common in the age group of 1-5yrs (34%). Skin and soft tissue infections being the most common site of isolation(64.89%). Invasive MRSA was seen in 23(8.15%) cases.Among the MRSA isolates, 89.7% were community acquired (CDC criteria). Resistance for Clindamycin was seen in 81(28.7%), cotrimoxazole in 82(29%), Ciprofloxacin in 146(51.7%), gentamycin in 122(43.2%), erythromycin in 135(47.8%) tetracycline in 9(10.1%). Of 115 isolates only 3 were borderline resistant to tigecycline. No resistance was noted to daptomycin out of 42 cases.All isolates were sensitive to Vancomycin and linezolid.

CONCLUSION: High incidence of community acquired and invasive MRSA was noted. Increasing resistance to ciprofloxacin and cotrimoxazole and erythromycin was noted in the study period. Skin and soft tissue remains common site of infection. Resistance to commonly used affordable oral antibiotics makes the treatment expensive in resource poor countries.Identifying MRSA strains on culture,regular local antibiogram will help clinician to know the pattern of sensitivity for better management.

ESPID-0346

ATTITUDES OF IRISH MOTHERS TO THE NATIONAL 'WHOOPING COUGH' VACCINATION RECOMMENDATIONS: THEIR KNOWLEDGE CLINICAL PERTUSSIS AND IMMUNITY AMONG HOUSEHOLD CONTACTS

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Introduction: The recent increase in neonatal pertussis cases has prompted the National Immunization Advisory Committee (NIAC) to recommend the Tdap vaccine for women at 28-32 weeks gestation or to women in the immediate post-partum period.

Objectives: Aims of this study were (1) to assess maternal knowledge of clinical pertussis infection, (2) to determine vaccination status of immediate newborn household contacts, and (3) to determine maternal attitudes towards the recent NIAC recommendations.

Methods: Knowledge, immunity and attitudes were determined via a prospective questionnaire-based study involving mothers on the ante- and post-natal wards of University Hospital Galway. Knowledge of clinical pertussis was determined via a series of questions, 1 point for each correct answer, maximum score of 10. Relevant socio-economic demographics were also recorded. Statistical analysis was performed using SPSS 21.

Results: 240/265 mothers completed the survey. The average knowledge score was 4.6/10 (SD±2.46), statistically higher among those with higher education level, ($p < 0.02$). Concerning mothers and adult household contacts, only 6/240 and 3/263 respectively had received a recent (within 10 years) pertussis-containing vaccine; 114/121 children <5 years were up-to-date. Regarding maternal attitudes to immunization, 65.4% of respondents were willing to receive the Tdap booster during gestation, 81.2% postpartum.

Conclusion: Maternal knowledge of pertussis infection was poor with decreased awareness of key clinical knowledge and vaccination recommendations for both adolescents and pregnant women Most respondents and adults household contacts were likely 'at risk' to develop clinical pertussis. There was an overall acceptance of the recent NIAC recommendations concerning maternal pertussis vaccination.

Table 1: Vaccination Status of Adults in Immediate Household, total 503

	N (%) of subjects			
	Vaccination < 10 years ago	**Vaccination >10 years ago**	**No Vaccine**	**Not Sure**
Mothers & expectant mothers *(n=240)*	6 (2.5%)	167 (69.2%)	5 (2.1%)	63 (26.3%)
Other immediate household contacts *(n=263)*	3(1.1%)	171(65.0%)	---	89 (33.9%)

Table 2: Vaccination Status of Children in Immediate Household, total 193

	No. (%) of subjects			
	Up to date	**Not up to date**	**No Vaccine**	**Not Sure**
<5 years old *(n=121)*	114 (94.2%)	5 (4.1%)	2 (1.7%)	--
5-11 years old *(n=56)*	43 (76.7%)	6 (10.7%)	--	7 (12.5%)
12-18 years old *(n=16)*	10 (62.5%)	--	--	6 (37.5%)

Table 3: Maternal Attitudes towards New NIAC Pertussis Vaccination Recommendations, total 243

	No. (%) of subjects		
	Yes	**No**	**Not Sure**
Willingness to receive Tdap at 28-32 weeks	157 (65.4%)	41 (17.1%)	42 (17.5%)
Willingness to receive Tdap after birth	190 (81.2%)	12 (5.1%)	32 (13.7%)

ESPID-0347

IMMUNOGLOBULIN E AND INTERLEUKIN-4 LEVELS IN BLOOD OF CHILDREN WITH CROUP, RECURRENT CROUP AND ASTHMA

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Background. Some children with croup have multiple episodes of croup (recurrent croup). The cause of recurrent croup is unknown; viral infections, allergy, and psychological factors have been suggested. High incidence of a history of croup was found in children with asthma.

Aims. To reveal if there is evidence of relationship between croup and asthma we evaluated levels of allergy associated substances (IL-4 and IgE) in children with croup, recurrent croup and asthma.

Methods. In this study were enrolled 88 children (30 with croup, 28 with recurrent croup and 30 with asthma) and 75 healthy controls. Serum total IgE and IL-4 were measured by ELISA. Blood samples were taken after 2 weeks of asthma exacerbration or croup episode.

Results. The highest levels of IL4 and IgE were registered in children with asthma. Minimal levels were in children with croup. Patients with recurrent croup had intermediate concentration of IL-4 and IgE in plasma (Table).

Table. Characteristics and IL-4 and IgE levels in patients and control subjects (±SD)

Groups	IL-4 pg/ml	IgE IU/ml
Croup, n=30	10.5±2.7	55.0±36.7
Control, n=25	7.0±2.3	16.4±10.7
P	<0.05	<0.05
Recurrent croup, n=28	14.8±4.4	171±163
Control, n=25	7.5±2.5	30.6±20.5
P	<0.05	<0.05
Asthma, n=30	42.0±20.4	422±382
Control, n=25	7.0±2.4	29.6±20.5
P	<0.005	<0.001

Conclusion. The high levels of IgE and/or IL-4 in children with recurrent croup indicates the presence of an allergic component in this disease.

ESPID-0348

THE DETECTION OF WILD POLIOVIRUS IN ENVIRONMENTAL SAMPLES IN ISRAEL AND THE FOLLOWING PUBLIC HEALTH INVESTIGATION AND RESPONSE

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Background and aims: In June 2013 Israel reported to the World health Organization on isolation of wild poliovirus type 1 (WPV1) in sewage samples from southern Israel. The virus has been detected in sewage only; no case of paralytic polio has been reported. Israel was certified polio-free in 2002, along with the members of WHO-EURO. The national vaccination program includes (since 2005) IPV at 2,4,6,12 months and 7y. IPV3 vaccination coverage (2012) was 95%.

Methods: The response measures included: enhanced environmental and clinical surveillance, public health education and mass polio immunization campaigns.

Results: The clinical surveillance: acute flaccid paralysis (AFP) and aseptic meningitis (all WPV1-negative) and a stool survey in southern Israel (4.2% WPV1 positive, mainly children 0-9y).

The immunization campaigns included several stages: In June-July 2013, a nationwide IPV catch-up, focusing on southern Israel and achieving >98% coverage among children. In August 2013 a bivalent OPV (types 1 and 3, bOPV) campaign was launched, with a single bOPV dose if previous IPV dose is documented. The campaigns were monitored on a daily basis via the national immunization coverage registry. The target population included initially 180,000 children <10y in southern Israel and eventually 1.2 million children <10y in Israel (coverage: 90% southern Israel, 80% nationally). From 2014 the national vaccination program will include bOPV (6 and 18 months) in addition to IPV.

Conclusions: The control measures were timely and effective, with no cases of paralytic polio despite sustained transmission of WPV1. The ongoing immunization coverage monitoring provided essential data.

ESPID-0350

MOLECULAR ANALYSIS OF HBV IN MOTHERS-CHILDREN PAIRS IN GREECE

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Background Vertical transmission of hepatitis B virus (HBV) is a primary infection **source for infants, but** little is **known on the proportion of children that have acquired HBV from their mothers.**

Objective In this study we investigated the relationship of HBV sequencing in children and in their HB positive mothers and explored the phylogenetic tree of HBV virus in children in Greece.

Methods Serum-extracted HBV-DNA from 13 mother-child pairs (13 children - 9 mothers) and 16 further unpaired children was amplified by polymerase chain reaction and the target region HBV surface glycoprotein (aa 40-171) was directly sequenced. Following editing and alignment of these sequences, phylogenetic tree analysis was performed using the neighbour-joining and maximum-likelihood methods.

Results Analysis was successfully performed in 29/38 subjects. All individuals were infected by HBV genotype D. Subtype was identified in 29 subjects (23 children and 6 mothers), with adw3 being the most common (21, 72.4%), followed by ayw2 (4, 13.8%) and ayw3 (4, 13.8%). Among 6 mother-child pairs with successful HBV sequencing, 3 had identical subtype, and 3 had different subtypes.

Conclusion Our findings suggest that HBV subtypes in infected children are often identical to their mother's, although different strains are not rare and point to non-vertical HBV transmission in childhood.

Acknowledgements. The study was supported by a University of Crete Grant (ELKE KA2508).

ESPID-0351

COMMUNICATION THROUGH NEW MEDIA: THE POWER OF STORYTELLING. EXPERIENCE OF VACCINEWSNET

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Introduction and aims: Vaccines, often seen as one of the greatest public health interventions, are recently losing a certain degree of public confidence. With 80% of Internet users searching for health information online, the Internet and social media are an important stakeholder in vaccines communication. HCPs provide solid health information with statistical data, analytical clinical trial results and large-scale effectiveness and/or impact data. This way of communication appeals to logic and reason but fails to reach the majority of parents. According to some researchers storytelling can bridge this gap.

Methods and results: VacciNewsNet (VNN) is one of the most successful social media platforms to provide pro-vaccination information to the public, media, HCPs and policy makers. VNN is reaching >130,000 persons/week via Twitter (112,000 followers), Facebook (5,000 followers), Google+ (2,000 followers), Instagram (13,000 followers).

We reviewed the messages posted via the VNN platform from July 1st, 2013 to December 31st, 2013. Messages presented in stories, pictures and/or infographics are two to five times more often liked and/or shared as messages presented in a scientific and evidence-based way. As a consequence these messages were reaching a smaller audience. Some of the contacted followers told us that they even failed to understand the more scientific/statistical health information. The messages presented as a story resulted in more lively discussions in the different social media platforms.

Conclusions: HCPs should include stories when communicating with parents about immunization education.

ESPID-0353

CHARACTERISTICS OF COMPLICATED AND UNCOMPLICATED COMMUNITY ACQUIRED PNEUMONIA IN HOSPITALIZED CHILDREN IN SINGAPORE

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Introduction

Community acquired pneumonia (CAP) is a common paediatric infection, associated with significant morbidity and mortality.

Objective/Aim

To compare the characteristics of children hospitalized with complicated and uncomplicated CAP in Singapore.

Methods

In this retrospective study, 703 children aged ≤ 18 years admitted to KK Women's and Children's Hospital with CAP in 2010 were included. Patients with co-morbidities not reflective of the general paediatric population were excluded. Demographics, clinical presentation, antibiotic(s) use, pathogen(s), complications and clinical outcomes were compared.

Results

	Uncomplicated CAP	Complicated CAP	*p* value
	n = 647 (92.0%)	n = 56 (8.0%)	
Age (Years)*	3.2 (0.04 - 16)	5.0 (0.12 - 15)	0.001
Childcare/School attendance†	340 (52.6)	41 (73.2)	0.004
Causative organism†	10 (1.5)	10 (17.9)	<0.001
Streptococcus pneumoniae	120 (18.6)	11 (19.6)	0.840
Mycoplasma pneumoniae			
CRP (mg/dL)†	66.9 (2.5 – 586.2)	210.0 (2.5 – 575.2)	<0.001
Further complications†	14 (2.2)	17 (30.4)	<0.001
(e.g.: empyema, lung abscess)			
Interventions done†	5 (0.8)	19 (33.9)	<0.001
(e.g.: chest-drain insertion, video-assisted thoracoscopic surgery, thoracotomy)			
Total hospitalization days*	3 (1 – 20)	6 (3 – 34)	<0.001
Total antibiotic days*	14 (0 – 45)	25 (10 – 47)	<0.001

*Legend: * median (range), † n (%)*

There was no CAP-related mortality.

Conclusions

Mycoplasma pneumoniae remains the most common cause of CAP in children. *Streptococcus pneumoniae* has emerged as a major pathogen in complicated CAP. Children with complicated pneumonia are older, with a more severe presentation in terms of inflammatory markers, need for surgical interventions and require a longer duration of hospitalization and antibiotics.

ESPID-0354

NEONATAL BLOOD STREAM INFECTION AT LEVEL III NEONATAL INTENSIVE CARE UNIT NEW DELHI: MICROBIOLOGICAL PROFILE AND ANTIMICROBIAL SUSCEPTIBILITY

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Introduction: Blood Stream Infection (BSI) contributes significantly to morbidity and mortality among newborns. Microbiological profile and their antimicrobial susceptibility are dynamic.

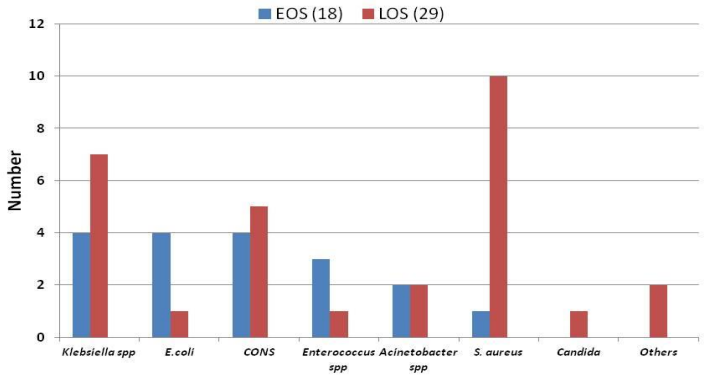
Objective: Was to investigate microorganisms causing blood stream infection and to assess their antimicrobial susceptibility.

Methods: Charts of newborns admitted in Neonatal Intensive Care Unit in the period between January 2012 and December 2012 were reviewed. Data on microorganisms grown, their relation with the time of onset of sepsis and their antimicrobial susceptibility were retrieved. Analysis was done with SPSS 20 and the frequency distribution tabulated.

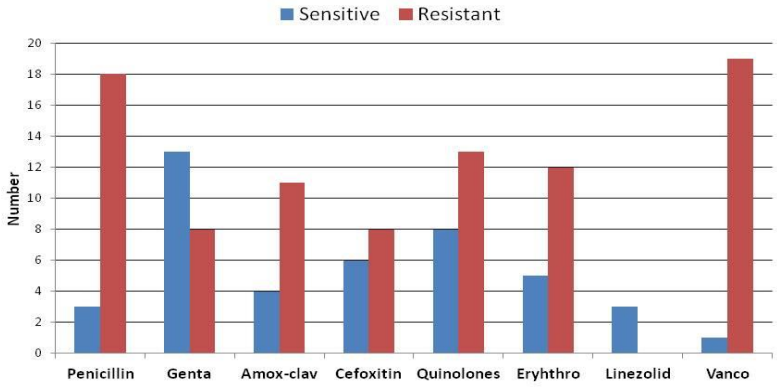
Results: Forty seven (18.9%) out of total of 248 blood cultures sent grew microorganisms. Eighteen babies had early onset sepsis (EOS) and 29 late onset sepsis (LOS). Common microorganisms responsible for EOS were *Klebsiella spp.*, *E.coli* and Coagulase negative *S.aureus* (*CONS)* whereas *S.aureus*, *CONS* and *Klebsiella spp*. were responsible for LOS. Among gram positive bacteria resistance to penicillins, gentamycin, amoxycillin-clavulinic, quinolones and erythromycin was very high. Three out of 9, *S. aureus* isolates were MRSA. Most of the Gram negative organisms were resistant to gentamycin, amikacin, third generation cephalosporins, and quinolones. Carbapenem resistance was seen in 65% of the gram negative organisms. There was moderate to good susceptibility to piperacillin-tazobactum, colistin, and tigecycline.

Conclusions: *Klebsiella spp*. was the commonest microorganism causing BSI. High incidence of resistance to commonly used antimicrobials was observed.

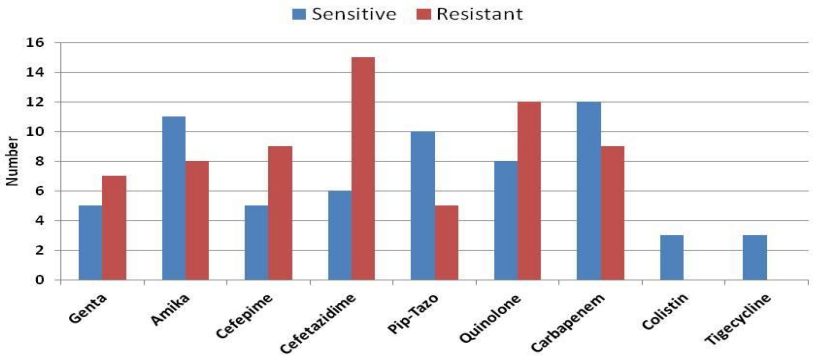
Microorganisms in relation to time of onset of Sepsis



Gram Positive: Antimicrobial Resistance



Gram Negative: Antimicrobial Resistance



ESPID-0355

PREDICTOR OF MORTALITY IN NEWBORNS WITH BLOOD STREAM INFECTION IN LEVEL III NEONATAL INTENSIVE CARE UNIT NEW DELHI

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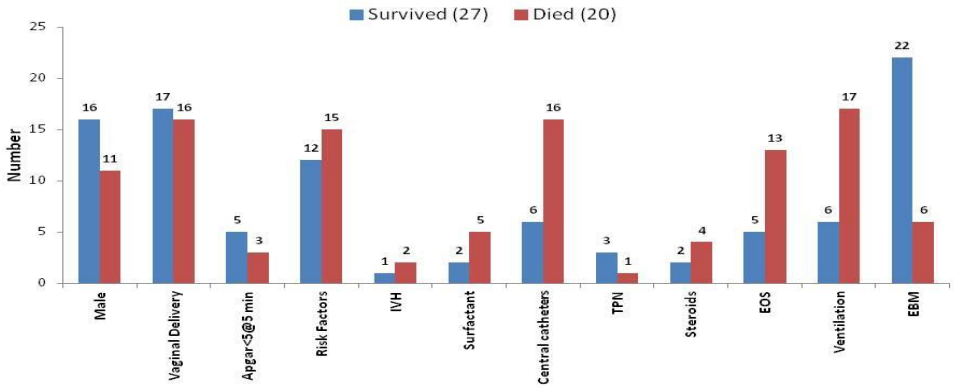
Introduction: Blood Stream Infection (BSI) contributes significantly to morbidity and mortality among newborns.
Objective: Was to identify predictors of mortality in babies with BSI.
Methods: Medical records of newborns admitted in Neonatal Intensive Care Unit in the period between January 2012 and December 2012 were reviewed. Data on patient demographics, underlying diseases, medications, central catheters, nutrition, ventilator use etc. was retrieved. BSI was defined as positive culture from blood specimens. The outcomes of the patient were defined as survived, or died. Risk factors were evaluated using Univariate and Multivariate Logistic Regression Analysis.
Results: Forty seven (18.9%) out of total of 248 blood cultures sent grew organisms. Twenty babies (42.5%) who had BSI died. Male gender, non vaginal delivery, asphyxia, surfactant administration, total parenteral nutrition, steroids or ventilation duration, did not significantly influence mortality. On Univariate analysis factors associated with significantly high mortality were low birth weight, prematurity, maternal risk factors for sepsis, central catheters, early onset sepsis (EOS), ventilation and not able to give breast milk. Multivariate logistic regression analysis revealed that EOS (O.R. 33.34, C.I. 1.31-851.85 $p<0.05$) and Ventilation (O.R. 57.72, C.I. 2.75-1211.05 $p< 0.01$) were independent risk factors for mortality. Breast Milk (O.R. 0.03 C.I. 0.01-0.95.1 $p< 0.05$) was protective.

Conclusions: Ventilation and EOS are important contributors to mortality in BSI. Breast milk has protective effect.

Factors Affecting Mortality



Univariate Analysis

Variable	Survived (n=27)	Died (n=20)	O.R.	Confidence interval		p value
Male	16	11	1.19	0.37	3.83	0.77
Vaginal Delivery	17	16	0.43	0.11	1.63	0.21
IVH	1	2	2.89	0.24	34.31	0.40
Duration of Stay (Days)	27.93±16.5	12.45±15.4	0.93	0.88	0.98	0.005
Gestation (Weeks)	34.2±3.7	31.2±3.7	0.81	0.68	0.96	0.016
Birth weight (gm)	1796±698	1178±579	0.99	0.99	1.00	0.007
Risk Factors	12	15	3.75	1.06	13.29	0.041
APGAR <5 at 5 min	5	3	0.78	0.16	3.71	0.78
Surfactant	2	5	4.17	0.72	24.23	0.112
Central catheters	4	16	23.99	5.01	105.7	0.000
EOS	5	13	8.17	2.15	31.11	0.002
TPN	3	1	0.42	0.04	4.38	0.47
Steroids	2	4	3.13	0.51	19.09	0.217
Ventilation	6	17	19.83	4.31	91.26	0.000
Ventilation duration	2.85±9.6	2.60±2.3	0.99	0.92	1.08	0.91
Breast Milk	22	6	0.097	0.03	0.38	0.01

Multivariate Logistic Regression Analysis

Factors	Odds Ratio	Confidence Interval		P Value
Early Onset Sepsis	33.34	1.31	851.85	0.034
Ventilation	57.72	2.75	1211.05	0.009
Breast Milk	0.03	0.01	0.95	0.047

Multivariate logistic analysis revealed that Early Onset Sepsis (O.R. 33.34, C.I. 1.31-851.85 $p<0.05$) and Ventilation (O.R. 57.72, C.I. 2.75-1211.05 $p< 0.01$) were independent risk factors for mortality. Breast Milk (O.R. 0.03 C.I. 0.01-0.95 $p< 0.05$) was protective.

ESPID-0357

ACTIVE IMMUNIZATION IN PRESCHOOL CHILDREN IN BITOLA IN THE PERIOD OF 2008 TO 2012

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ACTIVE IMMUNIZATION IN PRESCHOOL CHILDREN IN BITOLA IN THE PERIOD OF 2008 TO 2012

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Introduction: Active immunization in our country is compulsory against tuberculosis, diphtheria, tetanus, pertuses, poliomyelitis, measles, parotitis, rubeola, hepatitis B and hemophylus influenza tip B.

Aims: The aim of the study is to evaluate the comprising of preschool children till 5 years with vaccination in Municipality of Bitola and to determine the success of vaccination.

Materials and methods: In retrospective epidemiological study the vaccination data were analyzed in the period of 2008 to 2012.

Results: With HB vacine were comprised 98,24-99,46% of children. With primovaccine DTP (three doses) were comprised from 91,11 to 99,44% of children, with first revacination the comprising was 98,53 to 99,44%, and with second revaccine 93,34-98,66%. With primovaccine OPV were comprised from 91,11 to 99,44%, and with revactination 98,53-99,44% of the children. Vaccine against Hepatitis B in Macedonia was introduced in september 2008 when with the primovacine were comprised from 91,53 to 98,00% and with revacine from 47,22-96,71% of children. With vaccine against MMR were vaccinated from 98,97-100% of children.

Conclusion: In Municipality of Bitola the percentage of performed immunization in preschool was over 90%with some variations during years. In order to achieve complete comprising of children with compulsory vaccination, very important is health education of parents.

Key words: active immunziation, preschool children, Macedonia

ESPID-0358

AETIOLOGY OF ARTHRITIS IN CHILDREN HOSPITALIZED IN A FRENCH PAEDIATRIC TERTIARY CARE HOSPITAL: A 2 YEARS OBSERVATIONAL STUDY

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Background and aims. In children, the causes of arthritis are varied, including septic and viral arthritis, reactive arthritis and juvenile idiopathic arthritis (JIA). We aimed to describe the different types of arthritis among children hospitalized for first episode of arthritis.

Methods. Children younger than 16 years old hospitalized for first episode of arthritis between January 1, 2008 and December 31, 2009 in a French tertiary care centre (Robert Debré hospital, Paris, France) were retrospectively analyzed. Demographic characteristics, clinical features and duration of hospital stay were compared, using $\chi 2$ or Fisher exact test and non parametric tests.

Results.173 children have been hospitalized for a first episode of arthritis between 2008 and 2009, with a sex-ratio (M/F) of 1.14. The first cause was septic arthritis (43.4% of cases, including 69.3% due to *Kingella kingae and 10.7 % due to Staphylococcus aureus).* JIA represented 8.1% of cases and arthritis without any definitive diagnosis 40.4% of cases. Median age at diagnostic was 2.7 years (IQR=1.3-6.1) and was lower in the group with septic arthritis (1.5 years [1.1-3.4]) than with JIA (4.7 [2.5-10.9]); $p<0.001$. Septic arthritis involved a single joint in 97.3% of cases, JIA involved 4 joints in 14.3% and between 2 and 4 joints in 28.6% of cases, $p<0.001$.

Conclusions. Septic arthritis is the most frequent cause of arthritis in children needing hospitalization. Despite implemented of molecular methods with use of polymerase chain reaction (PCR) for *Kingella kingae* in synovial fluid, improvement of the diagnosis of arthritis without any definitive diagnosis is needed.

ESPID-0359

USAGE OF PROBIOTICS FOR THE TREATMENT OF CHILDREN'S DIARRHEA

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The aim. Improving of etiopathogenic treatment of patients with acute intestinal infectious diseases accompanied with diarrhea syndrome with the help of probiotic on the basis of living lyophilized bacteria L. rhamnosus Rosell-11 and L. acidophilus Rosell-52.

Methods and materials. There were monitored 130 children aged from 3 months to 15 years in Region Infectious Clinical Hospital during 2011-2013. Among the monitored group there were 37 children having the diagnosis of food poisoning (gastroenteritis form), 38 children having the diagnosis of salmonellosis, 55 - rotavirus gastroenteritis and enterocolitis. All patients got standard therapy, and the mentioned above probiotic was prescribed additionally to 77 children during 10-14 days.

Results. The data obtained indicate significantly shorter duration of fever, diarrhea, abdominal pain and tenderness to palpation along the intestine ($p < 0,05$), lethargy and anorexia ($p < 0,01$) among patients, suffering from rotavirus, having probiotic as additional therapy in comparison with control group. Prescription of the probiotic to patients having gastrointestinal form of salmonellosis was accompanied with significantly shorter duration of fever ($p < 0,01$), abdominal pain and tenderness on palpation, lethargy and anorexia ($p < 0,05$) in comparison with children from the control group. The duration of diarrhea was also shorter when probiotic was prescribed but without significant differences in comparison with control group.

Conclusions. The probiotic on the basis of L. rhamnosus and L. acidophilus has a high clinical efficiency for curing patients that have moderate course of acute intestinal infections accompanied with diarrhea syndrome.

ESPID-0361

VIRAL ETIOLOGY OF RESPIRATORY INFECTIONS IN CHILDREN IN NAJRAN, SAUDI ARABIA, USING THE MULTIPLEX RT-PCR

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Background: Acute respiratory tract infections (ARTI's) are a leading cause of morbidity and mortality among children under 5 years of age. Viruses are the major cause. Our aims were to investigate 15 respiratory viruses in children with ARTI's using multiplex RT-PCR and to analyze the clinical and the epidemiological features.

Method: 135 children ≤ 5 years of age, who presented with ARTI's between October 2012 and July 2013, were included. The clinical, socio-demographic data and the laboratory results were recorded using a standardized questionnaire. Two nasopharyngeal swaps were collected from each child; one for bacteriological examination and the second for viral detection using multiplex RT- PCR.

Results: A single virus was detected in 76 (56.3%); viral co-infections in 9 (6.7%); and mixed virus and bacteria in 15 (11.1%) patients. The respiratory syncytial virus; (RSV) in 33 patients; (30.3%), human rhinoviruses; (hRV) in 22; (20.2%), adenoviruses; (AdV) in 19; (17.4%), human metapneumovirus; (hMPV) in 13; (11.9%), influenza viruses; (IFV) in 10; (9.2%), parainfluenzae viruses; (PIV's) in 7; (6.4%), human corona viruses; (hCoV) in 4; (3.7%) and human bocavirus; (hBoV) in 1patient; (0.9%).

Conclusion: the RSV, hRV and AdV were the most frequent viruses, accounting for more than two-thirds of the cases, but other viruses, hMPV, hCoV NL63 and hCoV OC43 may play a role in pediatric ARTI's. Use of multiplex RT-PCR can provide epidemiological and virological data and importantly detect the emergence of novel respiratory virus ahead of time especially in the era MERS-CoV.

Key words: molecular diagnosis, antibiotics, fifteen viruses

ESPID-0362

EPIDEMIOLOGY OF COMMUNITY-ACQUIRED (CA) VIRAL LOWER RESPIRATORY TRACT INFECTION IN HOSPITALIZED CHILDREN

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Aims:
Classification, description and monthly distribution of viral etiologies of different types of CA lower respiratory tract infection (LRTI) in hospitalized children.

Evaluation of the influence of age on the clinical presentation and frequency of viruses. Description of the seasonal distribution of the different viruses causing CA LRTI.

Methods:
Retrospective study of children hospitalized for CA viral LRTI in Brussels from September 2007- December 2011.

Use of strict definitions of different types of LRTI.

Results:

The most frequent diagnosis of CA viral LRTI was the bronchiolitis (65.5%). Among bronchiolitis, spastic bronchitis and tracheobronchitis, RSV was the most frequently viral agent isolated (27.7%). The most common laryngitis' etiologies were PIV (33.3%) and influenza (15.6%). Bronchiolitis has a peak frequency from November to January. Laryngitis was more frequent in August. Bronchiolitis represented 94.8% of CA viral LRTI in infants. RSV was the main virus associated with hospitalization for CA LRTI, especially among children under 3 years. RSV had a peak incidence from November to December. The frequency of influenza increased with age. Influenza was common from December to May. The frequency of RV, adenovirus and PIV didn't change with age. PIV was most frequently seen in spring and summer. Adenovirus and RV did not show a seasonal distribution.

Conclusions:

We confirm the leading role of RSV, RV, PIV, influenza and adenovirus in CA LRTI in hospitalized children. The most common clinical presentation was bronchiolitis. RSV remained the most frequent virus isolated in young children.

ESPID-0363

EVOLUTION OF COMMUNITY ACQUIRED (CA) VIRAL LOWER RESPIRATORY TRACT INFECTIONS DURING 4 YEARS IN HOSPITALIZED CHILDREN

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Background and aims:

Worlwide, viruses are the leading causes of viral lower respiratory infections (LRTI) in hospitalized children.
We assessed the severity of different viral infections and the change in the severity of RSV bronchiolitis over a period of 4 years in hospitalized children.

Methods
Retrospective study of children hospitalized for CA viral LRTI in Brussels from September 2007 to December 2011.
Description of the severity of different viruses causing CA LRTI.

Results

The most aggressive infectious agents were RSV and adenovirus.
RSV had a length of hospital stay significantly longer than other viruses. It was the agent more frequently treated by oxygen and for longer time. RSV was the main virus responsible for PICU admission. The use of ECMO only affected RSV patients. The duration of invasive ventilation (IV) was longer for RSV. Two of the 3 deaths in the study were RSV infections.

In adenovirus infections, CRP on admission was significantly higher than that of RSV and RV infections. Patients with Adenovirus had a leukocytosis on admission significantly higher than RSV, influenza and PIV subjects.

We showed a statistically significant increase in the duration of pyrexia, the use of IV, the antibiotic use, the length of stay in the PICU and the length of hospitalization of RSV bronchiolitis in recent years.

Conclusions

The severity of disease caused by RSV and Adenovirus was higher than that of other viruses. RSV bronchiolitis was more severe in recent years. These results might be secondary to the emergence of more virulent strains.

ESPID-0364

ENTEROVIRUS 71, A SPECTRUM OF PRESENTATION

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Introduction

Although death and disability from enterovirus 71 is described in Asia and the USA it is rare in Western Europe. We present the cases of twin siblings with contrasting outcomes to highlight the potentially devastating effect of this infection.

Case 1

A five week old twin presented with a short history of poor feeding and hypothermia. She developed focal seizures which resolved with treatment but later became apnoeic requiring intubation and ventilation. She was haemodynamically stable but showed limited respiratory effort off the ventilator. MRI brain revealed severe encephalitis and EEG was consistent with a severe encephalopathic process. Following discussion with her parents the focus of her care shifted to palliation and she died three days later after withdrawal of ventilator support. Throat swab and blood but not CSF, were positive for enterovirus 71 DNA by PCR.

Case 2

Her five week old twin sibling was admitted for observation. He also became hypothermic and developed focal seizures but did not require respiratory support. Throat swab and blood were positive for enterovirus 71. He was discharged well with no focal neurology and a normal MRI.

Conclusion

Enterovirus infections are commonly thought of as mild, self-limiting illnesses which resolve with no lasting effects. This report highlights the rarer, more serious effects of the infection and we recommend that clinicians should remain vigilant for signs of encephalitis when dealing with this common infection.

ESPID-0365

PROTECTION AGAINST MEASLES AND MUMPS IN HIV-INFECTED CHILDREN

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Background and aims. HIV-infected children are at increased risk of infectious diseases caused by vaccine preventable pathogens. Protection especially against measles is important in this high-risk population because of high prevalence of measles in Ukraine.

Methods. A total of 66 perinatally HIV-infected children receiving medical care in Kiev City AIDS Center who had received vaccination against measles and mumps were enrolled. HIV clinical stage, lymphocyte subsets, measles and mumps antibody were determined.

Results. The median age at time of study was 8,6 years (range 6 to 14 years). 56 out of 66 children were on HAART. Most of children on HAART had undetectable viral load (87,9%) and CD4+ >25% (86,4%). Overall 38 (57,6%) children had detectable measles antibody and 20 (39,4%) – mumps antibody. The proportion of children with detectable measles antibody was higher among children vaccinated after 24 months of age (79,2% vs 53%, $p<0.01$). The children starting vaccination against measles and mumps on HAART have a significantly better response against these infections ($p<0,01$). The presence of measles and mumps antibody correlated with shorter interval from last MMR to study entry. Only 35,7% children with lacked antibody to measles were optimally immunized, up-to-date immunization received 57,9% children with detectable antibody.

Conclusion. Higher proportion of HIV-infected children given vaccine on HAART developed protective immunity to measles and mumps. It is important to identify missing immunizations in HIV-infected children. Vaccination policies should be developed for HIV-infected children on HAART who lack the protective immunity against measles and mumps after up-to-date immunization

ESPID-0366

PNEUMOCOCCI ISOLATED AMONG HOSPITALIZED CHILDREN WITH LOBAR PNEUMONIA IN THE PCV-7 ERA. BRUSSELS, BELGIUM

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Background: Lobar pneumonia is responsible for a large number of pediatric hospitalizations and may originate serious complications. The most common etiological agent is *Streptococcus pneumoniae*.

A pneumococcal conjugate vaccine (PCV-7) was introduced in 2007 in the Belgian childhood vaccination schedule to prevent the infections caused by the 7 most common pediatric serotypes of *S. pneumoniae* at that time.

Aim: To study the epidemiological evolution of pneumococci identified in children hospitalized in Brussels with community-acquired lobar pneumonia in the years following the generalization of PCV-7 vaccination.

Methods: Retrospective study among children aged less than 15 years hospitalized with community-acquired lobar pneumonia in HUDERF's general pediatrics departments and PICU. The period covered goes from 1.9.2007 to 31.8.2011, when PCV-13 was introduced in Belgium.

Results: 533 cases of lobar pneumonia were recorded. The presence of *S. pneumoniae* was proven in 13.1% of cases. None of the *S. pneumoniae* identified belonged to one of the serotypes included in PCV-7, while 88.9% belonged to a serotype included in PCV-13. Serotype 1 accounted for 48.1% of identified serotypes.

23.4% of the patients developed a pleural effusion, with no significant difference over time.

Conclusions: A change in the most common pneumococcal serotypes identified in children hospitalized for lobar pneumonia has occurred in the years following PCV-7's introduction.

The increased frequency of pleural effusions recorded by others was not observed in the present study.

The serotypes identified in this series show that PCV-13 should adequately prevent most cases of lobar pneumonia in Belgian children.

ESPID-0367

ANTIBIOTIC SUSCEPTIBILITY OF THE MOST FREQUENT ISOLATES OBTAINED FROM PATIENTS WITH CYSTIC FIBROSIS

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INTRODUCTION AND OBJECTIVES. Cystic fibrosis is the most common inherited genetic disease in the Caucasian population. Chronic infection of the lungs is characteristic of cystic fibrosis and requires antibiotic therapy. In terms of the global increase in antibiotic resistance, it is important to monitor and know the rate of antibiotic susceptibility of the most common isolates in patients with cystic fibrosis.

AIM.In this study, strains from sputum and deep pharyngeal swabs of patients with cystic fibrosis were identified and their antibiotic susceptibility was analyzed.

METHOD. In Montenegro there are 22 registered patients with cystic fibrosis. From January 2012 to December 2013 a sixty six isolates (45 from deep throat swabs and 21 from sputum) belonging to 15 patients aged from 1 to 18 years were examined.

RESULTS. The most common isolates were *Staphylococcus aureus*, *Pseudomonas aeruginosa* and *Serratia mercescens* (28, 16 and 15, respectively). All isolated strains of *Pseudomonas aeruginosa* were sensitive to pipercillin/tazobactam and ciprofloxacin. High resistance rate to ceftriaxone, gentamicin, amikacin and trimethoprim/sulfamethoxasole were determined in *Serratia mercescens* strains (100%, 93%, 100%, 93%, respectively). Ciprofloxacin was found the most effective antibiotic to *Serratia mercescens*. No resistance to methicillin was observed in *Staphylococcus aureus*.

CONCLUSION. According to the results, although ciprofloxacin shows good efficacy, the treatment of lung infections caused by Gram "-" bacteria in patients with cystic fibrosis remains a major challenge.

ESPID-0368

THE FIRST FRENCH CASES OF SEVERE MALARIA IN CHILDREN TREATED WITH ARTESUNATE

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Background

Since 2007,the World Health Organisation recommends parenteral artesunate as first-line therapy to treat severe *plasmodium falciparum* malaria in children. The results of AQUAMAT trial points out its efficacy with a reduction of mortality in african children with severe malaria. Parenteral artesunate is available in France since 2011 to treat severe imported malaria but few data are available on its efficacy and safety.

Aim

Describe efficacy and safety of parenteral artesunate as first-line therapy of severe imported malaria in children (18 months < age < 15 years).

Methods

We performed a retrospective study of all children with severe imported malaria treated with parenteral artesunate admitted in pediatric intensive care unit at Robert Debré University Hospital (Paris).

Results:

Six children were treated from September 2012 to December 2013 for severe *plasmodium falciparum* malaria. The median number of severity criteria in each child was 3.5 [2 to 4] including 4 cases of cerebral malaria. The median parasitemia at diagnosis was 4.7 % [0.5 to 10]. The median number of artesunate infusion was 5 [3 to 7]. No deaths were observed and parasitemia control on day 3 was negative in all 6 patients. Asymptomatic QTc prolongation was observed in one patient but it disappeared when the treatment was discontinued. No cases of hypoglycemia or delayed hemolytic anemia have been observed.

Conclusions

Parenteral artesunate should replace quinine as first-line therapy for severe imported *plasmodium falciparum* malaria in children. Data on safety must be monitored with a prolonged follow-up.

ESPID-0369

EPIDEMIOLOGY OF COMMUNITY-ACQUIRED PEDIATRIC PNEUMONIA AND IMPORTANCE OF EARLY MICROBIOLOGICAL DIAGNOSIS

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Background and aims: Clinical, biological and radiographic presentation (CBR) cannot predict reliably the causative microbiological agent involved in community-acquired pediatric pneumonia (CAPP) to choose appropriate initial treatment. The aim of our study was to describe the epidemiology of CAPP by systematic microbiological investigations.

Methods: Studied population: <15 year-old children attending pediatrics' emergency for clinical pneumonia which was confirmed by chest-X-ray. Microbiological investigations: 1/sputum culture for common cultivable bacteria, 2/nasal secretions: PCR for *Mycoplasma pneumoniae, Chlamydophila pneumoniae*, *Bordetella pertussis/parapertussis* and immunofluorescence staining for respiratory viruses, 3/blood cultures, 4/urine *Streptococcus pneumoniae antigen* detection. Comparison between CBR according to viral or bacterial pneumonia was done by Chi-2, Fisher and Kruskal-Wallis tests.

Results: From December 2012 to May 2013, 92 children (mean age 4.3 years) were included. Pathogens were identified in 68 (74%) cases, including 42 bacteria, 10 viruses and 16 co-infections. *Streptococcus pneumoniae* (n=33) and *Haemophilus influenzae* (n=16) were the most common etiological agents before *RSV* (n=13), *Metapneumovirus* (n=7), *Mycoplasma pneumoniae* (n=3), *Chlamydophila pneumoniae* (n=2), *Influenza virus* (n=2), *Adenovirus* (n=1). CBR couldn't distinguish bacterial from viral infections. 98% of children have received at their admission an antibiotic but inappropriate to the identified pathogen for half of them, including 10 viral pneumonia. Early identification of the causative agent should allow saving 4.5 days of antibiotics per child.

Conclusions: with systematic lab tests, microbiological agent in CAPP can be identified in ¾ of cases allowing appropriate and cost effective treatment. Multiplexe assays for both bacterial and viral respiratory pathogens should improve lab performance in CAPP.

ESPID-0370

HUMAN PARECHOVIRUS TYPE 3 (HPEV3) INFECTION AS A CAUSE OF APNEA IN PREMATURE INFANTS

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Human Parechoviruses (HPeVs) are newly recognized viruses belonging to a family of Picornaviridae. Among them, HPeV type 3 (HPeV3) has been known as a pathogen of sepsis-like syndrome, central nervous system infections, and sudden infant death syndrome in neonates and early infants. We recently experienced five infants with apneic episodes caused by HPeV3 infection and two of the cases were diagnosed by real-time PCR. Four of five (80%) cases were preterm infants (median GA 30.5 weeks, range 27-34 weeks) and all cases required oxygen supplementation for oxygen desaturation. One patient was in acute respiratory failure and required mechanical ventilation. All cases survived without any sequelae. Although respiratory-syncytial virus infection and pertussis are known to be the common causes for apnea in neonates and infants, HPeV3 infection should be included in the differential diagnosis of apneic infants, especially in those with prematurity.

ESPID-0371

CHANGES IN BEHAVIOUR OF INFLUENZA A(H1N1)PDM09 INFECTION FROM PANDEMIC TO FIRST POSTPANDEMIC SEASON

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Background: We studied incidence, clinical and epidemiologic characteristics, and risk factors for a severe clinical outcome in hospitalized children with laboratory-confirmed influenza A(H1N1)pdm09 infection in the pandemic (PAN) and first postpandemic season (POST).

Methods: Prospective study from May 2009-April 2011 in paediatric wards at Donostia University Hospital (assisted population:54119children< 14 years). All cases of hospitalized children< 14 years with influenza viral infection, confirmed microbiologically, were collected. Severe disease was defined as either admission to the intensive care unit (ICU) or-in-hospital death.

Results: We identified 73 patients in 2009-10 and 113 in 2010-11. The hospitalization rate (HR) was higher in POST (15,9 and 3,4/10.000 inhabitants< 5 years); (29,4 and 4,9/10.000 inhabitants< 6 months). The mean-age of the PAN was higher (6,9/ 2,7 years;p<0.0001) being sex distribution balanced. The percentage of underlying medical conditions was the same in both periods: asthma (21,9%/18.6%)(p=0.6);malignancy(8,2%/4,4%;p=0.3);neurological pathology (5,5%/7,1%)(p=0.6); except from heart disease, higher in PAN (13,7%/2,7%)(p<0.004). The proportion of severely diseased patients decreased from 9,6% in 2009-10 to 1,8% in 2010-11 and the mean-stay in ICU was shorter(7.0/5.0 days) *,requiring less ventilatory support (5,5%/0%)(p=0.045*). No differences were observed regarding to the need for oxigenotherapy. There were no deaths.

Conclusion: The majority of children admitted in POST had uncomplicated illness despite the higher HR, probably motivated by social alarm. In the PAN season the majority of cases were in adolescents, the mean-age was higher and we found a lower percentage of children< 6 months. In the subsequent season, this pattern shifted to younger children.

ESPID-0372

TRANSIENT POST-VIRAL CYTOPENIA IN CHILDREN: EXPERIENCE OF A TETRIARY CARE CENTER

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BACKGROUND: Acquired cytopenia in previously healthy children is common and usually appears during a (most commonly viral) infection.

AIM: To assess the frequency of febrile cytopenia in childhood, estimate its duration, course and outcome.
MATERIAL–METHODS: 117 febrile children aged 4.0±3.8 years (range 0-14), who were admitted to a paediatric ward during a 2-year period with febrile cytopenia, were investigated.

RESULTS: In 52/117 (44.4%) cases a viral agent was identified. The detected viruses were as follows: CMV,RSV, EBV, influenza A, influenza B, parainfluenza, rubella, mumps, HSV, HHV6, adenovirus, Coxsackie, Echo, parvovirus B19 ,varicella zoster virus.

Among them, 32/52 had neutropenia/leucopenia, while 11/52 had thrombocytopenia. The most frequently detected virus in neutropenic children was influenza B (8.5%), followed by mumps virus (6.4%). In children with thrombocytopenia, EBV was most frequently detected (10.2%), followed by HSV (6.1%). In cases with 2-3 cell lines involved, influenza viruses type A and B were more frequently detected.

Single cell line cytopenia was predominantely present in most cases (43/52) (82.7%), while in 9/52 (17.3%) cases 2-3 cell lines were involved. Post-viral cytopenia was transient with a mean(± SD) duration of 38.4(± 60.4) days, (range 3-100d). Only in one patient with CMV IgM (+), cytopenia lasted for >120 days. Transient post-viral cytopenia was of mild to moderate severity without clinical impact.

CONCLUSIONS: Viral disease may affect one or more cell lines. It is usually transient, without serious complications and resolves spontaneously. In cases of severe, long-lasting cytopenia affecting more than one cell lines, further investigation is required.

ESPID-0374

SEROEPIDEMIOLOGIC STUDY OF VARICELLA ZOSTER VIRUS IN KOREAN ADOLESCENTS AND ADULTS USING ELISA & FAMA ASSAY

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INTRODUCTION: Varicella zoster virus is a highly contagious, and causes chickenpox and herpes zoster. In Korea, chickenpox is still developed in adolescents, and herpes zoster occurs mainly in the elderly persons. Therefore, it is important to know the immune status against varicella-zoster virus(VZV) in Korean adolescents and adults to control the VZV disease.

OBJECTIVES: The objective is to confirm the age specific seroprevalence of VZV, and to compare the GMT levels between age groups.

AIM: The aim of this study was to survey the immune status of healthy Korean adolescents and adults over 10 years of age against VZV.

METHODS: Anti-VZV IgG antibodies were measured by a commercial ELISA kit. FAMA test was performed to measure the seropositive rate. We used MRC 5 cells as host cell and Mogam strain as FAMA antigen in FAMA assay.

RESULTS: 390 adolescents and 799 adults were enrolled in this study. The ELISA GMT was 816. mIU/ml, but the GMT level of teenage group was significantly lower than the level of old aged group over 40 years old. Also, 89.7 % of the adolescents and 95.9% of the adults had a protective level of antibody titer against varicella. The FAMA seropositive rate was 99.4%.

CONCLUSION: Most Korean adolescents and adults have a protective level of anti-VZV antibody against varicella. But, catch-up VZV vaccination is still needed in the adolescents. The GMT of anti-VZV antibodies was significantly increased with age. And FAMA assay was more sensitive than ELISA assay.

ESPID-0375

CANDIDAEMIA IN CHILDREN: AN 11 YEAR FEAST OF YEAST

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CANDIDAEMIA IN CHILDREN: AN 11 YEAR FEAST OF YEAST

Introduction : *Candida* spp. are the most common cause of systemic fungal infections in children and a significant cause of morbidity and mortality. We describe our experience with candidaemia in a tertiary paediatric referral centre in Australia.

Methods: We retrospectively analysed the case notes of all patients who had an episode of candidaemia over an 11-year period (2002-2013).

Results: 104 episodes of candidaemia were identified including 107 *Candida* spp. isolates. The majority (90.4%) occurred outside the neonatal period. The most frequent species were *C. albicans* (50.5%), *C. parapsilosis* (27.1%) and *C. glabrata* (6.5%). Underlying diagnoses included haematological malignancy, chronic gastrointestinal disease, congenital heart disease and chronic lung disease. Over half (59.6%) of the patients had been colonised with *Candida* spp. at another site in the 6 months prior to their episode of candidaemia; in three-quarters (75.8%) of these episodes, the species was the same as that isolated from blood culture. Less than three-quarters of all patients had ophthalmological review or abdominal imaging to screen for disseminated candidiasis. Of these, 5.3% had ocular involvement and 6.6% renal involvement. Median treatment duration was 18 (range 1-210) days. Treatment regimens varied considerably. Of the 90.1% of patients with central lines *in-situ*, two-thirds were removed.

Conclusions: Our study highlights the need for improved practice in relation to the investigation and treatment of candidaemia. Review of previous colonising candida isolates may be useful in guiding empiric therapy.

ESPID-0376

PHYLOGENETIC ANALYSIS OF INFLUENZA VIRUSES CIRCULATING IN SÃO PAULO STATE, BRAZIL: INFLUENZA SEASON 2013

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Introduction : Phylogenetics has been considered a powerful tool towards to monitor molecular evolution of influenza viruses worldwide. The aim of the present study is to share the molecular analysis of influenza viruses identified in São Paulo state, Brazil during influenza season 2013, in the context of global influenza virus surveillance and public health.

Material and Methods : Influenza viruses isolated in the Respiratory Virus Laboratory NIC/WHO Institute Adolfo Lutz, São Paulo, Brazil were submitted to sequencing assay and an aliquot of them were shared with CDC influenza team for phylogenetics and drug resistance analysis.

Results: Influenza A(H1N1)pdm09 isolated viruses pertain to the largest group, group 6 circulating worldwide. Subgroup 6 can be divided into three subgroups: 6A, 6B and 6C. During influenza season 2013 the influenza A(H1N1)pdm09 subgroup 6B, Influenza viruses H3N2 strain subgroup 3C; and Influenza B/Victoria lineage genetic group 1A has been identified in São Paulo state, Brazil.

Conclusion: Despite the genetic diversity, the vast majority of H1N1pdm09 are antigenically indistinguishable and similar to A/California/07/2009 which has been included in influenza vaccine since 2009. Influenza A/Victoria/361/2011 and A/Texas/50/2012 H3N2 H3N2 strains were identified in São Paulo state and also has been the vaccine component for influenza virus season for the northern and southern hemisphere. Influenza viruses B genetic group 1A has not presented HA amino acid changes when compared to B/Brisbane/60/2008. All influenza viruses isolated in São Paulo state of Brazil were sensitive to oseltamivir and zanamivir; and show the evolutionary pattern observed worldwide.

ESPID-0377

EPIDEMIOLOGICAL AND CLINICAL DIFFERENCES BETWEEN 2009 H1N1 PANDEMIC AND SEASONAL INFLUENZA EPIDEMICS BEYOND THE PANDEMIC

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Abstract

Background and aims: There have been few data regarding epidemiological and clinical differences across influenza epidemics beyond the 2009 H1N1 pandemic. We evaluated the characteristics of seasonal influenza epidemics in 2012 and 2013, and compared to 2009 pandemic.

Methods: The diagnosis of influenza was made by PT-PCR in 2009 pandemic and the rapid diagnosis kit in seasonal epidemics. The epidemiologic characteristics of the outpatients infected with influenza B virus in 2012 (202 patients) and those with the influenza A in 2013 (135 patients), and the clinical characteristics of the inpatients (54 patients and 44 patients, respectively) were analyzed and were compared with those in 2009 H1N1 pandemic (2,971 outpatients and 217 inpatients).

Results: The mean age of the patients in 2009 H1N1 pandemic was higher than seasonal epidemics. Age distribution in influenza B was relatively even with peak at 4-6 y, similar to the 2009 H1N1 pandemic, whereas in influenza A the majority of infected patients (76%) were < 5 y of age. The patterns of epidemic were similar in seasonal influenza B and 2009 H1N1 pandemic. In clinical characteristics, the patients with influenza B had longer fever duration and the higher pneumonia rate was seen in 2009 pandemic. There were no differences in laboratory findings including leukocytes with differentials.

Conclusions: The patients in 2009 pandemic were older and had higher frequencies of pneumonia, compared to those in seasonal influenza epidemics. The pattern of influenza epidemics suggests that herd immunity against different strains may affect on influenza epidemiology.

ESPID-0378

VIRAL GASTROENTERITIS ASSOCIATED DIARRHAE USE OF PROBIOTIC IN CHILDREN

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Introduction: Probiotics were demonstrated to have beneficial clinical effects on acute infectious diarrhea by reducing the duration and frequency of diarrhea.

Objective: To investigate the effect of using probiotics in the treatment of viral gastroenteritis associated diarrhea in children.

Methods: 164 children, 0-18 years of age admitted to our department due to the community-acquired, acute viral gastroenteritis were invited to participate in the study project. The duration of diarrhea was used probiyotic(Bifidobacterium bifidus and Saccharomyces boulardii) patients were evulated in our study for episodes and period diarrhea.

Results: Rotavirus was identified in 18.2% of patients, adenovirus and norovirus were identifed in 10.3% and 8.7% respectively. Episodes of diarrhea were observed 44 patients(34.9%) 1-3 episodes/day, 35 patients(27.8%) 4-5 episodes/day and 47 patients(37.3%) >5 episodes/day. Duration of diarrhea were had 110 patients(87.3%) 1-4 days, 4 patients(3.2%) 5 days. We were evaluated use drugs acute gastroenteritis treathment, this findings, 18 patients(14.3%) were used antibiyotic, 7 patients(5.6%) were used intestinal antiseptic and 24 patients(19%) were used probiyotic. Twenty four patients were used probiyotic while these cases, 3 patients(12.5%) 1-3 episodes/day, 10 patients(41.7%) 4-5 episodes/ day and 11 patients(45.8%) >5 episodes/ day. Also the patients were had period diarrhea, eighteen patients(75%) 1 day and six patients(25%) >5 days. Between used probiyotic with patients and without patients weren't signifant correlation for episodes and period diarrhea.

Conclusions: In this study, use of probiyotic detected 24 patients(19%) of diarrhea with children and the patients decreased duration of diarrhea while there was no difference episodes daily of diarrhea.

ESPID-0381

COMPARATIVE INHIBITORY EFFECT OF CAMIELLA SINENSIS (GREEN TEA) AQUEOUS NON-FERMENTED, FERMENTED AND SEMI FERMENTED EXTRACTS AGAINST H. PYLORI TESTED ON PREGNANT WOMEN IN KARACHI

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Background and objectives: *Helicobacter pylori,* which was first discovered in 1982, was found to be an important factor in the pathogenesis of peptic ulcer disease, gastritis, and gastric malignancy. The growing problem of antibiotic resistance by the organism in Pakistan thus demands the search for novel compounds, especially from natural sources as in this study; we screened the aqueous extracts of *Camiella sinensis* and also compared the anti bacterial efficacy of its non-fermented, semi - fermented and fermented products.

Material and Methods: In this study, a total of 400 biopsies were collected from the patients of gastro-duodenal pathology who were referred for endoscopy in a public sector hospital in Karachi, Pakistan. All these biopsies were processed for detection of *H.pylori* by two rapid Helicourease – indigenously developed rapid urease detection kits, culture and polymerase chain reaction (PCR).The 5% aqueous extract of fermented, semi fermented and non-fermented Green tea was prepared and their antibacterial potential was explored against 35 clinical isolates of *H. pylori* agar well diffusion technique. The Minimum Inhibitory Concentration (MIC) of the most susceptible tea products were also carried out by Micro-dilution method for the sake of comparison.

Results: A total of 120, clinical *H pylori* isolates were successfully cultured and identified by rapid and molecular methods. Most of the screened *H .pylori* isolates were resistant to more than one of the antibiotics like metronidazole and clarithromycin. *The most* significant activity was obtained in non-femented green tea with an average zone of inhibition along with MIC was around *32 mm (MIC 120-150 ?g/ml)*, semi fermented product showed *28 mm (MIC 140-200 ?g/ml) showed and fermented one showed 32 mm (MIC 120-200?g/ml)*.

Conclusion: In conclusion, our results indicated that all processed forms of green tea extracts possessed some variable level of anti *H. pylori* activity. But non fermented that is freshly plucked green tea leaves with out any industrial treatment have profound effect with least MIC and thus considered as a suitable and safe candidate for the eradication of *H.pylori* particularly drug resistant species.

ESPID-0383

AN AUDIT OF DENGUE FEVER CASES IN THE YEAR 2012-2013 AT CIVIL HOSPITAL KARACHI-PAKISTAN

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Background: Dengue virus is endemic in Pakistan, and occurs throughout the year, but with often with peaks in certain seasons. Dengue virus remains a major cause of morbidity and mortality; there is scarcity of data looking at the overall trend of dengue infection in Pakistan. Despite this, nearly 700 cases of confirmed dengue fever have been reported across Pakistan this year and many of the reported cases have been in Karachi; however dengue fever is also increasing in other parts of Sindh.
Methods: Patients suffering from high grade fever visiting Medical and Paediatrics outpatient departments as well as indoor patients of Civil Hospital, Karachi, Pakistan, in the year 2010 (from Jan.to Dec.) were included in this study. Patients were initially screened for platelet count and test for Dengue fever. Blood was collected aseptically and CBC (Platelet count) was done on Sysmex Haematology autoanalyser and test for Dengue antibodies IgM and IgG was done by Rapid Immunochromatography and ELISA technique. Dengue Antigen test was also done on some patients.
Results: Total 2321 patients were screened for Dengue fever, out of these 585 were reported positive for Dengue fever i-e 25.2%. 384 were males while 201 were females. Dengue Antibodies IgM and IgG (ICT) was done on 1118 samples, 585 were positive for IgM alone or both for IgM and IgG. i-e 26.39% Dengue Antibodies IgM and IgG (ELISA) was done on 260 samples 87 were positive for IgM (33%) and 28 were positive for IgG alone (10.77%). However, Dengue Antigen was done on 943 samples, 175 samples were reported positive for Dengue Antigen (18.5%).The result analysis indicated that the age group most affected was 20-40 years. Male /female ratio was found 2:1.Besides this,90% patients had low platelet count i-e less than 100,000/cumm, 10% had normal or near normal platelet count most of them showed decrease in platelet count later on.
Conclusion: In this current study, we concluded that from Jan 2011 to August 2011 the cases were sporadic but from September, there was sudden increase in the number of case which lasted till end of the year. According to the results, ICT is a reliable and rapid technique; the results are available in 15 minutes. ELISA technique though more reliable but time consuming. Due to the need for early diagnosis of Dengue fever Dengue Antigen test which is positive on the first day of fever, but the problem was that as soon as antibodies appear the antigen is cleared from the blood stream.

ESPID-0384

A CASE OF OSTEOARTHRITIS DUE TO NONTUBERCULOUS MYCOBACTERIA

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Introduction

A case of recurent swollen knee : osteo-arthritis due to nontuberculous mycobacteria (NTM).

Method

Previously healthy boy first admitted for osteoarthritis of the left knee after trauma with skin wound in the patella region. He was managed as a septic arthritis and treated with oxacilline and cefotaxime, switched orally by ciproxin (suspicion of Pseudomonas) and clindamycin for 3 months. Cultures remained negative.

One month after treatment discontinuation, he was readmitted in our service for recurrent swollen left knee. Echography revealed intra-articular effusion. Bone radiography and MRI showed an osteitis of the patella. Tuberculin intradermoreaction was negative.

Biology revealed slight inflammatory syndrome with normal leucocytosis. Articular fluid analysis showed 54400 white cells/mm3 (neutrophils 85%).

Bone biopsy revealed chronic osteomyelitis of the patella. PCR on bone fragment was positive for mycobacteria.

Since long-term culture remained sterile, we initiated a broad spectrum treatment with a combination of azithromycin, ethambutol and rifampicin.

Result

In case of osteoarthritis with negative culture, cultures and PCR aiming NTM should be made on joint fluid and bone biopsy. Even if PCR remains a rapid and sensitive way of diagnosis, culture plays an important role in the choice of antibiotic therapy.

In our case, NTM species could not be precised (prior ciproxin treatment). Since almost any NTM may cause osteoarticular infections, a broad spectrum treatment with combination of azithromycin, ethambutol and rifampicin must be considered, and continued for a minimum of 6 months.

Conclusion

Diagnosis of NTM osteoarthritis must be considered in case of culture negative infection following trauma.

ESPID-0385

TOXIN ANTITOXIN SYSTEM AS AN ANTIMICROBIAL TARGET FOR ANTIBIOTIC RESISTANT STAPHYLOCOCCUS AUREUS

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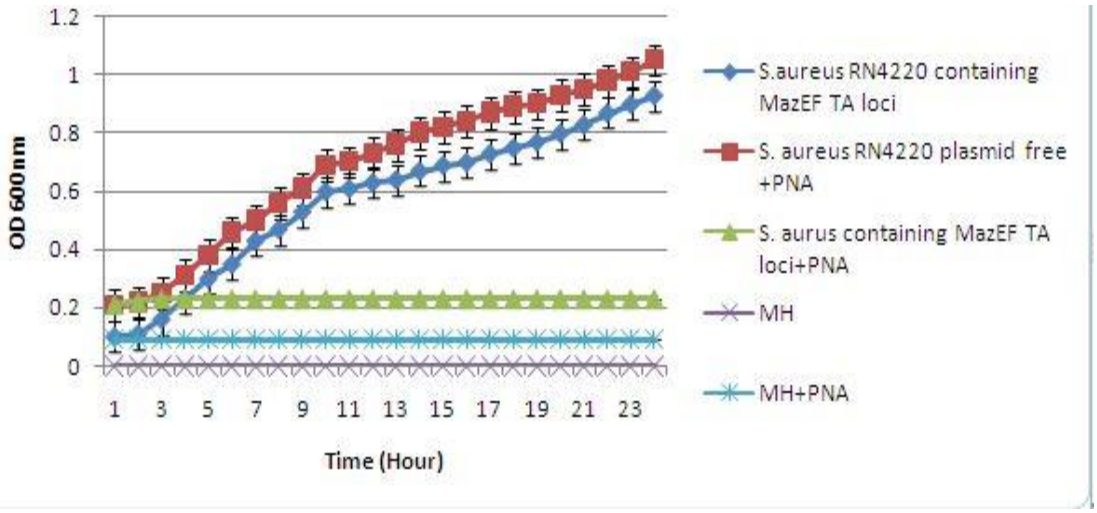
Abstract:

Introduction: Antibiotic resistant bacteria have become a worldwide concern. It therefore is necessary to find new strategies for prevention and eradication of pathogenic bacteria, especially the antibiotic resistant *S. aureus.* Toxin-antitoxin (TA) system could be a potent target for antibiotic therapy. The activation of toxin or inhibition of antitoxin would be an attractive target for antimicrobial therapy. **Objectives:** The current study was attempted to introduce new antimicrobial target for eradication of antibiotic resistant *S. aureus.* **Methods:** For this propose 1000 clinical isolates of *S. aureus* from Milad hospital (Iran) and 60 clinical isolates of MRSA from HKL (Malaysia) were evaluated. The most important step for potency of TA system, as an antibacterial target, is to identify a TA system that is prevalent in all resistant clinical strains and determine its functionality. **Results:** The results showed *MazEF* TA loci were prevalent in all antibiotic resistant *S. aureus* in Iran and MRSA strains in Malaysia that harbored on plasmid. RT-PCR, plasmid stability testing, RT-qPCR, ATPase and turbidity assays revealed *MazEF* TA loci is functional among all antibiotic resistant *S. aureus.* **Conclusion:** This study showed a unique target for eradication of antibiotic resistant *S. aureus*. An excellent advantage of *MazEF* TA system is its prevalence in all antibiotic resistant *S. aureus* and absence in antibiotic sensitive *S. aureus.* Peptide nucleotide acid (PNA) assay showed *MazE* (antitoxin) is potent target for eradication of antibiotic resistant *S. aureus.* The results showed the bactericidal effect of *MazF* toxin that killed all *S. aureus* containing *MazEF* TA loci.



MazE is sensitive target in antibiotic resistant S. aureus that by antiMaz-PNA the growth of S. aureus containing MazEF TA system plasmid is inhibited.

ESPID-0386

EPIDEMIOLOGY AND CLINICAL COURSE OF HOSPITALIZED CHILDREN WITH INFLUENZA A (H1N1) INFECTION DURING THE WINTER SEASON 2009 / 2010

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Introduction
During the winter 2009/2010 the peak H1N1 pandemic affected many European countries including Germany.
Objectives and Aims
Based on an established surveillance system for the parallel detection of multiple pathogens causing respiratory tract infections we intended to evaluate the effect of the H1N1 pandemic on the prevalence of other respiratory pathogens. In addition we analyzed the clinical course of the H1N1 infection compared to other pathogens.
Methods
The multiplex reverse transcription polymerase chain reaction established in our laboratory combined with a microwell hybridization assay is capable to detect nineteen different microorganisms in a single test, including: enterovirus, influenzavirus A/B/H1N1, respiratory syncytial virus, parainfluenzavirus, adenovirus, mycoplasma pneumoniae, chlamydophila pneumoniae, rhinovirus, human metapneumovirus, coronavirus, bordetella pertussis/parapertussis and legionella pneumophila. Specimens were nasopharyngeal aspirates in NaCl0.9% from hospitalized children with acute community acquired lower respiratory tract infections. Medical history and clinical course were evaluated.
Results
364 children were included. The following pathogens were detected: enterovirus [77/21,2%], influenza A(H1N1) [70/19,2%], parainfluenza I [25/6,9%], RSV [21/5,8%], adenovirus [20/5,5%], others [46/12,6%]. In 105 cases the PCR displayed negative results. In nearly 45% a preexisting condition (e.g. prematures, chronical cerebral or oncological disease) was reported. The most common symptoms found in children with H1N1 infection were fever, coughing, rhinitis and vomiting. In 14,3% we observed serious complications including one case with CPR.
Conclusions
Nearly 20% of all children hospitalized with respiratory tract infection were found to be infected with H1N1. H1N1 infection along with RSV and picorna infections were associated with a more severe clinical course.

ESPID-0387

THE EFFECTIVENESS OF ROTAVIRUS VACCINE IN PREVENTING ACUTE GASTROENTERITIS DURING ROTAVIRUS SEASONS IN POLAND

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The aim of the study was to assess the effectiveness of a completed rotavirus vaccination course in preventing acute gastroenteritis in Polish infants during their first five years of life.

There was the retrospective cohort study conducted in the Lesser Poland (Malopolska Voivodeship). The sample population included a group of 303 children who received the completed rotavirus vaccination course and 303 ones non-vaccinated against rotavirus. The date of the child's acute gastroenteritis diagnosis as well as his or her vaccination history were extracted directly from the physician's records. Each kind of diagnosed acute gastroenteritis, if it occurred during winter-spring rotavirus seasons (December to May 2007-2012), was treated as the endpoint. The relative risk of having gastrointestinal infection was assessed using proportional hazard ratio from Cox proportional hazards regression *model.*

In the examined group, 96 children (15.8%) had winter-spring gastrointestinal infections. In the non-vaccinated children the cumulative incidence of these infections in the first five years of life was 20.8% whereas in the vaccinated with Rotarix, only 10.9%. The risk (RR) of winter-spring infection during first five years of life was 0.56 (p=0.005) in the children vaccinated with Rotarix compared to the non-vaccinated population. Birth weight less than 2500g increased risk of the infection twice and also reached statistical significance (p=0.047). The effect of Rotarix was not significant only for the first year of life.

The results have showed that Rotarix is highly effective in preventing acute gastroenteritis in Polish children during rotavirus seasons.

ESPID-0388

IMMUNOGENICITY AND REACTOGENICITY OF TRIVALENT INACTIVATED INFLUENZA VACCINE (TIV) AND MF59® ADJUVANTED VACCINE (ATIV) IN 14 - 26 MONTH HEALTHY CHILDREN

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Introduction: Influenza in young children is a major cause of morbidity but currently licensed inactivated vaccines are poorly immunogenic in this age group. This may be overcome by using novel adjuvants such as MF59®.

This study in healthy children aged 14-26 months, aimed to describe the safety and immunogenicity of Fluad®, an MF59 adjuvanted trivalent vaccine (ATIV) licensed for use in Europe.

Methods : Trivalent Inactivated Vaccine (TIV, Imuvac®) and ATIV (Fluad, MF59) contained 7.5µg HA from A/H1N1, A/H3N2 and a B-strain.

Ninety children were randomised to receive two doses of TIV or ATIV, 4 weeks apart and plasma collected at baseline and days 1, 3 or 7 and 28 after dose two.

Haemagglutination inhibition (HAI) (A/H1N1, A/H3N2 and B-strain) was determined by Novartis Vaccines Laboratories and reactogenicity data collected at all visits.

Results: Following two doses of ATIV, 100% of children had HAI titres ≥1:620 to A/H1N1 and A/H3N2 compared to TIV (3% and 47% respectively). The B-strain was less immunogenic with 48% of ATIV immunised children achieving ≥1:40 versus 3% in the TIV group.

Similar proportions of children had fever(>38°C) after one dose of ATIV or TIV (9.52% vs 11.9%) and after the second dose (4.88% vs 5%).

Erythema was reported in 26.8% of children after two doses of ATIV and 10% after TIV.

Conclusion: In this study the MF59 adjuvanted vaccine was immunogenic and well tolerated in 14-26 month old children. Further work in this study will explore the enhanced immunogenicity at the cellular and gene expression level.

ESPID-0389

SENSOR FOR EARLY DETECTION OF WOUND INFECTION

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Introduction: Wound infection is the main cause of delayed or incomplete wound healing. The diagnosis of wound infections at a very early stage would be of enormous benefit in preventing the development of severe infections like sepsis.

Objective: A novel sensor is evaluated as diagnostic tool for early detection of wound infection.

Methods: The first response of the immune system to the invasion of bacteria is the activation of neutrophil granulocytes, which contain high levels of the enzyme myeloperoxidase. Thus the myeloperoxidase activity in wound fluid is an indicator of the infection status at a very early stage. As myeloperoxidase catalyzes the decomposition of hydrogen-peroxide the enzyme activity was assessed by hydrogen-peroxide detection using an electrochemical sensor. Thus the reduced hydrogen peroxide levels according to the myeloperoxidase activity of the samples were detected by the sensor.

Results: We obtained 12 different wound samples which had been classified by an experienced physician as either “not infected” or “critical”. The enzyme activities detected with our sensor were 0.72 ± 0.46 U/ml for “not infected” samples and 3.19 ± 1.01 U/ml for “critical” samples. The classification of 12 wound samples by the measuring system was compared to the classification by the physician. 11 of 12 classifications by the sensor were consistent with the physician’s assessment.

Conclusions: Our system for measuring the status of wound infection showed good correlation with physicians’ classification of wound fluid samples. It could be an objective diagnostic tool to assess the wound infection status at a very early stage.

ESPID-0390

THE BURDEN OF MANY VACCINES ANTIGENS IN CHILDREN UP TO 2ND YEAR OF LIFE HAS NO INFLUENCE ON THE DEVELOPMENT OF ALLERGY

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The aim of study was the verification of hypothesis about the association between the excessive burden of vaccines antigens in infancy and the development of allergy.

The prospective cohort study consisted of children recruited prenatally in Krakow, Poland, followed-up during first 6 years of life. Infants were vaccinated using different type of vaccines against pertussis (DTPw or DTPa) what significantly differentiated infants in terms of the vaccines antigens exposure. The allergy skin tests on 4 kind of common inhaled allergens were done in children in 6th year of life. The data about potential confounders were derived from interviews with mothers. The relationship between the large numbers of vaccines antigens exposure in infancy and positive allergy tests was determined by multivariable logistic regression, adjusted to potential confounders.

The allergy tests were done in 212 children, 28% obtained positive allergy tests. Nearly half of children (45%) with positive tests were vaccinated with DTPw, 42% with DTPa and the rest of group using mixed course. There was no significant difference in the rate of positive tests in children considering the pertussis vaccine exposure up to 2nd year of life (28.1%; 24.7%; 37.0% respectively, p=0,456). In that group which was tested, the risk of positive tests in children exposed to DTPw and mixed course of pertussis vaccine was not statistically higher compared to children vaccinated with DTPa (OR=0.37; 95%CI: 0.10-1.34 and OR=0.50; 95%CI: 0.14-1.57, respectively).

The exposure to the large numbers of vaccines antigens has no influence on the development of allergy in children.

ESPID-0391

RSV INFECTION IN PRIMARY IMMUNODEFICIENCY PATIENTS REQUIRING HSCT: NO EVIDENCE FOR BENEFIT FROM RIBAVIRIN COMBINED WITH PALIVIZUMAB OVER PALIVIZUMAB ALONE PALIVIZUMAB

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Introduction: Respiratory inflammation is a well recognised risk factor for adverse outcome of hematopoietic stem cell transplantation (HSCT) in primary immunodeficient patients. Infection with respiratory syncytial virus (RSV) is common, and despite extensive studies particularly in infants, who are prone to severe disease, no effective treatment is available. RSV specific immunoglobulins (RSVIg) are used as prophylaxis, and both RSVIg and ribavirin have been used therapeutically during infection with different successes.

Objectives and methods: To assess if ribavirin might be useful in the treatment strategy for RSV infection in immunodeficient patients requiring HSCT we retrospectively analysed a cohort of 296 patients admitted to our centre between 1992 and 2011. Twenty-one patients were identified as having had RSV infection, 7 of whom had cleared the infection prior to transplant. The remaining 14 were analysed further.

Results: A trend for longer duration of RSV infection peri-HSCT was observed for patients who received ribavirin alone or in combination with RSVIg compared to those who received RSVIg alone (178 and 43 days respectively, p=0.07). Patients in the ribavirin group were younger (4.1 vs. 16.2 months, p=0.03) at the time of RSV diagnosis and all had lower respiratory tract infection (LRTI), but none were ventilated. Only one third of patients receiving RSVIg alone had LRTI, however they did require ventilation. Additive nebulised immunoglobulin was associated with prolonged RSV-shedding (239 vs. 65 days, p=0.03).

Conclusion: Ribavirin does not seem to have a beneficial effect over RSVIg alone on the duration of RSV shedding or outcome in this immunodeficient HSCT population.

ESPID-0392

THE EXPOSURE TO THIMEROSAL FROM VACCINES (TCV) HAS NO INFLUENCE ON THE DEVELOPMENT OF ALLERGY IN CHILDREN

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The objective of this analysis was to determine the relationship between the exposure to TCV during first 6 months of life and development of allergy in children.

There was the prospective cohort study. The cohort of 268 children recruited prenatally in Krakow, Poland, vaccinated in early infancy using formula with or without thimerosal were followed-up during first six years of life. The allergy skin tests on 4 kind of common inhaled allergens were done in children in 6th year of life. The data about potential confounders were derived from interviews with mothers. The relationship between TCV exposure in infancy and positive allergy tests later on was determined by multivariable logistic regression, adjusted to potential confounders.

The allergy tests were done in 212 children. Among children who were tested, 28% obtained positive allergy tests. About 5.2% of children with positive tests were not exposed to TCV, 42% received 25-50µg of ethylmercury and the rest of group the dose above 50µg. There was no significant difference in the rate of positive tests in children considering the level of ethylmercury exposure up to 6th month of life (45.5%; 23.6%; 29.5%, p=0,310, respectively). In that group which was tested, the risk of positive tests in children exposed to the both of considered levels of ethylmercury up to 6th month of life was not statistically higher compared to not exposed children (OR=0.37; 95%CI: 0.10-1.34 and OR=0.50; 95%PU: 0.14-1.57, respectively).

The TCV exposure in infancy had no relationship with the development of allergy in children.

ESPID-0394

ACUTE GENERALIZED EXANTHEMATOUS PUSTULOSIS: A RARE DRUG HYPERSENSITIVITY DUE TO BETA-LACTAMS

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INTRODUCTION: Acute generalized exanthematous pustulosis (AGEP) is a rare drug eruption presenting with an acute, extensive formation of nonfollicular sterile pustules on an erythematous and edematous base. We report a child with disseminated pustular eruption developed within 24 hours.

CASE REPORT: A 12-years old boy was admitted to orthopedics clinic due to left elbow fracture. He was operated on and was inserted an intraarticular fixator. He was on follow-up until he had suffered intermittent fever after 3 weeks with suspected device infection. He was planned to re-operate and was put on oral ampicillin-sulbactam. Within the second day of antibiotic sudden elevation of fever, a generalized pruritic rash developed that was characterized with an erythematous base and 1-3 mm pustules all over the body; mostly around trunk and over left elbow. He had positive acute-phase reactants. Gram-staining from pustules revealed white-blood cells with no bacteria and the culture was sterile. His varicella IgM was negative and IgG was positive; excluding acute varicella infection with bacterial superinfection. His oral antibiotic was stopped and switched to teicoplanin yet his orthopedic implant infection was not excluded. Skin biopsy was done and findings were compatible with AGEP - pustular drug eruption. After a short course of steroid therapy, all lesions disappeared dramatically.

CONCLUSION: Drug eruptions are diverse and should be kept in mind. AGEP is a severe form of this entity with spontaneous resolution in less than 15 days. The disease poses a mortality rate up to 5%. Proper evaluation is necessary for correct diagnosis.

ESPID-0395

TIMING OF ADOLESCENT BOOSTER AFTER SINGLE PRIMARY MENINGOCOCCAL SEROGROUP C CONJUGATE IMMUNIZATION AT YOUNG AGE AND ROLE OF SALIVA IN EVALUATING EFFECT OF VACCINATION.

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Introduction: Due to waning antibody levels after primary vaccination, several countries are considering implementation of a Meningococcal serogroup C conjugate (MenCC) booster vaccination in adolescents.

Aim: To establish an appropriate age for an adolescent MenCC booster vaccination.

Methods: Three age-groups were recruited with healthy 10-year-olds (n=91), 12-year-olds (n=91) and 15-year-olds (n=86). All participants were primed with the MenC-PS tetanus toxoid conjugated vaccine 9 years earlier, and received the same MenCC vaccination at the beginning of the study. Blood and saliva samples were collected prior to (T0) and 1 month (T1) and 1 year (T2) after vaccination. Functional antibody levels were measured using the serum bactericidal antibody assay (SBA). MenC-PS specific IgG and IgA levels were measured using a fluorescent-bead-based multiplex immunoassay (MIA).

Results: At T0, 19% of the 10-year-olds still had an SBA titer≥8, compared to 34% of the 12-year-olds (P=0.057) and 45% of the 15-year-olds (P<0.001) All participants developed high serum antibody levels at T1. At T2, 100% of participants still had an SBA titer≥128, but the 15-year-olds showed the highest protective antibody levels and the lowest decay. MenCC vaccination also induced salivary IgG and IgA responses. These levels correlated with MenC-specific antibody levels in serum.

Conclusion: Nine years after primary MenCC vaccination adolescents develop high protective antibody levels after a booster with good persistence up to 1 year. Our results suggest that persistence of protection increases with the age at which an adolescent booster is administered and that saliva might be used to monitor antibody levels after vaccination.

ESPID-0396

SCABIES IN PEDIATRICS: ANALYSIS OF THE CAUSES OF TREATMENT FAILURE

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Introduction: Scabies is contagious cosmopolitan parasitosis related to the colonization of the epidermis by a mite: *Sarcoptes scabiei hominis*. Currently, many cases in France and in Provence Alpes Côte d'Azur East region are reported. There is no spontaneous healing and no clear therapeutic recommendations for children. The main objective of this study is to describe the different causes of treatment failure of scabies in the pediatric population. The secondary objective is to assess the risk factors for failure.

Methods: Multicenter prospective observational epidemiological study in hospitals of Nice and Fréjus St-Raphaël conducted over six months, from 20 November 2012 to 30 May 2013. Each patient was followed for at least a month to assess the therapeutic response. The inclusions were made by six doctors, all specialists in scabies.

Results: fifty patients aged 1 month to 18 years with confirmed diagnosis of scabies. Seventy-five percent of patients were successfully treated. The remaining 25% is shared by 15% of non-compliant patients and 10% lost. Our study shows that the causes of treatment failure of scabies are: young age (under 4 years), noncompliant treatment, unknown source, complicated scabies and families with separated parents.

Higher entourage to four people ($p<0.05$), the number of symptomatic individuals greater than two ($p=0.06$), precariousness ($p=0.07$) and young age ($p=0.09$) are the main risk factors for treatment failure whatever the initial position of the patients.

Conclusion: Monitoring of patients consulting for scabies is needed to optimize care, treatment of the index case and entourage are inseparable for healing.

ESPID-0397

THE POSITIVE IMPACT OF PNEUMOCOCCAL CONJUGATE VACCINE 13 ON SEROTYPES REPRESENTING CARRIAGE AND CAUSING NON-INVASIVE PNEUMOCOCCAL INFECTION IN CHILDREN

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Introduction and aims: Pneumococcal conjugate vaccine (PCV13) was introduced to the Irish childhood immunisation schedule in 2010. We assessed pneumococcal serotypes and antimicrobial susceptibilities amongst isolates representing carriage and non-invasive infections in three Dublin paediatric hospitals.

Methods: In 2013, pneumococci were collected at three paediatric hospitals in Dublin. Pneumococci were serotyped and susceptibilities to penicillin, tetracycline, erythromycin, clindamycin and levofloxacin determined. Multi-drug resistant (MDR) pneumococci were defined as isolates with complete resistance to three or more antimicrobials.

Results: Pneumococci were isolated from conjunctivitis (n=45), carriage (n=26), lower respiratory tract infection (LRTI) (n=25) and otitis media (OM) (n=15). PCV13 serotypes among conjunctivitis, carriage, LRTI and OM isolates were 13.3%, 27%, 28% and 46%, respectively. Notably, of the serotypes included in PCV13, only 19A and 3 were commonly found at any anatomical site. Serotype 10A (n=6), non-typeable pneumococci (n=5), 11A and 15B/C (n=4) were frequent in conjunctivitis. Common carriage serotypes were 35B (n=5), 15A, 19A (n=4). 15A (n=6), 19A (n=5) and 16F (n=3) prevailed in LRTI. Serotype 3 was predominant in OM (n=4) with 15A, 19A and 35B equally distributed (n=2). 40% (n=44) of isolates were non-susceptible to at least one antimicrobial, mostly associated with 15A (n=13), 19A and 35B (n=7). Non-vaccine serotype (NVT) 15A was the commonest MDR serotype (n=9).

Conclusions: The relatively low prevalence of PCV13 serotypes suggests PCV13 is positively impacting on its target serotypes. However, the frequent occurrence of NVT including MDR serotype 15A in paediatric carriage and non- invasive infection highlights the importance of continued surveillance.

ESPID-0398

REACTOGENICITY OF TWO DOSES OF A LICENSED SEROGROUP B MENINGOCOCAL VACCINE (4CMENB) AT 5 YEARS OF AGE

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Background

4CMenB is licensed in the EU for the prevention of serogroup B meningococcal disease in persons 2 months and older but has not yet been recommended for routine use in infant schedules. Some infant studies showed elevated fever rates when administered concomitantly with routine vaccines but fever was less common at 40 months of age. There are concerns that reactogenicity, particularly fever, may affect parental acceptance of 4CMenB.

Methods

A total of 99 MenB vaccine-naïve children aged 60 months were recruited as controls to two follow-on studies. They received two doses of 4CMenB, two months apart. Parents measured daily axillary temperature, local redness/swelling and pain for the week after immunisation. Solicited systemic symptoms and use of antipyretic/analgesics were also recorded.

Results

Ninety-two participants received both vaccine doses. Pain and erythema were the most common local symptoms, experienced by 80-90% of participants after either dose in both studies (severe in 4-13%). All severe pain resolved by day 4, but mild/moderate pain persisted beyond day 7 in 10-19%. Fever (>38^{o}C) was seen in 4-11% per dose. The majority of children (84 and 92%) experienced at least one solicited systemic reaction, most commonly irritability.

No serious adverse events were judged to be related to the vaccine.

Conclusion

At 5 years of age the majority of 4CMenB recipients experience injection-site pain but fever is far less common than reported in infant studies. Parents should be advised to expect injection-site pain and to consider using analgesia if the vaccine is used at this age.

ESPID-0399

PHENOTYPIC CHARACTERIZATION OF MULTIDRUG RESISTANCE PATTERNS (MDR) AMONG METHICILLIN RESISTANT STAPHYLOCOCCUS AUREUS (MRSA) FROM LIBYA

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The emergence of multi-drug resistant (MDR) among methicillin resistant *Staphylococcus aureus* (MDR-MRSA), is alarming worldwide problem. This study was performed to reanalyze a collection of methicillin-resistant *Staphylococcus aureus* (MRSA) previously reported from Libyan hospitals for the extent of MDR phenotype patterns. A total of 85 MRSA isolates previously identified using standardized and definite laboratory techniques were further analyzed. Based on the pattern of antibiotic susceptibility testing, previously reported for 8 different classes of antibiotics, MDR was identified based on the expression of resistance to 3 or more classes of antibiotics. MDR- MRSA phenotype was identified in 46/85 (54%) and specific phenotypic resistance (e.g. MLSB) were also within the MDR-MRSA. Analysis and classification of MRSA from Libyan sources is limited and antibiotic susceptibility pattern is extremely important. This limited study shows the large presence of MDR phenotypes and emphasize the important to characterize as well as classify MRSA pattern-phenotypes according to international guidelines.

ESPID-0400

THE MYTH OF REDUCED SPECIFICITY: DOES BCG VACCINATION AT BIRTH LEAD TO FALSE POSITIVE TUBERCULIN SKIN TEST REACTIONS?

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Background: The tuberculin skin test (TST) is perceived to be confounded by prior BCG vaccination and in the UK higher induration size cut-offs are considered positive in BCG-vaccinated children. Interferon-gamma release assays (IGRAs) only include antigens specific for *M. tuberculosis*.

Objectives and Aims: We sought to test whether TST responses in IGRA-negative children were affected by BCG vaccination status.

Methods: As part of a multicentre study in the United Kingdom, children were recruited following contact with a TB source case. IGRA and TST were carried out at baseline using standardised methodology. A history of BCG vaccination or presence of BCG scar was taken as evidence of BCG vaccination. Non-parametric statistical tests (Mann-Whitney and Spearman Rank) were used to assess associations.

Results: 424 children recruited; 218 (51.4%) were boys and the median age was 74 months (interquartile range [IQR]: 34-127). 177 (42.5%) children had received BCG and 102 (25.2%) had a positive IGRA test. Of the 321 children with negative IGRA tests there was no difference in the median TST between those vaccinated with BCG (n=136; median TST: 0mm [IQR: 0-7]) and those without (n=176; median TST: 0mm [IQR: 0-3]); p=0.4. There was no relationship between age and TST size (p=0.96).

Conclusions: Concerns that BCG may lead to false positive TST results are not substantiated by our study, which shows no association between BCG vaccination and TST results in children with negative IGRA tests. Consideration should be given to reviewing the UK cut-offs at which TST tests are considered positive.

ESPID-0401

RETROSPECTIVE DIAGNOSIS OF CONGENITAL CMV BY TESTING GUTHRIE CARD HEEL-PRICK BLOOD SPOTS IN A COHORT OF IRISH INFANTS

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Introduction:

Guthrie card heel-prick blood spots may be tested to diagnosis congenital CMV infection when the condition is first considered beyond the neonatal period.

Aim:

To evaluate CMV testing of Guthrie Card heel-prick blood spots for retrospective diagnosis of suspected congenital CMV infection in a cohort of Irish infants.

Methods:

Medical records and results of retrospective CMV testing of Guthrie card heel-prick blood spots from 2006-2010 were reviewed. CMV testing was performed by the National Viral Reference Laboratory.

Results:

Guthrie card heel-prick blood spots from 42 infants were tested for CMV DNA and CMV IgM from 2006 to 2010. Congenital CMV was considered: probable in 9 (21%) (CMV DNA PCR+/CMV IgM + (6) and CMV DNA PCR +/ IgM - (3); possible in 20 (47%) (CMV DNA PCR - /CMV IgM +; and unlikely in 8 (19%) (CMV PCR -/IgM - or equivocal (6 and 2). Testing was incomplete in 5 (12%) infants. 9 infants diagnosed as possible congenital CMV were reassigned as probable (7) or unlikely (2) congenital infection after chart review.

Conclusions:

Diagnosis of congenital CMV infection remains problematic if testing is not performed within the first three-weeks of life. Testing Guthrie card heel-prick blood spots clarified the diagnosis in a minority (21%) of infants with suspected congenital CMV infection. Clinical correlation is still required to clarify the diagnosis of congenital CMV infection in up to 41% of cases.

ESPID-0402

ESTIMATING THE BURDEN OF CHILDHOOD TUBERCULOSIS IN THE TWENTY-TWO HIGH BURDEN COUNTRIES: A MATHEMATICAL MODELLING STUDY

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Introduction

Confirming the diagnosis of tuberculosis (TB) in children (<15 years) is challenging and under-reporting can result. Direct prevalence estimates are lacking and current World Health Organization estimates build on paediatric notifications, adjusted upward for incomplete surveillance by the same factor as adult notifications.

Objectives, Aims and Methods

Within a mechanistic mathematical model, we combined estimates of adult TB prevalence with evidence from the natural history of paediatric TB to estimate the burden of childhood TB in the 22 high TB burden countries (HBCs). The effects of age, BCG vaccination and HIV infection were included. A household-structured model allowed estimates of household exposure and infection. Variation in BCG efficacy by latitude was tested.

Results

We estimated that in the 22 HBCs 15,319,701 [IQR: 13,766,297-17,061,821] children <15 years were cohabiting with a prevalent TB case in 2010. 7,591,759 [IQR: 5,800,053 - 9,969,780] children became infected with *Mycobacterium tuberculosis* (*Mtb*) and 650,977 [IQR: 424,871 - 983,118] developed disease. Cumulative exposure meant 53,234,854 [IQR: 41,111,669 - 68,959,804] children harboured latent *Mtb* infection. The proportion of the total TB burden that occurred in children for each country correlated with incidence, varying between 4% and 21%. 27% of paediatric cases from the HBCs were predicted to occur in India.

Conclusions

Notifications for paediatric TB are lower than the incidences estimated by our model, particularly in younger children. However the extent is highly variable between countries. Estimates of current household exposure and cumulative infection suggest an enormous opportunity for preventive therapy.

ESPID-0403

PROPHYLACTIC PROBIOTIC SUPPLEMENTATION DECREASES THE INCIDENCES OF NEC, NOSOCOMIAL INFECTIONS AND MORTALITY IN A NEWBORN UNIT: A PROSPECTIVE COHORT STUDY

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Objective: To observe if there is any difference regarding the incidences of NEC, mortality and nosocomial infections between the groups receiving prophylactic enteral probiotic supplementation or not in a neonatal intensive care unit (NICU).

Methods: The records of neonates (>1000 gr) who received routine supplementation of probiotics (*Bifidobacterium animalis, Streptococcus thermophilus*) for 6 months were compared with the neonates within the same NICU who did not receive probiotics for previous 6 months. The demographic records of all subjects hospitalized between 1 April 2010 and 31 March 2011 were evaluated and the incidences of NEC, nosocomial infections and mortality were prospectively followed within the same period after receiving approval of ethics committee. There were 119 neonates who did not receive probiotic supplementation and 78 who received making a total of 197 subjects. Mean birth weight was 2917,24±792,07 gr (1320-4100 gr) in probiotic receiving group and 2568,95±894,55 gr (1120-4170 gr) in cohort group. We used Fisher's exact test for analysis.

Results: We observed 6 prematures with NEC (6/119, %5) in cohort group who did not receive probiotic whereas no subject was diagnosed as NEC (0/78) in probiotic group (p:0.044). The rate of nosocomial infection was 17/78 (%21.8) in probiotic group whereas it was 41/119 (%34,45) in the cohort group, and it was significantly lower in probiotic group (p:0.039). There was also decrease in density of nosocomial infections in probiotic group 14,02/1000 days when compared with cohort group with the density of 22.55/1000 days (p:0.054). There was no statistically significant difference in terms of hospital stay between the groups. We observed statistically significant decrease in mortality between groups. Mortality rate was %2,56 (2/78) in probiotic group whereas %10,08 (12/119) in neonate group who did not receive prophylaxis (p:0.037).

Conclusion: We observed statistically significant decrease in the incidences of NEC and mortality between the groups who received probiotics and not. This finding is parallel with recently published meta-analyses reporting that prophylactic probiotic administration prevents NEC and its complications in neonates. In this study, we also observed a reduction in nosocomial infection rate significantly (including NEC) but borderline significance in incidence density. Certainly, we need more studies to define whether prophylactic probiotics prevent nosocomial infections and its complications in NICU.

ESPID-0404

LINEZOLID SIDE-EFFECTS CAN BE AMELIORATED BY PROTECTIVE EFFECTS OF PYRIDOXINE

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BACKGROUND: Serious gram-positive bacterial infections are common in childhood. Linezolid is the first member of oxazolidinone group in the clinical use. It shows its effect by inhibiting the 50S ribosome. However, myelosuppression has been reported as a side-effect. In this study, we aimed to show the effectiveness of pyridoxine against linezolid induced side-effects (oxidative stress and hematological complications) on an experimental animal model.

METHODS: Forty male pediatric Spraque Dawley rats were randomly seperated into four groups. We administered 1mL of saline solution to the control group (C), 125 mg/kg/day of linezolid to second group (L), 100 mg/kg/day of pyridoxine to the third group (P) and 125mg/kg/day of linezolid plus 100mg/kg/day pyridoxine to the last group (LP) for 14 days per 12 hours. Before and after this procedure, we measured complete blood count, BUN, creatinine, ALT, AST, total and direct bilirubin values. Glutathione peroxidase (GSH-Px), superoxide dismutase (SOD), catalase (CAT) and malondialdehyde (MDA) levels were measured in the erythrocytes to show oxidative stress. All analyses were made with SPSS program and $p<0.05$ was considered statistically signi?cant.

RESULTS: There was a significant decrease in white cell number in L, P and LP groups when compared to control group ($p<0.0001$). Serum ALT levels of L group was significantly higher than control group ($p<0.0001$). Activity of antioxidant enzymes SOD, GSH-Px and CAT, and level of serum MDA were higher than control group in L group. Level of MDA, which is an indicator of lipid peroxidation, and antioxidant enzyme activities were decreased in L+P given group.

CONCLUSIONS: Total leukocyte count was decreased but levels of MDA, ALT and activities of SOD, GSH-Px and CAT were increased significantly in the linezolid group when compared to the control and LP groups. These findings suggest that pyridoxine has no protective effects for linezolid-induced leukopenia and increased ALT levels. On the other hand, pyridoxine may protect against the oxidative stress that occurs in erythrocytes by reducing the activity of antioxidant enzymes and MDA levels. This study, first in the literature, examined the side effects of linezolid in pediatric rats and will hopefully be a source for the future researches.

ESPID-0405

CLINICO-EPIDEMIOLOGY OF SHIGELLOSIS IN CHILDREN SUFFERING FROM DIARRHEA IN DISTRICT LAHORE (PAKISTAN)

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Introduction: Shigellosis, a leading public health concern in developing countries causing high morbidity and mortality in younger children.

Objectives: To study the descriptive epidemiology of shigellosis in children admitted in tertiary care hospitals and to evaluate the spectrum of antibiotic resistance in *Shigella*, causing gastroenteritis in children.

Materials and Methods: A total of 126 rectal swabs were collected from children suffering from diarrhea/dysentery at Emergency Department of Mayo and Children Hospitals Lahore during February 2012 to April 2012. The samples were inoculated on XLD and MacConkey medium and suspected colonies were identified conventionally by biochemical tests.

Results: A total of 126 stool samples were examined during February to April 2012. Out of these diarrheic samples *Shigella* accounted for 5.5% (7/126), *Enterobacter* 10.3 % (13/126), *Klebsiella* 11.9% (15/126), *Salmonella* 16.6 (21/126) and *E.coli* 18.2 % (23/126). Shigella was mostly isolated from children with age group of 1-6 months and 19-24 months. Incidence was highest in the warmer month of April (57.2%) followed by March (28.6%) and February (14.3%). Feeding to children and routinely daily practices by mothers were significantly associated with shigellosis. *Shigella* isolates showed high resistance to Methicillin (85.71%) and Vancomycin (85.71%) followed by Doxycycline hydrochloride (57.14%), Gentamycin (57.14%), Amikacin (42.85%), Azithromycin (42.85%), Kanamycin (42.85%), Ciprofloxacin (28.57%), Cefexime (14.28%) and Ceftriaxone (0%).

Conclusion: Shigellosis remained underestimated in developing countries due to lack of proper diagnosis and trend of symptomatic treatment. A careful attention should be given and further studies may be conducted to control the upcoming epidemics.

ESPID-0406

PREVALENCE OF ROTAVIRUS ANTIBODIES IN BREAST MILK AND INHIBITORY EFFECTS TO ROTAVIRUS VACCINES IN VIETNAM

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Background and aims: Rotavirus (RV) is the most important cause of childhood diarrhea worldwide and several vaccines have been successfully developed to reduce the burden of disease. However, the lower vaccine immunogenicity and efficacy in developing countries might be, amongst others, related to virus neutralizing activity of breast milk. We examined possible inhibiting factors in breast milk from healthy mothers living in rural area (N=145) and urban area (N=147) in Vietnam.

Methods : Total IgA and RV specific IgA antibodies were measured in breast milk using ELISA. Neutralizing antibodies to G1P[8] (G1-VN) and G4P[6] (G4-VN) were determined using microneutralization assays. Using a plaque reduction assay, the inhibitory effect against Rotavin-M1 was examined.

Results : Total IgA concentration was significantly higher in samples from rural region (N=143) compared with urban region (N=146), while urban mothers had significantly higher RV IgA antibody titers (≥ 320) in comparison to those from rural region (25.2% vs 9.7%).

Close to half of milk samples (45% rural, 48% urban) showed no detectable G1-VN, the majority of the remaining samples showed low titers (2-16).

Undetectable and low titers of G4-VN were common in both regions whereas higher titers (≥ 32) were only found in 6% of rural samples and 5% of urban samples.

Despite these low titers, the presence of milk antibodies could still neutralize and reduce vaccine titers up to 80% or more, even at 1:8 dilution.

Conclusions : These results contribute to the understanding of interference of breast milk with rotavirus vaccine efficacy and immunogenicity in Vietnamese infants.

ESPID-0408

RISK FACTORS FOR SEVERE ROTAVIRUS ENTERITIS

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Introduction: Rotavirus infection is still the most commune etiology of enteritis in children causing often hospitalization do to severe disease.

Objectives: to identify patients predisposed to severe rotavirus enteritis.

Aim: to determine the risk factors most specific associated with severe rotavirus enteritis.

Method: A retrospective study including 217 patients aged <5 years admitted in our clinic between October 2011-December 2013 for rotavirus enteritis was initiated. They were divided in 2 groups: one with Vesikari severity score≥11 (severe enteritis: 92 patients) and second with Vesikari severity score<11 (125 patients). In both group we have counted the number of patients with each risk factor for severe rotavirus enteritis (premature birth, low birth weight, lack of breastfeed, age <1 year old, malnutrition). Then the statistic relevance of association between each risk factor and severe disease was determined.

Results: In the first group (Vesikari≥11) 29 patients experienced premature birth (31,5%), 33 had low birth weight (35,9%), 43 were breastfed (46,7%), 67 were <1 year old (72,8%), 31 had malnutrition (33,7%). In the second group (Vesikari<11) 7 patients experienced premature birth (5,6%), 10 had low birth weight (8%), 61 were breastfed (48,8%), 69 were <1 year old (55,2%), 12 had malnutrition (9,6%).

Correlation with Vesikari≥11 severity group is statistically significant ($p<0,05$) for premature birth, low birth weight, age <1 year old and malnutrition.

Conclusion: In the studied group the risk factors with significant impact on rotavirus enteritis severity were premature birth, low birth weight, age <1 year old and malnutrition.

ESPID-0410

CONTRIBUTION OF A BROAD RANGE OF BACTERIAL POLYMERASE CHAIN REACTION ASSAYS TO THE DIAGNOSIS OF OSTEOARTICULAR INFECTION IN CHILDREN

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Introduction, Objectives and aims Bacteriological diagnosis of osteoarticular (OA) infection in children is hindered by the less than optimal diagnostic yield from blood and OA cultures, especially when antibiotics are given before sampling. This study evaluates the role of a panel of multiplexed bacterial real-time PCR assays in the diagnosis of OA infection.

Methods Children who were admitted in 2013 with suspected OA infection and were blood/OA culture negative at Alder Hey Hospital underwent PCR investigations at Great Ormond Street Hospital. Based on clinical presentation and age, OA samples were tested by PCR against one or more of the following bacterial pathogens on consultant microbiologist request: *S.aureus, K.kingae*, Enterobacteriaceae, *S.pneumoniae*, Group B streptococcus and broad-range 16S r DNA PCR.

Results 27 patients were identified (median age 25 months) . The commonest PCR investigations were for *S.aureus* (27), *S.pyogenes* (25), 16S r DNA (24), *K.kingae* (19) and *S.pneumoniae* (17). Diagnostic yield was greatest for *K.kingae* (6 positives (31% of total tested)), *S.pyogenes* (3 positives (12% of total tested)) and *S.pnuemoniae* (1 positive (6% of total tested)). 2 specimens were broad-range PCR positive for *Bacillus licheniformis*. A total of 115 PCR assays were performed, yielding 12 positive patient samples (44% of patients tested). All *K.kingae* OA infections were <3 years of age.

Conclusions The diagnostic yield of bacterial PCR testing in children with OA infection is encouraging and supports investigation based on clinical assessment and possibly age criteria. PCR investigation in young children did significantly improve the identification of *K.kingae* infection.

ESPID-0411

RESPIRATORY SYNCYTIAL VIRUS INFECTION MARKEDLY INDUCES MATRIX METALLOPROTEINASE-10 IN HUMAN NASAL EPITHELIAL CELLS

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·Introduction and aims: Respiratory syncytial virus (RSV) is an important pathogen of bronchiolitis, pneumonia and asthma in young children. Matrix metalloproteinases (MMPs) play key roles in viral infection, inflammation and remodeling of the airway. However, the roles and regulation of MMPs in human nasal epithelial cells (HNECs) after RSV infection remain unclear.

·Methods: An RSV-infected model of HNECs in vitro was used and microarray analysis was performed. Expression of MMPs was confirmed by PCR and ELISA. Some cells were pretreated with various inhibitor of signaling pathways before RSV infection. Immunohistochemistry for MMP-10 was performed using lung tissue obtained from an infant who died of severe RSV infection.

·Results: In HNECs after RSV infection, mRNA of MMP-10 was markedly increased, together with induction of mRNAs of MMP-1, -7, -9, and -19. The amount of MMP-10 released from HNECs was also increased in a time-dependent manner after RSV infection as was that of chemokine RANTES. The upregulation of MMP-10 in HNECs after RSV infection was prevented by inhibitors of NF-κB and pan-PKC with inhibition of RSV replication, whereas it was prevented by inhibitors of JAK/STAT, MAPK and EGF receptors without inhibition of RSV replication. In lung tissue of an infant with severe RSV infection, MMP-10 was expressed at the apical side of the bronchial epithelial cells and alveolar epithelial cells.

·Conclusions: MMP-10 was markedly induced and released in HNECs after RSV infection and was regulated via distinct signal transduction pathways. MMP-10 may play an important role in the pathogenesis of RSV diseases.

ESPID-0412

DIFFERENCES IN GENDER-SPECIFIC MORTALITY AMONG CHILDREN IN THE NETHERLANDS TO DETERMINE NON-SPECIFIC EFFECTS OF VACCINATION

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Introduction and aims: In developing countries, vaccines have been reported to have non-specific effects on mortality, different for boys and girls and depending on type and sequence of the vaccinations. For public health it is of great relevance to assess the impact of vaccinations on mortality. Therefore, we investigated whether there were differences in gender-specific mortality among children related to the last administered vaccination in the Netherlands, where childhood vaccination coverage is high (92-96%).

Methods: Mortality data of a dynamic cohort of all Dutch children 0-11-years-old in 2000 until 2011 (Statistics Netherlands) were used. Mortality rate ratios (MRRs) for natural causes of death were computed for girls compared to boys by age group related to the last vaccination received (Table).

Results: The cohort accounted for a total of 30,023,459 person years. During the study period 21,362 children died (mortality rate 7.1/10,000 person years). MRRs for girls compared to boys ranged between 0.81 (95% CI 0.74-0.89) in children 2-13-months-old and 0.90 (95% CI 0.77-1.07) in children aged 9-11 years. No differential changes in MRRs were observed related to the type of vaccine last received.

Conclusions: In the Netherlands, a high income country, no differences in gender-specific mortality related to the type of last administered vaccine were observed. The inability to demonstrate non-specific effects of vaccination on mortality in this large population-based study is reassuring for continued trust in the safety of the national immunisation programme.

Age	Vaccination(s)
2/3/4/11 months	DTaP-HBV-IPV/Hib+Pneumo
14 months	MMR+MenC
4 years	DTaP-IPV
9 years	DT-IPV+MMR

ESPID-0413

THE EPIDEMIOLOGY OF INVASIVE MENINGOCOCCAL DISEASE SEROGROUP B IN SCOTLAND 1999-2013

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Background and aims: Meningococcal disease is a notifiable disease caused by infection with the bacterium *Neisseria meningitidis* and is a significant cause of morbidity and mortality, particularly in children. Meningococcal Invasive Disease Augmented Surveillance (MIDAS) was introduced in Scotland in 1999 to monitor the impact of the meningococcal C vaccine.

Methods: Laboratory confirmed cases of invasive meningococcal disease submitted to the Scottish *Haemophilus*, *Legionella*, Pneumococcal and Meningococcal Reference Laboratory (SHLMPRL) are routinely serogrouped.

Results: There has been an average of 70 cases of meningococcal disease serogroup B reported each year in Scotland. This has decreased from 117 cases (2.3 cases per 100,000 population) in 2000 to 37 cases (0.7 cases per 100,000) in 2013. Serogroup B is now the most commonly reported serogroup in Scotland, accounting for 77% of laboratory confirmed cases in 2013. Just over half of all cases reported are in children under five years of age (559/1028; 54.4%) and the most commonly reported clinical presentation for cases was meningitis (332 cases; 42%). There were 59 deaths reported in the time period equating to an overall case fatality ratio (CFR) of 5.7%. However, CFR was found to vary by age and clinical presentation.

Conclusions: Meningococcal disease serogroup B has declined in recent years in Scotland but remains a significant source of morbidity and mortality, especially among young children. As serogroup B disease now accounts for the majority of laboratory confirmed cases, any ability to prevent these infections could have a substantial impact on overall incidence of disease.

ESPID-0414

AETIOLOGICAL ROLE OF ORTHO- AND PARAMYXOVIRUSES IN SEVERE RESPIRATORY TRACT INFECTIONS AMONG HOSPITALIZED CHILDREN AGED <3 YEARS IN BULGARIA

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Background and aims: Influenza viruses (family *Orthomyxoviridae*); respiratory syncytial virus (RSV), human metapneumovirus (HMPV), parainfluenza viruses (PIV) type 1, 2 and 3 (family *Paramyxoviridae*) are the most common causes of acute respiratory infections (ARI) among infants and young children. The aim of this study was to determine the contribution of these viruses in cases of severe respiratory tract illness among hospitalized children aged <3 years during the 2012/13 winter season in Bulgaria.

Methods: From October 2012 until May 2013 a total of 221 nasopharyngeal swabs from children aged <3 years hospitalized for ARI in different regions of country were tested for influenza A/B viruses by Real Time RT-PCR. Influenza virus negative samples were examined by monoplex Real Time RT-PCR using specific primers/probes for RSV, HMPV, PIV1, 2, 3.

Results: A total of 41 (18,6%) samples were influenza virus positive. Influenza B and A(H1N1)pdm09 viruses were detected in 14% and 4 % of samples, respectively; a mixture of A(H3N2) and B viruses was found in 1 sample. Out of 180 influenza virus negative samples RSV, HMPV, PIV1/2/3 viruses were detected in 23%, 5,6%, 5,6%, 1,7% and 5% samples, respectively. Co-infection PIV1/PIV3 was found in 2 children (1,1%). Predominantly RSV infected children had diagnosis bronchiolitis or pneumonia. The role of HMPV in outbreak of ARI in children's social care home was proved.

Conclusions: RSV and influenza B virus were the most frequent viral pathogens causing severe ARI among children < 3 years of age during the 2012/13 winter season in Bulgaria.

ESPID-0417

PREDICTIVE VALUE OF THE KOBAYASHI SCORE FOR IVIG RESISTANCE OR CORONARY ARTERY ANEURYSMS IN KAWASAKI DISEASE IN THE UK

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Aims: The Kobayashi Score (KS) predicts intravenous immunoglobulin (IVIG) resistance in Japanese children with Kawasaki Disease (KD) and can identify those who will benefit from early corticosteroids. Our retrospective case review, tested the ability of the KS to predict IVIG resistance and coronary artery aneurysm (CAA) development in a single London centre.

Methods: Children treated for KD between 2005-2013 were identified by their discharge diagnosis. Of 78 children, 70 had notes available. Demographic, clinical, laboratory, and echocardiography data were recorded, and the KS was calculated. Analysis was by Fishers Exact.

Results: 70 cases, representing a range of ethnicities, had a mean age of 31.6 months; 48/70 were male. 11 cases had incomplete information for calculation of the KS. Of 59 remaining cases, 37 were high risk (score ≥4); mean=4.6.

15/59 children required second-line treatment after IVIG but this was not predicted by a high KS (9/15 vs 28/44 with score ≥4; p=1.00). PPV for IVIG resistance was 0.24, NPV 0.73, sensitivity 0.6 and specificity 0.36.

20/59 had CAA or dilatation, 1 had no echo result. CA abnormalities were not predicted by KS (12/20 vs 25/38 with score ≥4; p=0.78). PPV for CA abnormalities was 0.32, NPV 0.62, sensitivity 0.6 and specificity 0.34.

Conclusion: The KS does not predict IVIG resistance, or CA abnormalities in our population. Together with similar data from a larger US study, this highlights the need to devise a new score for use outside Japan that can identify children who are at increased risk of CAA.

ESPID-0419

AGE-SPECIFIC MUMPS VACCINE EFFECTIVENESS IN HOUSHOLD MEMBERS OF PRIMARY SCHOOLCHILDREN IN THE NETHERLANDS

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Background and aims: Between August 2007 and May 2009, a mumps outbreak occurred in the Netherlands mainly among Orthodox Protestant residents with low vaccination coverage. During this outbreak, a cross-sectional study in primary schoolchildren and their household members was conducted to estimate mumps vaccine effectiveness (VE). Here we presented age-specific VE estimates in households. MMR-vaccine is given at 14 months and 9 years of age.

Methods: Eight primary schools with transmission of mumps virus were included in the study. The MMR vaccination coverage of the schools ranged between 34% and 93%. Parents of schoolchildren were asked to fill in a questionnaire collecting information on the occurrence of mumps in the household. We used self-reported vaccination status. Age-specific VE was estimated in households with at least one person with self-reported mumps (all household members, including the index case) using multilevel analysis adjusting for household.

Results: VE for mumps differed by age group. VE is high among 1-4-year-olds followed by a decrease for 5-8-year-olds (Table). Following the booster dose VE increased again and thereafter declined by age group.

Conclusions: We showed that MMR-vaccine has a high effectiveness against mumps in primary schoolchildren and their household members. After the first MMR as well as after the booster a decrease is observed in VE. By including also index cases, the VE may be overestimated due to differential exposure between vaccinated and unvaccinated individuals.

Age-group (yrs)	VE (95%CI)
1-4	95.3 (80.5-98.9)
5-8	81.6 (52.4-92.9)
9-12	94.2 (80.8-98.3)
13-16	73.2 (-56.3-95.4)
17-26	NA
>=27	58.6 (-252-95.1)

ESPID-0421

PNEUMOCOCCAL MENINGITIS AND SEPTIC SHOCK CAUSED BY PROBING AND DRAINAGE OF THE LACRIMAL DUCT IN 7-WEEKS-OLD BOY (CASE REPORT)

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Congenital lacrimal duct stenosis commonly causes bacterial dacryocystitis in infants. Surgical probing and drainage is frequently recommended treatment in cases refractory to conservative therapy. Complications are rarely observed.

We report the case of otherwise healthy 7-weeks-old boy who suffered from congenital dacryostenosis. Cultivation of a swab from his lacrimal sac revealed *Streptococcus pneumoniae*. The boy underwent probing and drainage of the lacrimal duct. 24 hours after the procedure he developed meningitis and septic shock with multiple organ dysfunction syndrom. *Streptococcus pneumoniae* (serotype 11A) was isolated both from his conjunctivae and cerebrospinal fluid. The course of the disease was further complicated by subdural empyema and development of a 4-ventricle hydrocephalus and led to serious long term sequelae.

The time of onset of the disease and the cultivation findings are indicative of a causal link between probing and irrigation of the lacrimal passages and generalization of the infection (probably hematogenous). This source of an invasive pneumococcal disease is unique.

ESPID-0423

IMMUNOGENICITY AND REACTOGENICITY OF 2 DOSES OF A LICENSED SEROGROUP B MENINGOCOCCAL VACCINE ADMINISTERED TO 4-YEAR-OLD CHILDREN

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Background: In January 2013, a recombinant serogroup B meningococcal vaccine (4CMenB) was licensed in the European Union for immunization of persons aged 2 months and above. We assessed the immunogenicity and reactogenicity of this vaccine in healthy children.

Methods: 209 serogroup B meningococcal (MenB) naive subjects aged 4 years were enrolled in the United Kingdom, Italy, Spain and Czech Republic and received two doses of 4CMenB administered 2 months apart. Blood samples were obtained at baseline and one month following the second dose. The proportion of subjects with human complement serum bactericidal activity (hSBA) titers ≥1:5 against four reference strains were determined: H44/76 (for vaccine component fHbp), NZ98/254 (PorA), 5/99 (NadA) and M10713 (NHBA).Geometric mean titers (GMT) and associated 95% CIs were also calculated. Solicited reactions were collected for 7 days after each dose.

Results: At baseline, fewer than 5% of subjects had hSBA titers ≥1:5 for H44/76, 5/99 and NZ98/254, compared with 61% for M107013. This proportion was 91-100% one month after the second dose for all 4 strains. GMTs and 95% CIs one month after the second dose were: 110 (99-122) for H44/76; 341 (301-388) for 5/99; 17 (14-19) for NZ98/254 and 48 (41-56) for M10713. Transient severe local pain was observed in 13% (1st dose) and 11% (2nd dose) of participants. Fever was reported in 9-10% of participants; no subjects had temperature ≥40°C within 3 days of vaccination.

Conclusion: 4CMenB is immunogenic at 4 years of age in this licensed schedule.

ESPID-0425

EFFICACY OF SHORT-COURSE INTRAVENOUS ANTIBIOTICS THERAPY FOLLOWED BY ORAL THERAPY FOR FEBRILE URINARY TRACT INFECTION IN CHILDREN

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Background

Urinary tract infections (UTI) are common bacterial infections in children. In acute management, the duration of intravenous antibiotic therapy is not associated with therapeutic failure. Hence, short-course (2–4 days) intravenous therapy followed by oral therapy is considered acceptable.

Methods

We investigated children aged <2 years, hospitalized for initial febrile UTI, at 2 hospitals in Japan from April 2011 to December 2013. To evaluate the efficacy of short-course intravenous therapy, children were classified into Group 1 (2–4 days), Group 2 (5–10 days), or Group 3 (11–14 days) according to the intravenous therapy duration.

Results

Fifty-one children (15 [29%] female patients; mean age, 4.1 months) were hospitalized because of UTI; all were treated with antibiotics, including intravenous and oral agents, for 7–14 days. The predominant pathogen was *Escherichia coli* (45/51, 88%). We classified 24, 22, and 5 children into Groups 1, 2, and 3, respectively. All cases in Group 3 were complicated with bacteremia on admission. The clinical and laboratory characteristics, and efficacy in Groups 1 and 2 did not differ significantly; however, the length of hospital stay was shorter in Group 1 (mean, 6.5 days) than in Group 2 (mean, 9.6 days). Furthermore, complications after admission (e.g., other infections and injuries due to infusion) were less common in Group 1 (1 child) than in Group 2 (6 children).

Conclusions

Short-course intravenous antibiotic therapy for UTI in children was as effective as long-course intravenous therapy; further, it reduced the incidence of complications after admission.

ESPID-0426

INCIDENCE OF NOSOCOMIAL BLOOD STREAM INFECTIONS IN THE INTENSIVE CARE UNITS IN TWO EGYPTIAN UNIVERSITY HOSPITALS

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Background: Nosocomial infections (NCIs) are more frequently encountered in ICUs and represent a major socioeconomic burden.

Aim of the Work: Evaluating the rate, causative microorganisms, antimicrobial resistance, outcome of infection, risk factors, and most common isolates with molecular detection of the resistance gene in nosocomial blood stream infections (BSIs) in both adult and neonatal ICUs,

Methods: 1091 patients (adults & neonates) admitted to the ICUs between March 2012 and February 2013 were included. Detection of ESBL producers was conducted by a screening test and confirmed by double-disc synergy test (DDST). Coagulase negative staphylococci (*CoNS)* isolates were tested by PCR for detection of *mecA* gene. 250 intravenous catheters (IVCs) were cultured to detect primary BSIs.

Results: 117 patients (10.7%) had nosocomial BSIs. Gr +ve organisms were reported in 84 (62.2%); *CoNS* was the most prevalent (37%) followed by *S. aureus* (12.6%). *K. pneumoniae* was the most common Gram –ve isolate (12.6%) followed by *Acinetobacter baumannii* (11.1%). *Candida albicans* was reported in only 5 isolates (3.7%). Gr +ve isolates were mostly sensitive to vancomycin (95%), while Gr –ve isolates were mostly sensitive to levofloxacin (63%). 66 % of CoNS (33/50) were *mecA* gene producers while 96% (48/50) were cefoxitin resistant and to other B-lactam antibiotics. Regarding the 250 IVCs cultured, 20 (8%) were culture positive. The highest number of isolates was reported from the NICU and *CoNS* was the most common isolate (80%). These cases represent BSI with a primary site at the vascular access catheter insertion point.

Conclusion: Vancomycin is the most reliable treatment option for BSIs, however over-use may lead to emergence of resistance.

ESPID-0427

INFECTIVE ENDOCARDITIS CAUSED BY MORGANELLA MORGANII IN A IMMUNOCOMPETENT PATIENT WITH CHRONIC OTITIS MEDIA

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Morganella morganii is a gram negative aerobe, found often as intestinal commensal. It is commonly implicated in urinary tract infections and pyogenic infections, but rarely causes bacteremia. We report herein a case of a 15-year-old boy who presented with recurrent headache, tinnitus and fever for 7 days. Right tympanic membrane perforation was found in his physical examination. Chronic otitis media, acute sinusitis and increased aeration of mastoid bones was identified on temporal bone CT. Meropenem and vancomycin were started. Meanwhile, *Morganella morganii* was isolated from blood culture. Gentamicin was added to meropenem. The transthoracic echocardiogram revealed 10 mm of vegetation on the tricuspid valve. Medical follow-up and close monitoring were suggested by cardiovascular surgery. Drug abuse and suspected sexuel activity were not determined. Primer and secondary immundeficiency were not identified. We investigated for urinary and gastrointestintal truct pathologies. Thus, a ulcerated polypoid lesions where was at the level of 6 to 9 hours were seen in anal canal on colonoscopy. Biopsy of the lesion was consistent with adenomatous polyps. In light of all these results, infective endocarditis caused by *Morganella morganii* was thought to be due to the chronic otitis media. The transthoracic echocardiogram revealed only thickening of the tricuspid valve after a total of 8 weeks of meropenem treatment. The patient was discharged and still being followed up with outpatient follow-up. To the best of our knowledge, the patient is the first immunocompetent patient suffering from infective endocarditis caused by *Morganella morganii.*

ESPID-0428

A RANDOMISED INTERVENTION TRIAL TO EVALUATE CORTICOSTEROID REPLACEMENT THERAPY IN CHILDREN WITH SEVERE SEPTIC SHOCK

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Introduction: Sepsis remains an important cause of childhood death and disability. Without evidence of benefit, or of causing no harm, low-dose corticosteroid replacement therapy is used on PICU for children with severe septic shock.

Aims: We aimed to explore potential endocrine and immune-modulatory effects of corticosteroids to inform a potential phase 3 trial.

Methods: Three UK PICU's recruited children with severe sepsis. After an ACTH test, patients were randomised 2:1 to standard care plus hydrocortisone (25 mg/m^2/q 6 hourly for 48 hours) or to standard care. Clinical data and laboratory samples (endocrine, coagulation, cytokine) were collected through day 6 and in convalescence. Research Ethics 07/H0504/139.

Results: 29 children, median age 60 months (range 5-177) were recruited. In descriptive preliminary analysis, there were no clinically significant differences in baseline data between the intervention and control groups (median PIM score 6.3 (range 0.1-31.6)). ACTH test was abnormal in 6/29 of whom 67% died (n=4) compared to patients with a normal ACTH test of whom 4% died (n=1). Twenty patients received corticosteroid replacement therapy. Mortality in the corticosteroid and control groups was 22% and 17%, respectively (not significant), and the median Composite-Time-to-Complete-Organ-Failure-Resolution (CTCOFR) scores were 4 in both groups. Preliminary data on cortisol levels did not differ significantly between groups.

Conclusions: These preliminary data suggest that corticosteroid replacement therapy does not influence cortisol levels in children with severe septic shock. Detailed analysis of cytokine and coagulation responses, and gene array data, are currently being performed.

ESPID-0429

POTENTIAL DISCHARGE OF FEBRILE INFANTS AT 36 HOURS FOLLOWING NEGATIVE BLOOD CULTURE RESULT: AN AUDIT

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Aims

To determine if previously well infants (<1 year) with undifferentiated febrile illness and negative blood culture (BC) at 36 hours could have antibiotics stopped safely. Currently 48 hours BC result informs discharge. Some neonatal units stop antibiotics at 36 hours if BC negative and well. Reduction in admission length/cost are estimated at a large general paediatric unit.

Method

Retrospective case-note review of infants on whom BC was taken on admission over an 18 month period from October 2012. Infants with significant previous illness were excluded. 40 BC positive infants (6 notes missing) and 807 BC negative infants identified. Time to positivity was recorded (BacT-Alert). Features suggestive of bacteraemia were identified. Using a case-control study, all 34 positive, and 68 BC negative infants were compared. Two trainees independently assessed whether BC negative infants could have been safely discharged at 36 hours. Discordant (n=3) results were consultant moderated.

Results

No significant BC became positive after 30 hours. 29/68 (43%) BC negative children were assessed as safe for discharge at 36 hours, mean admission length was 57 hours. Children are not normally discharged between 21.00-09.00, we estimate children could have been discharged 10 hours earlier on average. This could have saved 96 bed days (£47,000) per year, assuming timely discharge, and our retrospective assessments correct.

Conclusion

Previously well, febrile infants may be safely discharged following a negative blood culture at 36 hours if clinically well, with significant potential benefits for hospital and family. We intend to reaudit following a change in policy.

ESPID-0430

RABIES CASES IN CHILDREN ADMITTED TO THE PAEDIATRIC INFECTIOUS DISEASES UNIT OF MULAGO NATIONAL REFERRAL HOSPITAL FROM 2010 - 2012

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Introduction: Rabies a zoonotic disease leads to rapidly progressive and almost universally fatal encephalitis in humans. Despite being a preventable disease by vaccinating primarily susceptible animals and exposed humans, canine rabies kills about 55,000 people annually in Asia and Africa. It remains a relatively common problem in developing countries including Uganda due to lack of immunization of susceptible domestic animals especially dogs and exposed humans particularly children due to limited awareness & access to vaccination.

Objectives: Document the magnitude and clinical outcome of Rabies in children admitted to Mulago Hospital.

Aim: Raising awareness of Rabies as a disease of public health importance in children.

Methods: We conducted a records review of Rabies cases admitted to the pediatric infectious diseases unit of Mulago Hospital from 1st January 2010- 31st December 2012 documenting the demographic characteristics, duration of hospitalization and outcome.

Results: Thirteen Children with Rabies were admitted during the review period: 8/13(61.5%) were from Kampala city. The age range was 1yr - 12yrs (average 7.6 years): 8/13(61.5%) were aged 7 years or older, 4/13(30.8 %) were aged 5-6 years, 11/13(85%) were males. All 13 children died. Almost all of the cases were bitten by rabid dogs. Average hospital stay was 3.8 days (range 1-13 days) and 7/12(58%) died within 1-3 days of admission.

Conclusions: Rabies infection remains a fatal disease of public health importance in Uganda especially in Children, requiring concerted effort by veterinary & health professionals to vaccinate all susceptible domestic animals especially dogs and exposed humans especially children.

ESPID-0431

BURDEN OF INFLUENZA B INFECTIONS IN CHILDREN IN THE COMMUNITY

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Introduction
Influenza A infections are generally regarded as clinically more important than B infections.
Objectives and aims
Despite some recent studies providing increasing evidence for the clinical importance of B infections, scarce data are available on the overall burden of influenza B illnesses in children.
Methods
We performed a prospective cohort study of respiratory infections in outpatient children aged ≤13 years during two consecutive winter seasons (total, 2231 child-seasons). The children were examined at the study clinic during symptoms of respiratory infection, and nasal swabs were obtained for determination of the viral etiology of the illness. Detection of influenza viruses was based on viral culture and subsequent immunoperoxidase staining. The parents filled out daily symptom diaries.
Results
Of 361 influenza infections in which the viral type was confirmed, 59 (16.3%) were caused by B viruses. The corresponding proportions of B viruses among children aged <3, 3-6, and 7-13 years were 11.7%, 17.5%, and 21.1%, respectively (P for trend = 0.06). Among children with influenza B, the median durations of fever and any symptoms were 4.0 and 9.5 days, respectively; acute otitis media developed in 23.7%; and 30.5% were treated with antibiotics. For every 100 children with influenza B, there were 250 days of children´s absenteeism and 137 days of parental work loss. No significant differences were observed in any outcomes between influenza A and B.
Conclusions
Influenza B viruses place a substantial disease burden on children in the community. The clinical features of B viruses are comparable to A viruses.

ESPID-0432

ANTIMICROBIAL PRESCRIBING IN A TERTIARY PAEDIATRIC HOSPITAL IN SINGAPORE: VALIDATED POINT-PREVALENCE DATA

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Background, Objectives and Aims: Antimicrobial resistance is an increasing problem in paediatric care in South East Asia, but only very few data exist on antimicrobial prescribing patterns from this region that could guide antimicrobial stewardship interventions. This study is one of the first in this region to systematically evaluate paediatric antimicrobial prescribing, aiming to inform future antimicrobial stewardship interventions.

Methods: This prospective point prevalence study collected prescribing data on eight time points over a four month period in a tertiary paediatric unit in Singapore on the four most common empirically prescribed broad spectrum antibiotics (meropenem, piperacillin-tazobactam, ceftriaxone and vancomycin). To validate the survey data, actual electronic prescription data for the same time period were analyzed, correlating the number of patients on antibiotics with the total number of patients.

Results: By point prevalence, 100 episodes of antibiotic prescribing were captured, with rates of patients on antibiotics ranging from 6.9% (paediatric nephrology) over 13.1% (general paediatrics), 26.1% (paediatric oncology) to 77.4% (PICU); mirrored well by actual prescription data (9.9%, 9.2%, 29.1% and 63.9%, respectively). Out of prescriptions with duration of >2 days, only 19% were appropriately following microbiological results; 48% were not discontinued despite negative cultures, in 15% prescribing was not modified according to culture results, and in 18% no culture was done at all.

Conclusions: These data show that that antimicrobial prescribing rates are high in this department, and indicate intervention points for antimicrobial stewardship. Further research is required into the causes for high prescribing rates.

ESPID-0433

SUPERANTIGEN GENE PROFILE OF PHARYNGEAL ISOLATES OF STREPTOCOCCUS PYOGENES IN SCHOOL CHILDREN IN CHENNAI, SOUTH INDIA

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Pathogenesis of invasive infections caused by *Streptococcus pyogenes is related to the secretion of streptococcal superantigens (SAgs). However, there is scant information about the superantigen profile of non invasive isolates of S.pyogenes . The aim of this work was to study the distribution of SAg genes in a collection of non invasive pharyngeal isolates of S.pyogenes.*

Forty nine pharyngeal isolates of S.pyogenes isolated from school children aged 5-16 years which included cases of pharyngotonsillitis (n=21) and carriers(n=28), were included in the study. The genes speA, speB, speC, smeZ, speH, speJ, ssa, speF,speG were detected by PCR . *Emm* gene typing was done by standard methods (http://www.rediffmail.com/cgi-bin/red.cgi?red=http%3A%2F%2Fwww%2Ecdc%2Egov%2Fncidod%2Fbiotech%2Fstrep%2Fstrepblast%2Ehtm&isImage=0&BlockImage=0&rediffng=0).

Spe B, a cysteine proteinase was detected in all the strains. *Spe A* was detected in 26.5% of the strains and *spe C* in 22.4% of strains. The most common superantigen gene was *spe G* which was seen in 85% of strains. Three of the 4 isolates which belonged to genotype *emm 42* , harboured 3 to 4 genes, whereas one isolate carried only *spe B* and none of the toxin genes. Twenty six emm types were seen among the 49 strains studied. *Emm 89.0b* was the most common emm type (12/49 ,24.4%). Ten different Sag profiles were observed in these 12 isolates and all of them harboured between 6 and 8 superantigen genes.

The pharyngeal isolates showed great diversity in their emm types as well as SAg profiles. Majority of the isolates (48/49) harboured 3 to 8 superantigen genes.

ESPID-0435

PERTUSSIS ANTIBODY RESPONSES IN MATERNAL AND CORD SAMPLES AFTER VACCINATION DURING PREGNANCY: A VIETNAMESE - BELGIAN COLLABORATION

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o Background and aims

We present interim results of a study on 2 different tetanus-diphtheria-acellular pertussis (Tdap) vaccines administered during pregnancy. The overall aim is to measure the response on Tdap vaccination during pregnancy and the effect of maternal antibodies in infants.

o Methods

In a prospective cohort study, Boostrix® is administered to pregnant women in Belgium and Adacel® in Vietnam. The control group receives no vaccine in Belgium, or monovalent tetanus vaccine in Vietnam (Ivac®). Interim results are presented for blood samples (5cc) collected right before and 1 month after maternal vaccination and at delivery from the women and the cords. IgG against PT, FHA and PRN are measured with ELISA. A positive response is a postvaccination IgG titer of ≥ 20 IU/mL if the prevaccination titer is <5 IU/mL, a fourfold rise if the prevaccination titer is 5-20 IU/mL or a two-fold rise if the initial titer is >20 IU/mL.

o Results

Besides the different vaccines used, populations are different in terms of age and background vaccination. A significantly lower mean ratio of cord/ maternal anti-PT antibody titer at birth is found in Vietnamese women ($p<0.001$). More women have a positive response to the pertussis antigens in Boostrix®. The graph summarizes the results.

o Conclusions

Boostrix® induces significantly ($p=0.012$) more positive responses to pertussis antigens in Belgium compared to Adacel® in Vietnam. Early life humoral immunity and influence on vaccine response of the infant will be assessed later.

		Group 1: Boostrix Belgium	Group 2: Control Belgium	Group 3: Adacel Vietnam	Group 4: Tetanus Vietnam
Number of participants in interim analysis		57	35	55	51
Mean age in years		30.5 y	31.9 y	25.7 y	24.8 y
Number of samples tested	Prevacc	57	25	53	51
	Postvacc	57	-	51	-
	@ delivery	56	25	42	31
	Cord	56	25	34	25
Mean ratio cord/maternal anti-PT antibodies		3.5	3.4	1.6	1.3
N Positive response to vaccine Anti-PT (%)		45 (79%)	0	25 (49%)	0
N Positive response to vaccine Anti-FHA (%)		51 (89%)	0	45 (88%)	0
N Positive response to vaccine Anti-Prn (%)		57 (100%)	0	51 (100%)	0

ESPID-0436

CURRENT STATUS OF BACILLE CALMETTE GUERIN (BCG)IMMUNISATION IN EUROPE-A PTBNET SURVEY

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Background

The incidence of tuberculosis and use of BCG differs greatly worldwide. Information regarding recent changes in BCG vaccination policies are difficult to access. This study aimed to collect up-to-date data on the use of BCG in Europe.

Methods

Web-based survey including all members of the pediatric-tuberculosis-network-European-trials-group and tuberculosis-network conducted between October 2012 and May 2013.

Results

Within Europe a total of 89 individuals from 31 countries participated in the survey (**Table**). Participants from 27/31 (87%) countries reported to have a national BCG immunisation policy/guideline. Reported indications for BCG immunisation were: routine at birth (14/31;45%), routine at older age (2/31;6%), routine at birth for high-risk groups (12/31;39%), routine at older age for high-risk groups (6/31;19%), routine at older age for Mantoux-negative (6/31;19%), routine for immigrants (4/31;13%) and as a travel vaccine (10/31;32%). Members from 10/31 (32%) countries reported changes in BCG policies in the recent 5-year-period: discontinuation of routine immunisation of infants/children (6/10) reintroduction of immunisation of high-risk children (3/10), and change in BCG vaccine strain (2/10). Members from 24/31 (77%) countries reported using BCG Denmark, 6/31 (19%) other strains and 10/31 (32%) did not know the strain used in their country.

Conclusion

The survey shows the majority of European countries have BCG immunisation policies. Indications for BCG immunisation varied considerably, likely reflecting national TB incidence rates, and other factors influencing immunisation policies. Importantly, the considerable number of recent policy changes highlights the need for regular collection of up-to-date information.

Table: Demographics of participants

Number of participants	**n**	**%**
Total	108	100
Europe	89	82
Asia	8	7
Americas	7	7
Africa	4	4
Professional characteristics	**86**	**100**
Grade		
Senior doctor (consultant and above)	70	81
Junior/middle grade doctors	13	15
Other	3	4
Main area of work		
Adult Pulmonologists	28	33
Paediatric pulmonologists	16	19
Paediatric infectious diseases specialists	16	19
Other	26	29
Place of work		
Tertiary/quarternary care	61	71
Secondary care	10	12
Primary level	4	5
Other	11	13

ESPID-0437

COMPARISON OF FREQUENCY OF DIFFERENT ETIOLOGIES AMONG CHILDREN WITH COMMUNITY-ACQUIRED PNEUMONIA IN THREE DISTINCT SEVERITY SUBGROUPS

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Aims: We assessed whether there is difference on the frequency of different etiologies among children with community-acquired pneumonia (CAP) in three distinct severity subgroups.

Methods: This was a prospective study at the Federal University of Bahia Hospital, in Salvador, Brazil. Children <5-years-old hospitalized with CAP in a 21-month period were investigated. On admission, clinical data and biological samples were collected to investigate 18 etiological agents (11 viruses, 7 bacteria). Severity was assessed based on the World Health Organization criteria for children aged ≥2 months.

Results: Out of 277 enrolled patients, 13 (4.7%) were <2-months-old, 27 (9.7%) did not present tachypnea or any danger sign and the respiratory rate was not registered for 2 (0.7%). Therefore, this study group comprises 235 patients. There were 137 (58.3%) boys and the median (interquartile range) age was18 (10-28) months. Cough (97.9%), fever (96.6%), and difficulty breathing (88.1%) were the most frequent complaints and tachypnea (91.5%), chest indrawing (63.0%), somnolence (11.5%), supraclavicular recession (1.7%), and grunting (0.4%) were the signs found that were used for the severity assessment. Overall, etiology was detected among 193 (82.1%) cases. Table 1 shows the comparison of different etiologies among distinct severity subgroups.

Conclusions: Etiology was significantly more detected among children with severe or very severe CAP. A trend on increase of pneumococcal infection frequency was observed in severe/very severe cases. No difference was found on the frequency of invasive pneumococcal infection among the distinct severity subgroups.

Etiology	Non-severe (n=73)	Severe or very severe (n=162)	P	Severe (n=134)	P	Very severe (n=28)	P
Detected	52(71.2)	141(87.0)	0.003	119(88.8)	0.001	22(78.6)	0.5
Viral	30(41.1)	75(46.3)	0.5	65(48.5)	0.3	10(35.7)	0.6
Bacterial	22(30.1)	66(40.7)	0.1	54(40.3)	0.1	12(42.9)	0.2
Typical bacteria	14(19.2)	51(31.5)	0.05	42(31.3)	0.06	9(32.1)	0.2
Atypical bacteria	8(11.0)	15(9.3)	0.7	12(9.0)	0.6	3(10.7)	1
Pneumococcal infection	8(11.0)	35(21.6)	0.05	28(20.9)	0.07	7(25.0)	0.1
positive blood culture	3/67(4.5)	5/152(3.3)	0.7	3/125(2.4)	0.4	2/27(7.4)	0.6
positive blood PCR	1/70(1.4)	6/155(3.9)	0.4	5/130(3.8)	0.7	1/25(4.0)	0.5
invasive infection	3/69(4.3)	10/159(6.3)	0.8	8/132(6.1)	0.8	2/27(7.4)	0.6

Results in n(%) Comparison of non-severe cases with the others by the World Health Organization criteria

ESPID-0439

INCIDENCE OF AND RISK FACTORS FOR HEALTHCARE-ASSOCIATED UPPER RESPIRATORY TRACT INFECTIONS IN A PEDIATRIC HOSPITAL IN ARKHANGELSK, NORTHWEST RUSSIA

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Background and aims: Upper respiratory tract infections (URTI) spread easily in pediatric hospitals, causing healthcare-associated infections. The study aims to assess incidence of and risk factors for healthcare-associated URTI in a large pediatric hospital in Arkhangelsk, Northwest Russia.

Methods: We conducted a prospective active surveillance for healthcare-associated URTI in the pediatric hospital during 2012. Healthcare-associated URTI was diagnosed if symptoms of acute respiratory infection developed at the hospital and were not present on admission or within the first 48 hours of hospital stay. Risk factors for healthcare-associated URTI were searched by using multivariate logistic regression analysis.

Results: Altogether 979 patients were enrolled. The incidence of healthcare-associated URTI was 7.1 per 100 admissions. Compared to infants, children older 3 years (OR=0.3, 95%CI: 0.1-0.8) were less likely to have healthcare-associated infections. Hospital stay 8-14 days (OR=5.3, 95%CI: 2.5-11.0) and more then 14 days (OR=37.9, 95% CI: 15,6-91,7) was associated with healthcare-associated URTI compared to stay for less than 7 days. Admission during winter-spring season (OR=3.0, 95%CI: 1.6-5.6) and presence of a relative caring for the patient (OR=5.2, 95%CI: 1.1-23.9) were positively associated with healthcare-associated infections.

Conclusions: Seven out of a hundred patients hospitalized in the pediatric hospital gets healthcare-associated URTI. Age less than 3 year, longer hospitalization time (more than 7 days), admission during winter-spring season and presence of a relative caring for the patient were found to be risk factors.

ESPID-0440

RISK MARKERS FOR PERTUSSIS AND PERTUSSIS VACCINATION STATUS AMONG YOUNG INFANTS – A CASE - CONTROL STUDY

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Background and aims: Pertussis is a contagious bacterial disease. During 2011-2012 pertussis incidence rates in Israel soared, especially in infants under 1 year (>300/100,000). We aimed to investigate risk markers for pertussis.

Methods: A case-control study in the Jerusalem district (1998–2011). Data collected: epidemiological and clinical investigations and vaccination records. Vaccination status was defined as number of pertussis vaccine doses received (the current routine schedule includes 3 doses at 2,4,6 months, booster doses at 12 months, 7y and 13y)

Results: The study population included 1268 infants under 1 year: 317 pertussis cases and 951 age-matched controls (mean age 3.95±3.01, median 2.9 months).

The cases had a higher proportion of males (56.8% vs. 50.8%), of low birthweight (<2500 gram, 12.3% vs. 6.3%) and a higher child's rank in the family (53% ranked 4 and above vs. 37.7%).

Some 40% of the cases (127/317) were hospitalized, most (111,87.4%) were under 4 months (mean age 2.42±2.1, median 1.83 months).

Vaccination status: the distribution of 0,1,2 and 3 pertussis vaccine doses differed significantly being 62%,21.7%,10.7%,5.7% vs. 43.3%,26.6%,15%,15% among cases and age-matched controls, respectively.

The proportion of unvaccinated infants (age-appropriate) at ages 2-3,4-5 and 6+ months was 56.8%,29.8% and 34.8% vs. 30.4%,9% and 4.6% among cases and controls.

The vaccine effectiveness was 84%,71% and 67% for 3, 2 and 1 pertussis vaccine doses, respectively.

Conclusions: Specific risk markers to pertussis were identified. Pertussis cases were significantly more likely to be unvaccinated and to have delayed vaccinations. Vaccine effectiveness increased with the number of vaccine doses.

ESPID-0441

MOTHER TO CHILD HIV TRANSMISSION IN SPAIN: SOME THINGS ARE CHANGING

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Background

In Europe, mother-to-child transmission (MTCT) of HIV has experienced a decreasing incidence (<1%) comparing with other perinatal infections, reflecting effective prevention programmes. We want to analyse the temporal trends in MTCT in our hospital, with anaverage of 5,500 deliveries/year.

Methods

Analysis of all new borns from HIV infected mothers (NB-HIV) in our hospital, during 2000-2012.Three different periods were considered according to the active national programmes: 2000-04; 2005-07; 2008-12. Epidemiological and clinical features were assessed.

Results

208 NB-HIV were included (2000-12): 39.9% (2000-04); 28.4% (2004-07); 31.7% (2008-12). 24.4% of the mothers were foreign. An increased prevalence of foreign mothers from countries with high HIV-prevalence was observed: 9.6%, 33.9%, 43.9%. This group had adequate HIV diagnosis before pregnancy (86.0%) and a higher proportion of detectable HIV-viral load before birth compare to the Spanish Group (21.6%/13.2%). Mean age was 30.5 years (SD 6.30); number of mothers >25 (81.3%)increased: 35.7%, 85.7%,88.6% (p=0.07). 13% had a history of intravenous drug use: 55.6%, 29.6%, 14.8%. Proper antiretroviral therapy during pregnancy (63.5%) has improved significantly: 22.7%, 32.6%, 44.7% (p<0.001). Pregnancies with non-available viral load before birth (14.9%) decrease: 67.7%, 19.4%, 12.9%; aswell the number of births been considered of high risk (36,5%): 44.7%, 30.3%, 25%. During this period, four children were infected: 2 before 2004, 2 after 2008.

Conclusions

The number of NB-HIV mantains stable, despite mother´s profile has changed because migration and less drug abuse. We have seen an improvement in the prophylactic measures that leads to less high risk NB-HIV.

ESPID-0442

IMPROVING DIAGNOSIS AND MANAGEMENT OF STREPTOCOCCAL TONSILLITIS/PHARYNGITIS IN THE EMERGENCY DEPARTMENT: EDUCATION ALONE IS NOT ENOUGH

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Background: Clinical diagnosis of Group A *Streptococcus* (GAS) tonsillitis/pharyngitis is notoriously difficult, frequently resulting in inappropriate antibiotic prescribing. Audit of a tertiary paediatric hospital emergency department (ED) in September 2012 demonstrated throat cultures were obtained in only 5% and antibiotics were prescribed in 65% of children with suspected tonsillitis/pharyngitis. After in-service education the practice was re-audited.

Methods: In September 2013, electronic medical and microbiological data of children attending the ED with tonsillitis/pharyngitis were reviewed using a standard data collection sheet.

Results: 101 patients were diagnosed with tonsillitis/pharyngitis. Throat cultures were performed in 64% (a 12-fold increase). 27% were already on antibiotics from GP on arrival (versus 26% in 2012). Antibiotics were prescribed by ED in 65% of children with tonsillitis/pharyngitis (unchanged). Antibiotics were prescribed for 18 of 29(62%) untreated children without performing throat cultures. Throat cultures were performed and antibiotics prescribed in 30 children, and 22(73%) were continued on antibiotics despite receipt of negative throat cultures. 3 of 5 untreated children with positive throat cultures were later prescribed antibiotics; 2 were lost to follow-up. ED prescribed antibiotics in 41 of 43 (95%) children with tonsillar exudates compared to 27 of 58 (46%) without.

Conclusions: In the paediatric ED, antibiotic prescription rates for tonsillitis/pharyngitis remain unacceptably high and overly reliant on nonspecific clinical signs. While more throat cultures were performed following education, microbiology results were largely ignored. Point-of-care testing and/or clinical scoring systems should be introduced in addition to ongoing education to improve clinical practice.

ESPID-0443

REDUCED INCIDENCE OF OTITIS MEDIA AMONG CHILDREN IN GERMANY AFTER INTRODUCTION OF HIGHER-VALENT PNEUMOCOCCAL CONJUGATE VACCINES

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Background: Routine infant immunization with the pneumococcal conjugate vaccine PCV7 started in Germany in 2007. In 2009, two higher-valent PCVs were licensed (PCV10 and PCV13) and replaced PCV7. Aim of this study was to assess the potential impact of PCVs on otitis media (OM) in children in Germany, especially with regard to the higher-valent vaccines.

Methods: Data from IMS-Health-VIP® were used for uninterrupted time series analyses that used ICD-10 diagnosis rates as main outcome (H66=suppurative OM, H65=non suppurative OM). The pre-vaccine period 2003-2006 provided baseline values and was compared to the single years 2007 to 2012 characterized by a rapidly growing vaccination rate with 7-valent and higher-valent PCVs in children <2 years of age. Reduction rates (%) were adjusted to the size of the corresponding age cohorts; the Poisson model was used for statistical analysis.

Results: During the baseline period an average of 1,403,497/391,828 episodes of suppurative/non-suppurative OM occurred annually in children aged 0-4 years. Subsequently, episodes for suppurative/non-suppurative OM were found to be reduced significantly (p-value for all <0.0001): In 2009 by 15.2%/17,5%, and in 2012 by 31.9%/24,2% compared to baseline, respectively. Analyses among children aged 5-10 years showed similar trends. Within the 6 years from 2007 to 2012, altogether 3,684,330 less episodes of suppurative and non-suppurative OM were documented for all children 0-10 years.

Conclusion: A significant reduction in otitis media diagnoses among children in Germany after implementation of PCV7 was demonstrated. An additional reduction was observed with the introduction of higher-valent PCVs.

ESPID-0444

25-HYDROXYCHOLECALCIFEROL DEFICIENCY MAY CONTRIBUTE TO HEPATIC IMPAIRMENT IN HCV VERTICALLY INFECTED CHILDREN

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BACKGROUND AND AIMS

Recent studies have shown a possible correlation between 25-hydroxycholecalciferol (25-OH-D) deficiency and organ impairment caused by hepatitis C virus (HCV) horizontally-acquired during adult age. It has been hypothesized that 25-OH-D may play a role as anti-apoptotic and anti-fibrinogenic agent. The aim of this cross-sectional pilot study was to find out a possible similar correlation in HCV vertically-infected children.

METHODS

Serological 25-OH-D (ng/ml) levels were measured in HCV-vertically infected children followed at the Pediatric Department San Paolo Hospital in Milan-Italy; hepatic fibrosis stage was obtained evaluating hepatic stiffness by Fibroscan® and hepatic ultrasound. Bivariate statistical estimation was performed for the considered parameters.

RESULTS

Nine HCV vertically-infected patients were included in the study (aged between 3 and 26 years; 4 males). Low 25-OH-D levels (< 30 ng/ml) were detected in all patients. Stiffness values at Fibroscan® was < 6 Kpa in 6/9 patients (no fibrosis); 2 patients presented stiffness values of 6.4 and 9.6 Kpa; 1/9 presented stiffness value of 22.3 Kpa (advanced fibrosis). Hepatic ultrasound images fitted with stiffness values at Fibroscan®. In 6/9 patients the bivariate statistical estimation of Fibroscan® stiffness values and 25-OH-D serological levels showed a trend to inverse correlation between these two parameters: the higher the 25-OH-D value, the lower the stage of hepatic impairment (p= 0,5719).

CONCLUSIONS

Low 25-OH-D serological levels may represent a pro-fibrotic factor and it may contribute to organ impairment progression in HCV vertically-infected children. 25-OH-D diet supplementation may slow down organ impairment progression in this kind of patients.

ESPID-0445

RELATIONSHIP BETWEEN PROGNOSTIC PARAMETERS OF INVASIVE MENINGOCOCCAL DISEASE IN CHILDREN

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Aim

To analyse the relationship between six bad prognostic parameters of invasive meningococcal disease (IMD) in children. Clinical data of children with IMD admitted to the Paediatric intensive care unit (PICU) of Children's Hospital, Vilnius University Hospital Santariskiu Klinikos (Vilnius, Lithuania) were analysed.

Methods

In total 74 patients with bacteriologically and/or clinically confirmed IMD (2009-2012 period) were included into the study. BPP counted: 1) duration of illness (< 12 hours); 2) widespread haemorrhagic rash; 3) septic shock; 4) alerted consciousness/coma; 5) blood leukocyte count $<10x10^9$/L; 6) blood platelet count $<100x10^9$/L. Paediatric Index of Mortality 2 (PIM2) was calculated according to specific formula. BEP score was calculated with formula presented in 2013.

Results

Children with meningococcal septicemia (46(63%)) arrived to the hospital in worse condition than those with meningococcemia with meningitis (28(37%)). We revealed significant difference between PIM2 index and BEP score in two forms of IMD - PIM2 and BEP in MS group are significantly greater than in MM (average PIM2 for MS was 12.5%, for MM - 4.71%, $p<0.03$; average BEP for MS - 0.13, for MM - 0.02, $p<0.04$). BPP had medium correlation with outcomes in total and MS groups ($R=0.6$ for total, $R=0.7$ for MS, $p<0.0001$). PIM2 and BEP correlated strongly with outcomes in all groups ($p<0.001$).

Conclusions

BPP might be useful prognostic tool of in early stages of severe forms of MS, it reliably correlates with PIM2 and BEP. BPP, BEP and PIM2 help to predict the course of the disease and the prognosis.

ESPID-0447

REDUCED INCIDENCE OF PNEUMONIA AMONG CHILDREN IN GERMANY AFTER INTRODUCTION OF HIGHER-VALENT PNEUMOCOCCAL CONJUGATE VACCINES

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Background: After implementation of routine infant immunization with pneumococcal conjugate vaccine PCV7 in Germany in 2007, two higher-valent PCVs were licensed in 2009 (PCV10, PCV13) and replaced PCV7. Aim of this study was to assess the potential impact of PCVs on pneumonia in children in Germany.

Methods: Data from IMS-Health-VIP® were used for uninterrupted time series analyses using ICD-10 diagnosis rates as main outcomes (J18=pneumonia; including sub-diagnosis J18.1=lobar pneumonia, frequently caused by pneumococci). The pre-vaccine period 2003-2006 provided baseline values and was compared to the single years 2007 to 2012 characterized by rapidly growing vaccination rates with 7-valent and higher-valent PCVs in children aged <2 years. Reduction rates (%) were adjusted to the size of the corresponding age cohorts; the Poisson model was used for statistical analysis.

Results: Episodes of pneumonia initially (in 2008) decreased in children aged 0-4 years and re-increased until 2011. In 2012, a significant reduction of 22.8% ($p<0.0001$) compared to baseline was observed. Of particular interest, episodes of lobar pneumonia decreased by 87.6% in 2008. Until 2011, a temporarily increase was also observed for episodes of lobar pneumonia, followed by a re-decrease in 2012 with a significant reduction of 55.5% ($p<0.0001$) compared to baseline. Analysis among children aged 5-10 years showed similar trends. Within the six years from 2007 to 2012, altogether 447.476 less episodes of pneumonia were documented for all children 0-10 years.

Conclusion: After introduction of higher-valent PCVs a consolidated and significant reduction in pneumonia diagnoses among children in Germany was demonstrated.

ESPID-0448

WHY THE BACTERIA OF THE ORDER BURKHOLDERIALES ARE THE MOST DANGEROUS TO THE CYSTIC FIBROSIS PATIENTS IN THE RUSSIAN FEDERATION

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Background and aims. Cystic fibrosis (CF) is orphan disease, complex treatment of which can prolong life of patients. But microorganisms, provoking respiratory insufficiency, cancel out success of therapy. As we demonstrated earlier *Burkholderia cenocepacia* ST709 had most epidemiological significance for Russian CF patients. The aim of this research was the clarification of cause of wide spread of this genotype.

Methods. MLST protocol (Spilker T. et al.) for Bcc strains genotyping, software packages SplitsTree, BURST, PHYLIP, MEGA 5, BioNumerics V. 7.0 for data analysis, real time PCR for express detection of *Burkholderia cepacia* complex (Bcc).

Results. Analyzing of enlarged sampling of biological specimens from CF patients (sputum, laryngo-tracheal aspirate and/or bacterial strains) demonstrated that not only Bcc, but different bacteria of Burkholderiales order were often detected in young patients. 73,1% of analyzed patients had bacteria of Burkholderiales order in quantifiable amount: 56,7% - Bcc, 15,8% - *Achromobacter xylosoxidans*, in one case - *Pandoraea pnomenusa*. 79% of all Bcc were the strains of ST709, and they were the cause of high mortality. *A. xylosoxidans* was represented by 11 *glt* gene alleles, more frequently by allele 1 (33,3%) and 2 (25,9%). And allele 2 had nosocomial significance.

Because antigen determinants are closely related at all members of Burkholderiales we examined the vaccination carts of CF patients and revealed the exclusion of pertussis cellular component from complex DTP vaccine.

Conclusions. Exclusion of pertussis cellular component from complex DTP vaccine is one of the causes of wide spread of bacteria of Burkholderiales order among young CF patients.

ESPID-0449

DETECTION OF HUMAN CORONAVIRUSES IN STOOL AND NASAL SWAB SAMPLES OF CHILDREN WITH ACUTE GASTROENTERITIS AND ACUTE RESPIRATORY TRACT INFECTION

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Background and aims Human coronaviruses (HCoVs) OC43, 229E, NL63 and HKU1 are common causes of respiratory infections. Over the years, a possible role of HCoVs in gastrointestinal infections has been proposed. We assessed this role by studying 172 children with acute gastroenteritis (AGE), 545 with acute respiratory tract infection (ARTI) and 238 with symptoms of both.

Methods Study was conducted in Tampere University Hospital during two years. Both stool and nasal swab (NS) samples of all 955 children were studied by PCR.

Results HCoVs were detected in 52 (5.4%) children. In 17 children HCoVs were detected simultaneously in stool and NS samples, in 33 children only in NSs and in two children only in stools. HCoV-OC43, HCoV-HKU1, HCoV-229E and HCoV-NL63 were encountered in 14 (1.5%), 11 (1.2%), 12 (1.3%) and 15 (1.6%) cases, respectively. Overall, HCoVs were found equally in patients with AGE (5.8%), ARTI (4.4%) and symptoms of both (7.6%).

HCoVs were detected in stools of seven children (4.1%) with AGE, in six of these cases also the NS sample was positive for HCoV, and additionally in six cases the stool sample contained rotavirus or calicivirus.

Conclusions HCoVs were found in the stools of children with AGE, but the most samples harbored rotavirus or calicivirus, which may have caused the symptoms. Whether the HCoV findings in stool are results of swallowing of respiratory secretions, or true replication of the virus in gastrointestinal tract cannot be concluded. However, it seems unlikely that HCoVs have a significant role in childhood AGE.

ESPID-0450

FILMARRAY BC-ID PANEL FOR IDENTIFICATION OF ORGANISMS FROM POSITIVE BLOOD CULTURES IN A UNITED KINGDOM PAEDIATRIC SPECIALIST HOSPITAL.

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Background: FilmArray is a cartridge based FDA-approved multiplex PCR assay for identification of certain organisms direct from positive blood culture bottles in approximately 90 minutes.

Aim: To audit the performance of FilmArray BC-ID panel over a four month period (September-December 2013) for identification of organisms from positive paediatric blood cultures in Alder Hey Hospital's clinical microbiology laboratory.

Methods: The samples were processed in line with manufacturer's instructions on the BacT/Alert automated blood culture monitoring machine. Once the sample flagged positive and the consultant microbiologist felt a rapid result would impact on patient management a FilmArray test was performed. No funding was received for the consumables in this project from the manufacturers.

Results: 57 samples were included in this study. 51 (89%) samples had organisms which were included in the FilmArray BC-ID panel. 50 (98%) of these 51 samples had agreement between the routine culture and FilmArray result; Coagulase negative Staphylococci =24, *E.coli* =3, *S. aureus* =3, *Streptococcus spp*.=3, *Klebsiella oxytoca* =2, *N. meningitidis* =2, *Acinetobacter sp.*=1, *Candida tropicalis* =1, *Candia parapsillosis* =1, Group B Streptococcus =1, *H.influenzae* =1, *Klebsiella pneumoniae* =1, *Serratia sp.* =1, Mixed =6. The one incorrect result was a technical failure as it was correct on repeat. The 6 culture growths not included in the panel were all deemed clinically to be contaminants.

Conclusion: The FilmArray BC-ID reliably (98% accuracy) offers the potential to identify certain organisms in blood cultures within 90 minutes, with approximately 90% coverage of positive blood cultures from a paediatric hospital.

ESPID-0452

MOLECULAR METHODS DETECTING MULTIPLE RESPIRATORY VIRUSES TO ESTABLISH THE ETIOLOGY OF FEVER IN INFANTS < 3 MONTHS

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Background and aims

In infants <3 months, clinical evaluation and usual diagnostic techniques allow to establish the etiology of febrile episodes in about half of the cases. We evaluated the possible diagnostic contribution of molecular methods detecting viruses on respiratory secretions in this situation.

Methods

From November 2010 to May 2011, all febrile infants < 90 days admitted to the emergency department were enrolled. Clinical, biological and microbiological data were recorded. Standard viral diagnostic procedure on nasopharyngeal aspirates consisted in rapid antigenic detection tests of 3 viruses (Influenza A and B, and/or hMPV, RSV, Parainfluenza, Adenovirus, according to the season), and viral culture. Additionally, molecular methods (CLART® Pneumovir DNA array (Genomica) and 16 home-made real-time PCR's) were conducted on nasopharyngeal aspirates when rapid tests were negative.

Results

208 febrile episodes occurred in 201 infants, 84% of the episodes led to hospitalization and 42% to intravenous antibiotherapy. Using standard diagnostic techniques, the rate of documented microbiological etiology was 13% at emergency department discharge, 47% during hospitalization and 64% when viral cultures results became available. Molecular methods increased the microbiologically documented etiology rate by 10%, to a total of 73% of the episodes. In the subgroup of infants without clinical source of infection, molecular methods increased the rate of microbiological documentation by 18%, from 50% to 68%.

Conclusions

Molecular methods detecting respiratory viruses notably increased the proportion of febrile infants with documented etiology. Making their results rapidly available could help identifying the infants whose management could be lighten.

ESPID-0453

IMPACT OF VACCINATION ON THE COURSE OF RECURRENT LARYNGEAL PAPILLOMATOSIS - CASE REPORT

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We present a case report of one year old girl with recurrent laryngeal papillomatosis that was successfully treated by vaccination. The childs mother got condyloma acuminata during pregnancy. The disease was transmitted to the girl probably during delivery. At age of 5 months, the child started to present difficulties with breathing due to laryngeal papilomas. The disease required frequent papilectomies (almost every month) to maintain breathing. The papilomavirus type 11 was detected by PCR in the papiloma histology sample. At age of 18 months we started experimental vaccination with Gardasil* (it contains particles similar to HPV 6, 11, 16, 18). Intervals between necessary papilectomies were longer after the second dose of the vaccine. There was no need for further polypectomy after the third dose of the vaccine. At age of 30 months the child has no clinical and laryngoscope signs of laryngeal papillomatosis and the girl regained her voice. This case indicates possible new therapeutical approach to recurrent laryngeal papillomatosis.

*Gardasil, Merck, New Jersey, USA, regional brand name Silgard in the Czech Republic

ESPID-0454

CHRYSEOMONAS LUTEOLA BACTEREMIA IN PEDIATRIC PATIENTS

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Background and aims: *Chryseomonas luteola* is a rare pathogen in humans. There were a few case reports about infections that were caused by *C. luteola*. In this study, we investigated the clinical characteristics, antibiotics susceptibilities, treatment regimens and outcomes of seven pediatric patients with *C. luteola* bacteremia.

Methods: We performed a retrospective review at Dr Sami Ulus Maternity, Children's Health and Disease Research and Education Hospital which is 382 –bed tertiary care center in Central Anatolia. From January 2005 to November 2013, all patients aged between 1 month and 18 years with *C. luteola* bacteremia were included in this study

Results: During the 9-year study period, seven patients were diagnosed with *C. luteola* bacteremia, including two boys and five girls. The mean age of the patients was 44±40.8 months (median 24 months, range 11-105 months). Six patients had hospital-acquired bacteremia. The mean interval from hospitalization to the development of bacteremia was median 13 days. There was only one community acquired *C.luteola* infection in this series. All patients had monomicrobial bacteremia without any concomitant microorganism.

Conclusions: *C.luteola could cause both community and hospital acquired bacteremia. H*ospital-acquired *C.luteola* infection was associated with underlying chronic diseases, longer hospital stay, presence of central vascular catheter, administration of total parenteral nutrition and mechanic ventilation. A*mikacin, gentamicin, trimethoprim/*sulfamethoxazole and meropenem were effective against *C.luteola in our hospital.* There may be p*iperacillin/tazobactam,* aztreonam, ceftazidim *and colistin resistance among C.luteola strains. Empirical treatment of nosocomial infections including C.luteola with a carbapenem antibiotic is suitable for our hospital.*

ESPID-0455

IMPACT OF A MULTI-DISCIPLINARY ASSESSMENT AND INTERVENTION PROTOCOL ON MRI SCAN DURATION AND TIMING OF OPERATIVE TREATMENT FOR CHILDREN WITH MUSCULOSKELETAL INFECTION

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Background and Aims: Magnetic resonance imaging (MRI) may be inefficiently utilized to assess Children with musculoskeletal infection (MSI). This study evaluates the impact of a multi-disciplinary MRI protocol on scan time and operative intervention.

Methods: By protocol, children with possible MSI were evaluated by the orthopedic attending who communicated directly with the attending pediatrician, radiologist, anesthesiologist, MRI technician, and operating room team prior to imaging. The same team reviewed images during the scan to decide if surgery was indicated. MRI scan duration and operative procedures performed following MRI were prospectively tracked and compared with that of an historic cohort of children who were treated prior to this initiative.

Results: Average scan time under the protocol was 1 hour 16 minutes for 214 MRIs which confirmed MSI in 152 children. On average 2.5 body areas were imaged per child using 7.4 sequences. Of 111 surgeries, 76 (68.5%) were done on the same day and 56 (50.5%) were accomplished under the same anesthesia as the MRI. In comparison, prior to protocol the average scan was 1 hour 51 minutes, with 3.4 body areas imaged using 9.0 sequences. Of 96 surgeries, 43 (44.8%) were on the same day and 16 (16.7%) under the same anesthesia as the MRI. All differences between cohorts were significant ($p<0.0001$). Institutionally, 125 hours of MRI scan time were conserved and average LOS was 2 days shorter.

Conclusions: This protocol for MRI planning and review resulted in significantly shorter scans and more efficient operative intervention for children with MSI.

ESPID-0460

THE NHS ENGLAND SECONDARY CARE COST BURDEN ASSOCIATED WITH THE 2012 PERTUSSIS OUTBREAK

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Introduction: The 2012 UK pertussis epidemic saw the highest number of reported cases since the 1990s.
Objectives/aims: This study aimed to quantify the 2012 pertussis-related secondary care cost burden in England and compare this to previous years.

Methods: Secondary care admissions for patients with pertussis were analysed from March 2006-February 2013 using Hospital Episode Statistics data and associated International Classification of Diseases (10th revision) codes. Pertussis-related costs were calculated for each patient using the Healthcare Resource Group tariff assigned to each pertussis admission, any previous admissions within that study year and any subsequent admissions within a 6 month period. The comparative cost burden was determined by analysing results versus age-matched controls.

Results: In 2012-13, 934 patients were admitted to hospital with pertussis, compared with 424 in 2011-12 and 421 in 2008-09, the last peak year. Mean per patient cost burden remained fairly consistent between 2006-2013. A higher number of pertussis patients admitted during 2012 resulted in an increased annual secondary care cost burden.

	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
Number of admitted patients	269	305	421	270	183	424	934
Mean per patient cost burden (£)	1891	2705	2488	2188	2298	2890	2357
SEM per patient cost burden (£)	215	302	227	411	347	365	160
Annual cost burden (£)	508730	825131	1047537	590653	420524	1225312	2201773

Patients under 1 year of age accounted for 85% of pertussis-related secondary care costs. A significantly higher proportion of pertussis patients had low birth weight versus matched controls.

Conclusions: The 2012 pertussis outbreak led to increased secondary care costs in England – double the previous peak year. These results highlight the importance of maintaining high coverage rates within an optimal vaccination schedule.

ESPID-0461

SUSCEPTIBILITY TO MEASLES, MUMPS AND RUBELLA AT 5 YEARS AGE IN BELGIUM

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Background/ aims

Offering 2 measles-mumps-rubella (MMR) vaccines with a short interval soon reduces the number of susceptibles to measles and mumps. With a later second dose, e.g. at the age of 10-13 years as in Belgium, better long term protection was proven for rubella only. In view of current outbreaks, susceptibility is analyzed for measles and mumps before administration of a late second dose.

Methods

Blood was taken (5cc) from 5 year old children and a questionnaire was filled on general health conditions, vaccination data and past/ current illness. Immunoglobulin G (IgG) antibodies against MMR were measured with ELISA (Siemens®).

Results

We included 144 children, 45% boys and 55% girls. Timeliness of the first MMR dose vaccination was well respected: 70.4% received MMR1 between 12 and 13 months, and 94.4% before 14 months of age. Table summarizes geometric mean titers (GMT) and seropositive, equivocal and seronegative results. No influence was found from several variables on the IgG titer for either antigen, except that gender (girl) had a significantly positive influence on the rubella IgG titer (p=0.01).

Conclusions

At the age of 5 years and after 1 MMR dose at 12 months of age, rubella immunity is intact but measles antibody titers are seronegative in 13,2%. Validation of the high mumps seronegativity is planned.

	Measles	**Rubella**	**Mumps**
GMT (95%CI)	660 mIU/mL (± 305)	21 mIU/mL (± 3)	296 antibody titer (± 175)
N Positive samples(%)	102 (70.8%)	136 (94.4%)	46 (31.9%)
N Equivocal samples(%)	23 (16%)	6 (4%)	34 (24%)
N Negative samples(%)	19 (13%)	2 (1.4%)	64 (44%)

ESPID-0462

TUBERCULOSIS (TB) CO-INFECTION IN HIV-INFECTED CHILDREN IN THE UK & IRELAND

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Background: In 2012, overall TB incidence in the general paediatric population of the UK was ~4/100,000, with highest rates among black (153/100,000) and south Asian (337/100,000) ethnic groups. TB incidence in HIV-infected children ranges from 150-609/100,000 person years (py) in low, and 5200-23400/100,000py in high TB prevalence countries. We assessed incidence of TB co-infection in the UK/Ireland Collaborative HIV Paediatric Study (CHIPS).
Method: TB incidence (TB-related CDC B/C events, hospital admissions and deaths) and associated risk factors (baseline and time-updated) were estimated by Poisson regression.
Results: Of 1,843 HIV-infected children in CHIPS in 1996-2013, 56% were born abroad and 91% had non-white ethnicity. 77 children had a TB event, 28 (36%) at presentation and 49 (64%) after entry (median 14.9 months later, IQR 1.2-53.2). Median age at TB onset was 9.3 years (IQR 5.3-12.8); 43(56%) events were pulmonary TB and 34 (44%) extra-pulmonary, including 9 tuberculous meningitis. Overall TB incidence was 505/100,000py (Table 1). Rates were higher in children presenting with AIDS, born abroad, antiretroviral naïve, aged <5 years, of black African ethnicity, and earlier calendar year of follow-up (Table 1, 2).
Conclusion: TB incidence in this cohort was comparable to HIV-infected children in other low TB prevalence countries, but considerably higher than the general UK paediatric population. The high proportion of non-white ethnic groups in this cohort, with higher background risk of TB, is a likely contributor.

Table 1. TB incidence in HIV-infected children: baseline characteristics

		No events/py	Rate per 100,000py (95%CI)
Overall		**77/15,257**	**505 (404-631)**
Place of birth	UK/Ireland	16/8,449	189 (116-309)
	Abroad/Unknown	61/6,807	896 (697-1,152)
Ethnicity	White	0/1,895	-
	Black African	69/11,172	618 (488-782)
	Other	8/2,188	366 (183-731)
Presentation	From birth	6/2,177	276 (124-613)
	Pre-AIDS	42/11,423	368 (272-498)
	AIDS	29/1,656	1751 (1,216-2,519)

Table 2. Rates of TB by key risk factors, time-updated variables

		No events/py	Rate per 100,000py (95%CI)
Treatment status	Before ART	55/4,954	1,110 (852-1,446)
	After start of ART	22/10,302	214 (141-324)
Age group	<5 years	19/243	7,813 (4984-12,249)
	≥5 years	58/15,013	386 (299-500)
Calendar year	<2003	27/4,521	597 (410-871)
	2003-2006	26/3,968	655 (446-962)
	2007-2009	16/3,477	460 (282-751)
	2010-2013	8/3,290	243 (122-486)

ESPID-0463

RENAL SCARS ON 99M- TC DMSA SCINTIGRAPHY IN CHILDREN WITH URINARY TRACT INFECTION- BACTERIOLOGICAL PROFILE AND ANTIBIOGRAM

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RENAL SCARS ON 99m- Tc DMSA SCINTIGRAPHY IN CHILDREN WITH URINARY TRACT INFECTION- BACTERIOLOGICAL PROFILE AND ANTIBIOGRAM

Introduction: Urinary tract infection (UTI) is one of the most common bacterial infections seen in children. In up to 40% of cases of UTI, renal scar develops which may occasionally lead to chronic renal insufficiency.

Objective: To study the incidence of renal scars in children with UTI, their bacteriological profile and antibiogram.

Methodology: This is a prospective study of children below 10 year of age, with culture proven UTI between August 2009 to December 2013 at Manipal Hospital, Bangalore, India. DMSA scan was done on the first and subsequent episodes of UTI for the evidence of scarring.

Results: Total 1121 children had culture positive UTI, of which 350 (31.2%) children had renal scarring on Tc 99m-DMSA scintigraphy. Out of 350 children, 86 (24.6%) had renal scarring after the first episode and 147(42%) developed after recurrent UTI. E-coli was the most frequently isolated urinary pathogen seen in 230(65.7%), followed by Klebsiella.pneumoniae 87(24.8%), Proteus mirabilis 22(6.3%) and Enterococcus 6(1.7%).The incidence of scarring after the first and recurrent episodes of UTI with E-coli was 22.2%(51) and 77.8% (179), with Klebsiella 33.3%(29) and 66.6 % (58)respectively. E.Coli was most sensitive to cotrimoxazole(94%), followed by cephalosporin(82%), nitrofurantoin(71%)and ampicillin(48%). Klebsilla.pneumoniae was most sensitive to cephalosporin(81%), followed by cotrimoxazole(80%), nirtofurantoin(46%) and ampicillin(30%).

Conclusion: Nearly one third of children with UTI had renal scarring and incidence increased with recurrent episodes. Though E-coli was the commonest organism, UTI caused by klebsiella .pneumoniae was more associated with renal scars in first episode, and showed higher resistance to antibiotics.

ESPID-0464

INFANT FEBRILE ILNESS: SEARCH FOR THE RESPONSIBLE MICROORGANISMS BY DIFFERENT MOLECULAR TECHNIQUES

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Background and aims: To gain insight in the role of respiratory viruses and atypical bacteria as etiologic agents of febrile episodes in infants (0 - 3 months) based on comparing conventional with molecular techniques.

Methods: 51 nasopharyngeal samples were collected from (7.8% prematurely delivered) febrile infants (median age 59 days) admitted to CHU St.Pierre, Brussels, December 2010 - April 2011. Conventional virology was performed; additionally all samples were analyzed by 2 commercial molecular methods (CLART® Pneumovir (Genomica); Smartfinder®(Pathofinder)); by 16 home-made viral PCR's and by Taqman Array Card (TAC)- detecting simultaneously 18 viruses, 9 atypical bacteria, 1 fungus.

Results: The diagnostic gain from culture to molecular diagnosis was considerable. Viral culture detected 23 (45%) and Ag-detection 11 (22%) mono-infections while molecular methods found 33 (75%) to 46 (90%) positive samples. Significant differences between molecular techniques were observed: 26 to 34 mono-infections; detected viruses: 39 – 67; absence of correlation for adenovirus detection

Rhinoviruses were present in 1/3th of the samples. 3 infants were infected by Paraechoviruses. CMV was detected in 4 samples as co-pathogen. No atypical bacteria were found. Five samples were *Pneumocystis* positive, one as mono-infection.

Conclusions: In comparison to molecular methods, viral culture and Ag-detection are suboptimal techniques. Smartfinder correlates better than Pneumovir with home-made TAC. Smartfinder doesn't differentiate between entero-/rhinoviruses, while Pneumovir can't detect non-229E coronaviruses.

Paraechoviruses (important cause of neonatal sepsis/meningitis) should be routinely included in infectious screening in infants <90 days old. Primary *Pneumocystis* infection shortly after birth may present as a mild upper respiratory infection.

ESPID-0465

WORK PRODUCTIVITY AND ACTIVITY IMPAIRMENT IN CAREGIVERS OF CHILDREN HOSPITALIZED FOR RESPIRATORY ILLNESS (WPAI: CHRI) – RESULTS FROM CANADA, GERMANY, SLOVENIA, GREECE, TAIWAN AND KOREA

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Introduction This study reports the results of the Work Productivity Activity Impairment Questionnaire in caregivers of children hospitalized with a respiratory illness (WPAI:CHRI) in six countries.

Methods The Parent Burden Study was a prospective multinational study designed to determine the humanistic and economic burden of infant (<1 year of age) LRTI hospitalizations. Data was collected from six countries (Canada, Germany, Slovenia, Greece, Taiwan and Korea) between 2010 and 2012. Parents were asked to complete a survey at the time their infant was discharged from hospital. The survey included the disease specific WPAI:CHRI in order to measure lost work productivity. The WPAI:CHRI questionnaire measures work absenteeism, work presenteeism (impaired productivity while at work), overall work productivity loss, and daily activity impairment experienced in the past 7 days.

Results 225 fathers and 321 mothers of 323 hospitalized infants completed the survey. 84% of fathers reported that they were currently employed. Of working fathers, mean lost productivity reported: absenteeism 28.81%; presenteeism 55.11%, and overall work impairment 64.47%. 14.7% of mothers reported they were currently employed. Of working mothers, mean lost productivity reported: absenteeism

53.51%, presenteeism 57.07% and overall work impairment 82.11%. For all parents mean 65.16% and 85.35% impaired daily activity was reported for fathers and mothers respectively.

Conclusion This study highlights the global impact that infant LRTI hospitalizations can have on work productivity experienced by parents and caregivers. These findings contribute to a better understanding of the overall economic impact of infant LRTI hospitalizations.

ESPID-0466

INFLUENZA (IF) VACCINE EFFECTIVENESS IN PREVENTING HOSPITALIZATION IN CHILDREN BETWEEN 6-24 MONTHS: CASE-CONTROL MULTICENTER STUDY

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Background and aims: Respiratory viruses infections are a public health problem and IF is the only vaccine preventable disease. No effectiveness studies were performed so far in Argentina in pediatrics. The aim of the study was to determine the effectiveness of IF vaccine to reduce the hospitalization risks in 6-24 months children.

Methods: Case-control study, matched by age (6-11, 12-17 and 18-23months) performed in three pediatric hospitals. Cases: children between 6-24 months of age hospitalized with ALRI IF diagnosis. Controls: non ALRI 6-24 months children admitted in the same period of time. Effectiveness(EF)=(1-OR)x100. Nominal logistic regression was performed to adjust EF by age group and cronic pulmonary disease (CRD).

Results: The study included 131 patients:

Variables	Cases (n=38)	Controls (n=92)
Age (mean, SD)	12 months;4.7	13 months;4.9
Gender (male)	55.2%(21/38)	51.9%(47/92)
Procedence (Buenos Aires)	82.5%(34/38)	86.9% (80/92)
Overcrowding	48.6% (17/38)	64.8%(59/91)
IF Schedule vaccination: 1st dose 2nd dose	 26.3%(10/38) 5.2%(2/38)	 53.2%(49/92) 22.8%(21/92)
Congenital Heart disease	10.5%(4/38)	1%(1/92)
Undernourishment	7.9%(3/38)	5.4%(5/92)
CRD	39.5%(15/38)	2.2%(2/92)
Immunodeficiency	2.7%(1/38)	3.3%(3/92)
Neurological disease	7.9%(3/38)	5.4%(5/92)
Prematurity	21.1%(8/38)	5.4%(5/92)

One dose crude effectiveness was 69% (29-87) p= 0.005, EF adjusted for age: 6- 11 months 83 % (41-95) p=0.005, not significant for the other groups. In CRD patients the effectiveness was 73 % (27-99) p=0.010 and non CRD was 67% (9-88) p= 0.033.

Conclusions: Cases presented more comorbidity in relation to controls. High proportion of inadequate schedules, 75 % of cases had not received any dose. The effectiveness is similar to other international publications.

ESPID-0467

TUBERCULOSIS IN PATIENTS WITH PREVIOUSLY DIAGNOSED HEPATOPATHY

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Background and aims: Tuberculosis treatment with first line drugs may have to be modified in case of previously diagnosed hepatopathy. We aim to analyse the treatment administered to patients with hepatopathy and its' complications.

Methods: We performed a retrospective descriptive study from January 2010 to December 2013 in a tertiary paediatric hospital of the patients diagnosed of tuberculosis and hepatopathy. We analysed the clinical presentation, characteristics and duration of treatment and outcome.

Results: We diagnosed 33 patients with tuberculosis. Five (15%) presented hepatopathy: 3 suffered from Alagille`s Syndrome (1 with a liver transplant), 1 had acute hepatitis B and another presented with acute liver failure while taking etambuthol and pirazinamide as prophylaxis for multiresistant tuberculosis. 3 patients were treated for pulmonary tuberculosis and 2 for milliary tuberculosis. We initiated classical treatment with 4 drugs in one case of milliary tuberculosis with stable hypertransaminasemia. The other 4 patients were initiated on alternative regimes without rifampicine. In the case of the acute liver failure we could start the classical treatment in a month after the normalization of the liver function. Two patients presented hepatotoxicity due to isoniacide and pyrazinamide, one ocular toxicity due to etambuthol and another thrombopenia due to linezolid. We treated for 9 to 18 months. All the patients had a favourable outcome.

Conclusions: Tuberculosis in patients with previously diagnosed hepatopathy is frequent in a tertiary paediatric hospital. In patients with hepatopathy we need to administer longer courses of treatment and there is a high probability of adverse effects.

ESPID-0469

PERSISTENCE OF BACTERICIDAL ANTIBODY FOLLOWING CURRENT MENINGOCOCCAL SEROGROUP C PRIMING AND BOOSTER VACCINATION SCHEDULES IN INFANTS AND TODDLERS

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Background and Aims: Persistence of serum bactericidal antibody (SBA) against serogroup C *Neisseria meningitidis* (MenC) in 24-month-old children was investigated in a randomised-controlled trial in the UK and Malta.

Methods: In the priming phase 509 infants were randomised to receive either one dose of MenC-CRM_{197} or MenC-TT when aged 3 months; or MenC-CRM_{197} when aged 3 and 4 months, or no MenC vaccination. All participants received the Hib-MenC-TT vaccine when aged 12 months followed by venepuncture 1 and 12 months later.

Results: One month after Hib-MenC-TT vaccination, MenC rSBA≥1:8 was measured in >96% of MenC glycoconjugate-primed participants and in 83% of MenC vaccine-naïve participants. Twelve months later 78% of those primed with MenC-TT had MenC rSBA≥1:8 but this had dropped to 42%, 25% and 15% of those primed with one, two MenC-CRM_{197} doses and naïve participants, respectively. Those primed

with MenC-TT had significantly higher (p=<0.00001) MenC rSBA geometric mean titres than those primed through any other vaccine/schedules (123.4 vs 6.17, 4.09 and 5.02 for one, two MenC-CRM_{197} doses and no dose priming respectively).

Conclusion: Infant priming with a single MenC glycoconjugate dose followed by a Hib-MenC-TT boost at 12 months results in more sustained seroprotection then two or no dose priming. Compared with those primed with MenC-CRM_{197}, more children primed and boosted with the MenC polysaccharide-tetanus toxoid conjugate have persistent MenC bactericidal antibody at 2 years of age.

ESPID-0470

POSTPRIMARY SERIES DTAP-IPV-HEP B-PRP-T VACCINE (HEXAXIM®) ANTIBODY PERSISTENCE, BOOSTER RESPONSE, AND SAFETY COMPARED TO LICENCED VACCINES IN COLUMBIA/COSTA RICA

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Background and aims: A new, fully liquid, hexavalent DTaP-IPV-HepB-PRP-T vaccine (Hexaxim®) was assessed for postprimary series antibody persistence and booster response in Colombian/Costa Rican infants.

Methods: Phase III, randomized, descriptive, multicentre study (NCT01444781). Infants primed at 2-4-6 months with Hexaxim or Infanrix hexa™ (Prevenar™ [PCV7] and Rotarix™ coadministration) received a Hexaxim or Infanrix hexa booster dose (PCV7 coadministration; see table for primary series/booster details) at 12-24 months of age. Hexaxim and Infanrix hexa booster immune response was assessed pre- and 1 month postbooster. PCV7 immune response was assessed; safety evaluated ≤1 month postbooster dose.

Results: Hexaxim and Infanrix hexa seroprotection/seroconversion rates (per-protocol):

	Group 1			Group 2			Group 3		
3-dose primary series / Booster dose (Per-protocol population)	Hexaxim / Hexaxim (N=396)			Hexaxim / Infanrix hexa (N=393)			Infanrix hexa / Hexaxim (N=260)		
	Po-Pr	Pr-B	Po-B	Po-Pr	Pr-B	Po-B	Po-Pr	Pr-B	Po-B
Anti-HepB ≥10 mIU/mL	99.5	97.5	99.7	99.7	97.7	99.5	100	99.2	100
Anti-PRP ≥0.15 µg/mL	94.1	73.4	99.7	95.7	77.7	100	94.6	76.4	100
Anti-Diphtheria ≥0.01 IU/mL	100	97.9	100	100	96.9	100	100	95.7	100
Anti-Tetanus ≥0.01 IU/mL	100	100	100	100	99.7	100	100	100	100
Anti-Polio 1 ≥8 (1/dil)	100	98.8	100	100	98.2	100	100	98.6	100
Anti-Polio 2 ≥8 (1/dil)	100	99.4	100	100	100	100	100	100	100
Anti-Polio 3 ≥8 (1/dil)	100	95.9	100	100	94.8	100	100	99.1	100
Anti-PT titer ≥4-fold increase EU/mL	NC	92.9*		NC	93.9*		NC	92.9*	
Anti-FHA titer ≥4-fold increase EU/mL	NC	87.5*		NC	88.8*		NC	93.3*	

Po-Pr=postprimary series; Pr-B=prebooster; Po-B=postbooster; NC=not calculated; *increase from prebooster

Hexaxim and Infanrix hexa prebooster seroprotection rates were generally high; postbooster seroprotection and seroconversion rates were high and similar in each group. For PCV7 components, 99.3%-100% reached the seroprotection threshold (0.35 µg/mL). All vaccines were well-tolerated; no vaccine-related SAE was reported.

Conclusions: A Hexaxim booster dose in the second year of life is highly safe and immunogenic after a Hexaxim or Infanrix hexa primary series. An Infanrix hexa booster dose is equally safe and immunogenic after a Hexaxim primary series. Study group response was similar after PCV7 booster coadministration; the expected PCV7 booster immune response was unaffected. This study shows Hexaxim or Infanrix hexa booster doses are exchangeable regardless of the primary series received. Funded by Sanofi Pasteur.

ESPID-0471

SEROTYPING AND ANTIMICROBIAL SUSCEPTIBILITY OF GROUP B STREPTOCOCCUS FROM INVASIVE NEONATAL SPECIMENS

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Background and aims

Group B *Streptococcus* (GBS) is a leading cause of neonatal sepsis.

To determine GBS serotype and antimicrobial susceptibility from invasive neonatal specimens.

Methods

Thirty-eight isolates of GBS were collected (34 blood cultures, three cerebrospinal fluid (CSF) and one post mortem sample) from 35 infants. Twenty-eight infants had early-onset disease (EOD) and seven had late-onset disease (LOD). Sex, gestation and outcome data were collected.

All isolates were subcultured twice onto Columbia blood agar and incubated overnight in CO_2 at 35°C. Following incubation, serotyping (Ia, Ib, II, III, IV, V, VI, VII and VIII), antimicrobial susceptibility testing using E-tests (penicillin, vancomycin, clindamycin, erythromycin, levofloxacin, tetracycline and trimethoprim-sulfamethoxazole) and D-tests for inducible clindamycin resistance by erythromycin were performed.

Results

Male and female infants were equally affected by invasive GBS infection. Serotype III was most frequently detected (16/35 or 45.7%), followed by serotype Ia (20%), V (11.4%), Ib (8.6%), II (8.6%) and IV (5.7%). The serotype distribution within EOD and LOD are compared. Serotypes VI, VII or VIII were not detected. Serotype V was associated with a high mortality (3 of 4 affected infants died).

All isolates were susceptible to penicillin, vancomycin, levofloxacin and trimethoprim-sulfamethoxazole. The majority of isolates were resistant to tetracycline (87.1%), five were resistant to erythromycin (12.8%), two resistant to clindamycin (5.1%) both were D-test negative.

Conclusions

Serotype III was the most commonly found in invasive neonatal infection, including EOD and LOD, sepsis and meningitis. Serotype V was associated with a high mortality.

ESPID-0472

TOLERABILITY OF EARLY MMR DURING A MEASLES OUTBREAK IN THE NETHERLANDS; PRELIMINARY DATA.

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Introduction, objectives, aims

Since May 2013, a measles outbreak is ongoing in the Netherlands. Up to January 8th 2014, 2562 cases were reported, mainly among unvaccinated children. Infants aged 6-14 months, living in municipalities with a Measles-Mumps-Rubella-vaccine (MMR) coverage <90% are eligible for early MMR-vaccination (MMR-0). We assess the tolerability of MMR-0.

Methods

Parents of eligible infants receive an invitation for MMR-0-vaccination. Four weeks later they are asked to participate in the study. After entry, they receive a questionnaire regarding demographics, vaccination status, possible measles symptoms and adverse events (AEs). Inclusion is ongoing. Frequency of AEs was compared with findings of a MMR-1-tolerability study, administered at the routine age of 14 months using risk ratios (RR).

Preliminary results

At January 8th 2014, 8793 infants received a MMR-0 invitation. Parents of 1505 infants (17%) were willing to participate in the study. 1042 Parents (69%) filled in the questionnaire, 804 (77.1%) infants received MMR-0.

Parents of 54 (6.7%) and 303 (37.7%) vaccinated infants reported local and systemic AEs, respectively. Redness was the most reported local reaction (91%), followed by pain (69%) and swelling (59%). Regarding systemic symptoms, listlessness (52%), fever (39%), crying (36%), rash (22%), sleeping problems (20%), diarrhoea (6%), paleness (4%) and vomiting (4%) were reported within the risk period of 5-12 days after vaccination.

RR for fever following MMR-0 compared to MMR-1 was 0.36 (95%CI 0.30-0.44).

Conclusion

MMR-0 vaccination is well tolerated. Lower frequency of fever is reported compared to a tolerability survey among Dutch children, vaccinated with MMR1.

ESPID-0473

EFFECTIVENESS OF EARLY MMR AGAINST CLINICAL MEASLES DURING AN OUTBREAK IN THE NETHERLANDS; PRELIMINARY DATA

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Introduction, objectives and aims

Since May 2013, a measles outbreak is ongoing in the Netherlands. Up to January 8th 2014, 2562 cases were reported, mainly among unvaccinated children. Infants aged 6-14 months, living in municipalities with a Measles-Mumps-Rubella-vaccine (MMR) coverage <90% are eligible for early MMR-vaccination (MMR-0). We assess its effectiveness (VE) against clinical measles (CM).

Methods

Parents of eligible infants receive an invitation for MMR-0-vaccination. Four weeks later they are asked to participate in the study. After entry, they receive a questionnaire regarding demographics, vaccination status, measles symptoms and adverse events. Inclusion is ongoing. CM is defined as rash, fever and at least one other symptom, i.e. coughing, red eyes, sore throat, runny nose. Self-reported vaccination history was used to calculate preliminary VE:

(Attack rate (AR) in unvaccinated – AR in vaccinated)/ AR in unvaccinated.

Preliminary results

By January 8th 2014, 8793 infants received a MMR-0 invitation. Parents of 1505 infants (17%) were willing to participate in the study. 1042 Parents (69%) filled in the questionnaire, 804 (77.1%) infants received MMR-0. Median age of MMR-0 was 7.9 months; median age of CM was 8.7m. Among unvaccinated, 33 infants (16.2%) reported CM. Among vaccinated, 40 infants (6.5%) reported CM. The preliminary VE estimate is 60% (95%CI 39- 74%).

Conclusion

Preliminary estimation of VE of MMR-0 against CM of 60% is lower than VEs assessed in previous studies. After data completion laboratory confirmation results, registered vaccination status and correction for potential confounders, will be used to verify this estimate.

ESPID-0474

IMPACT OF PNEUMOCOCCAL CONJUGATE VACCINES (PCV) ON TOTAL BURDEN OF COMMUNITY DIAGNOSES OF SERIOUS INFECTIONS (SI) IN UK PRIMARY CARE

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Background/Aims: Heptavalent PCV (PCV7) was introduced into the UK vaccination schedule in September 2006 followed by 13-valent PCV (PCV13) in April 2010. In the US and Europe PCV7 reduced the incidence of invasive pneumococcal disease in children aged <5 years. Hospital pneumonia admission rates in England declined by 19% in the 2-years post-PCV7-introduction. We assessed the impact of PCVs on primary care diagnoses of serious infections (SI) including pneumonia, empyema, meningitis, mastoiditis and septicaemia.

Methods: A descriptive cohort study was conducted using The Health Improvement Network database of anonymised patient records for 5% of the UK population. The population comprised children aged <16 years with ≥6 months' data and ≥1 SI diagnosis recorded between 1 January 2002 and 31 December 2012. The duration of a SI episode was defined as 30 days. Incidence of SI in the 2-year periods before and after introduction of the PCVs was calculated.

Results: SI incidence declined by 12.4% for children <16 years in the 2-year period post-PCV7-introduction (October 2006-September 2008) from 1.36 episodes/1000 person-years (PY) to 1.20/1000PY; the largest reductions were in younger children (16.3% in <2 years), and those with pneumonia (18.6% in <16 years, 20.9% in <2 years). SI incidence rose slightly pre-PCV13-introduction, but in the 2-year period post-PCV13 introduction the incidence of SI and pneumonia dropped by a further 9.2% and 14.9% in younger children.

Conclusions: PCVs have markedly reduced the incidence of overall SI diagnoses (particularly pneumonia); this is most evident in children <2 years.

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ESPID-0475

MILLER FISHER SYNDROME COMPLICATING AN EPSTEIN-BARR VIRUS (EBV) INFECTION

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Introduction : Miller Fisher syndrome (MFS) is a variant of Guillain-Barré Syndrome (GBS) with a typical triade : external ophtalmoplegy, ataxia, and hypo/areflexia. GBS as well as MFS is an Acute Inflammatory Demyelinating Polyradiculoneuropathy (AIDP) which occurs weeks after an bacterial or viral infection. C*ampylobacter jejuni, CMV, Mycoplasma pneumonia* or *influenzae virus* were the most reported infectious agents in MFS. MFS is extremely rare in children. We report here a MFS complicating an EBV infectious mononucleosis in an adolescent

Case report : A 14 year-old boy presented one week after an episode of 2-days fever, bilateral paresis of III, XI, XII, IX, X, XII cranial nerves, hyporeflexia without ataxia. There was no axonal or demyelinating signs in electroneuromyogram. However, cerebrospinal fluid analysis showed cytoalbuminological dissociation. MFS was confirmed by the presence of anti-GQ1b antibodies in blood sample. EBV serologies were positive as well as EBV PCR in blood. The patient was treated with 2g/kg IVIg and completely recovered in four months.

Discussion and Conclusion :

Pathophysiology of MFS is actually based on the « molecular mimic » concept. Causative infectious agents have epitopes on their surface that are similar to epitopes on the surface of peripheral nerves and can induce autoimmune injury. The presence of anti-ganglioside GQ1b is specific to MFS in 95% of cases. Our case showed that EBV can induce MFS in children and should be systematically searched in the lab investigations for causative agent assessment in GBS or MSF.

ESPID-0476

NOSOCOMIAL OUTBREAK OF COLONIZATION WITH STENOTROPHOMONAS MALTOPHILIA IN NEONATAL INTENSIVE CARE UNIT

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Background: Outbreak of nosocomial infection or colonization associated with nosocomial sources including contaminated water. Preterm infants, especially those admitted to neonatal intensive care units (NICU) may also have a risk of colonization, infection and outbreak.

Methods: Routine surveillance cultures of rectal swab were collected weekly in our NICU for infection control. We have detected and analyzed nosocomial outbreak of colonization with *Stenotrophomonas maltophilia.*

Results: During the routine surveillance, 6 rectal swab cultures were identified *S. maltophilia* from 15 neonates in the NICU. Similarly, environmental cultures were taken and *S. maltophilia* was isolated from carboy water, carboy pump and carboy tubes. REP-PCR (based on primers targeting the repetitive extragenic palindromic sequence) analysis showed that *S. maltophilia* isolates were not identical. Of the 6 neonates, 3 (%50) were females and 3 (%50) were males, with mean birth weight, gestational age, postnatal weight and postnatal age at outbreak of 1498 ± 455 (range, 1195-2390) gr, 31.4 ± 1.83 (range, 28-34) weeks, 1826 ± 562 (range, 1405-2850) gr and 19.33 ± 9.41 (range, 13-37) days, respectively.

Conclusion: Nosocomial outbreak with *S. maltophilia* may be related with contaminated environmental sources. It is important to collect surveillance cultures for detected outbreak and implementation of appropriate approaches for infection control in NICU.

ESPID-0477

PROCALCITONIN USE IN A PAEDIATRIC INTENSIVE CARE IN MANCHESTER

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Introduction: Procalcitonin (PCT) is an inflammatory marker raised in bacterial infection.

Objectives: Children in paediatric intensive care units (PICU) have multiple abnormalities of clinical and biochemical markers which are important to differentiate from bacterial infection.

Aims: The results and indications for the test were analysed.

Methods: Over a 12 month period, 102 procalcitonin assays were performed for children in a PICU in Manchester by consultant request.

Results: There were 32 results <0.5 ug/l at which sepsis is unlikely; 24 between 0.5 to 2 ug/l at which sepsis is possible but other conditions may induce PCT as well (e.g. major trauma, severe burns); 19 between 2 and 10 ug/l at which sepsis is likely; and 20 >10 ug/l most often due to severe bacterial sepsis.

Of the indications for procalcitonin testing 21 for fever, for example ‘temperature spike post cardiac surgery’, the majority (15) were <2 ug/l. “Sepsis” was the indication for 20: e.g. ‘sepsis on antibiotics road traffic accident’, but only 5 had a PCT >2 ug/l. The largest category (24 samples) are grouped as ‘ventilated’ with indications such as ‘ventilated adenoviral LRTI, CRP rising’, in which there are more with PCT between 2 – 10 ug/l than other result ranges. Other indications included ‘peritoneal dialysis neutrophilia on antibiotics’.

Conclusions: Procalcitonin has the potential to reduce antibiotic use in PICU within a structured framework of antibiotic governance. Further analysis is being performed to look for evidence of how patient management was changed because of the PCT result.

ESPID-0479

EPIDEMIOLOGIC CHARACTERISTICS OF ROTAVIRUS INFECTIONS OF A TERTIARY CARE HOSPITAL IN ANYANG, KOREA: (2006 THROUGH 2013)

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Introduction : Two new vaccines against rotavirus gastroenteritis were introduced in Korea in June 2007(RotaTeq) and March 2008(Rotarix).
Objectives : To determine the efficacy of these vaccines.
Aims : To find out the changes in rotavirus infections between pre-RV and post-RV vaccines.
Methods : Retrospective analysis of epidemiologic, virologic and clinical data from AGE-related hospitalization among children under 5 years during the 2006 and 2013 rotavirus seasons. A total of 7,724 diarrhea-related stool specimens were collected. The 1,261 stool specimens were positive results for rotavirus during the 8 years. Rotavirus was confirmed by PCR. We reviewed a retrospective cross-sectional study of all hospitalized rotavirus AGE childrens. The database for eligible age was under 5 years of age.
Results : The rotavirus positive hospitalized children were 250 patients in 2006 and 233(2007), 189(2008), 218(2009), 117(2010), 91(2011), 86(2012), 77(2013) respectively. The decline in case of hospitalization for rotavirus AGE were started from 2010. The onset was delayed from December(2006-2009) to January(2010-2013). The peak durations were shortened from 6 months(Dec-May) to 4 months(Jan-Apr), compare with the seasons(2006-2012) and post-RV(2013). The vaccine efficacy(n=118) was 83.7% during the 2012 and 2013.
Conclusions : We summarized the data of all patients with laboratory-confirmed rotavirus infections admitted at a university hospital during the period of 2006 thru 2013. The hospitalization rate for rotavirus AGE during pre-RV rotavirus seasons(2006-2009) compared with those during the post-RV seasons(2010-2013), was significantly declined. The onset was delayed and the peak duration was shorteded. The vaccine efficacy was 83.7%. Both vaccines able to decrease the rotavirus-induced severe AGE.

ESPID-0480

VANCOMYCIN-HETERORESISTANCE IN STAPHYLOCOCCUS EPIDERMIDIS COLONIZING NEONATES IN NEONATAL INTENSIVE CARE UNITS

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Background and aim: Vancomycin-heteroresistant staphylococci are susceptible to vancomycin by conventional MIC, but contain subpopulations capable of growing at vancomycin concentration ≥4 mg/L. We aimed to investigate prevalence of vancomycin-heteroresistance (VHR) and its contribution to clonal dissemination among *Staphylococcus epidermidis* (SE) colonizing newborns in neonatal intensive care units (NICUs).

Methods: SE isolates of different multilocus variable number of tandem repeats analysis (MLVA)-types from rectal swabs from neonates hospitalized to NICU-A and NICU-B within 72 h of life from August 2006 to November 2007 were studied. Vancomycin MIC was determined by broth-microdilution. VHR was screened twice on brain-heart infusion agar containing vancomycin (4 mg/L) using higher inoculum (10^8 cfu/mL) and longer incubation (48 h); growth in ≥1 experiment was considered VHR.

Results: Of 140 SE isolates (62 from NICU-A, 78 from NICU-B) collected from 107 neonates (54 in NICU-A, 53 in NICU-B) VHR was detected in 69 (49.3%), (1 of 6 isolates with vancomycin MIC 1 mg/L, 63 of 127 with MIC 2 mg/L, 5 of 7 with MIC 4 mg/L). Of overall 42 MLVA-types, 27 exhibited VHR. Four dominant clones comprised 60% of all isolates; of these isolates VHR was found in 30% to 56.5%, not significantly differing between NICUs. Of the isolates of the remaining sporadic clones, 51.8% exhibited VHR, proportion similar in both NICUs.

Conclusions: Our results imply that VHR does not contribute to clonal dissemination of SE in NICU. Considering the high prevalence and inability of conventional MIC to detect VHR further studies on VHR are warranted.

ESPID-0481

REDUCING ANTIBIOTIC TOLERANCE USING NITRIC OXIDE IN CYSTIC FIBROSIS: REPORT OF A PROOF OF CONCEPT CLINICAL TRIAL

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Introduction: Bacterial biofilms present a major challenge due to antimicrobial tolerance. In Cystic Fibrosis (CF), chronic *Pseudomonas aeruginosa* (PA) infection cannot be eradicated with conventional antibiotics, causing a faster decline in lung function and reduced survival.

PA biofilm dispersal (in *ex vivo* samples) is signalled by nanomolar concentrations of NO via cyclic-di-GMP leading to increased susceptibility of PA to antibiotics.

Aims and objectives: To investigate whether low dose NO enhances antibiotic therapy through disruption of PA bacteria in biofilms in patients with CF.

Method: We carried out a participant blind, placebo controlled, randomised clinical trial. (EudraCT 2010-023529-39).12 patients received standard IV antibiotics plus 7 days of NO gas or placebo for 8 hours/day during a pulmonary exacerbation. Primary outcome was microbiological quantification of PA using Fluorescent In Situ Hybridisation (FISH), Quantitative-Polymerase Chain Reaction (Q-PCR) and Colony Forming Units (CFUs). Clinical parameters were secondary outcomes.

Result: Generalised estimating equation analyses of FISH data demonstrated significant reduction in PA biofilm from day 0 to 7 [mean log difference between groups 3.49 (95%CI 0.32, 6.67; p=0.031) for >20 bacterial cell aggregates and 4.47 (95%CI -.04, 8.98; p=0.052) for biofilm volume]. Mean percentage predicted FEV_1 increased by 15.6% (95% CI -5.76-36.96) in the treatment group, compared to 6.67% (95% CI 1.99-11.3) for placebo.

Conclusion: These data show preliminary evidence of benefit using NO as adjunctive therapy with ceftazidime and tobramycin during a 7 day treatment. Novel targeted NO-donor antimicrobial therapies are being investigated that may enable long term biofilm control and reduced PA-related morbidity.

ESPID-0482

EVOLUTION OF THE VIH VERTICAL TRANSMISION AND PROPHYLAXIS IN A TERTIARY HOSPITAL IN SPAIN

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INTRODUCTION:

Until the years 1994-95 the risk of vertical transmision of VIH was around 18-35%; since then, the risk has been decreasing to be less than 1% nowadays.
This achievement was possible through measures such as the ACTG 076 protocol, a programmed caesarean, the use of highly active antirretroviral therapy (HAART) during the pregnancy and the prophylaxis with antirretrovirals in the newborn.

OBJETIVES:

Study the possibility of changes in vertical VIH transmission rate in consequence of the update of VIH prophylaxis protocol.

METHODS:

Case classification into three groups:

1.- 1986 y 1994: The only measure was the use of artificial milk formulas instead mother milk.

2.- 1995 y 2000: Establishment of ACTG 076 protocol (AZT during the gestation, delivery and newborn)

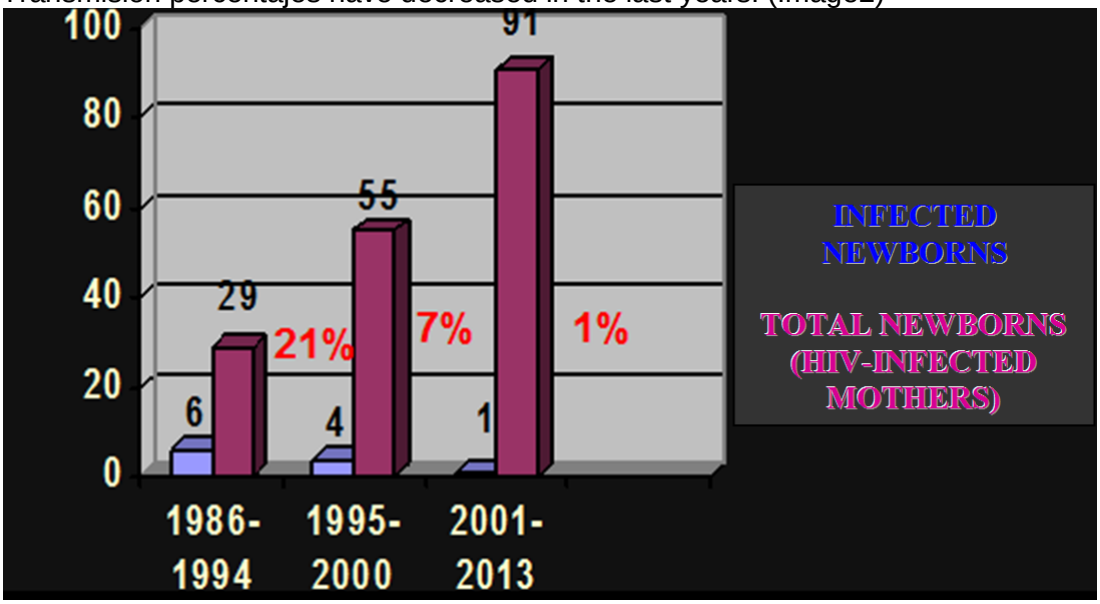
3.- 2001 – 2013: Programmed caesarean at 38 weeks, HAART during the pregnancy and use of three drugs in the newborn (zidovudine, lamivudine y nevirapine)

(Image1).

AR treatment during pregnancy	CV mother	delivery	Newborn treatment
Correct (HAART)	Indetectable (<50 copies)	Caesarea	AZT (6 weeks)
		Vaginal	AZT + NVP (2 dosis)
	50-1000 copies	Caesarea	AZT + NVP (2 dosis)
		Vaginal	AZT + NVP + 3TC (1 week)
	>1000 copies	Caesarea	AZT + NVP + 3TC (1 week)
		Vaginal	AZT + NVP + 3TC (6 weeks)
No treatment	Unknown	Indistinct	AZT + NVP (2 weeks) + 3TC

RESULTS:

Transmision percentajes have decreased in the last years: (Image2)



- 1. 1986-1994: 6 infectios of 29 deliveries: 20.6%.
- 2. 1995-2000: 4 infections (in two cases the pregnancy wasn't controlated) of 55 deliveries: 7.2%.
- 3. 2001-2013: 1 infection (no treatment because late diagnosis) of 86 deliveries: 1.1%.

CONCLUSIONS:

Percentages of VIH vertical transmission in our hospital have followed the general trend due to the more aggressive methods of prophylaxis.

This work allows us to observe a decrease of vertical transmission in the context of increased use of HAART during pregnancy and universal intrapartum and neonatal prophylaxis.

ESPID-0483

TIME TO POSITIVITY OF BLOOD CULTURE IN NEWBORNS WITH BLOOD STREAM INFECTIONS: FAST IS FURIOUS

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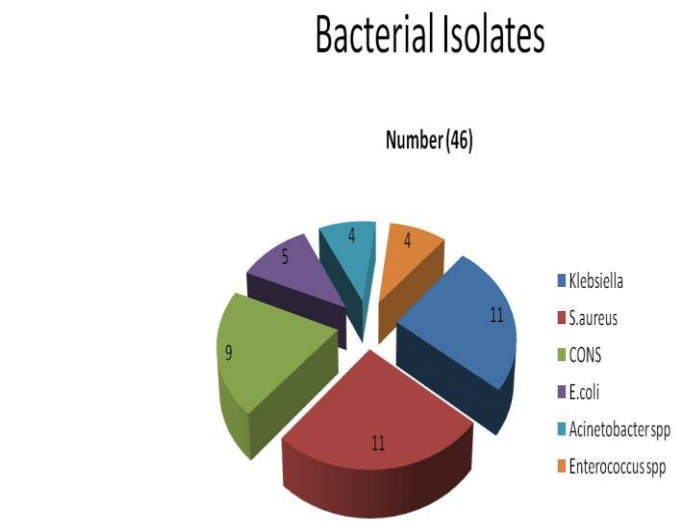
Introduction: Gold standard for diagnosing Blood stream infection is a positive blood culture. It is common practice to delay reporting a negative culture varying from 3 to 7 days.

Objective: of the study was to determine the time to positivity (TTP) of neonatal blood cultures and to investigate whether this differed by various newborn characteristics.

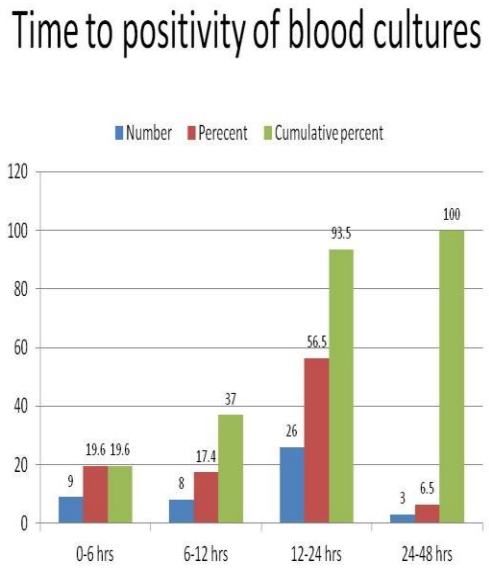
Method: The TTP of a blood culture was taken as the time from inoculation of the blood into the culture bottle to time at which the BacT/Alert machine signaled a positive result. Data was retrieved from the case records of the newborns with positive blood cultures from January 2012 to December 2012.

Results: Forty six (18.5%) out of total of 248 blood cultures sent grew bacteria. *Klebsiella spp.* and *S.aureus* were the commonest bacteria grown. Overall TTP was 14.0 (Median), 9.75-18.5 hrs (Q_1-Q_3). Ninety four percent of the cultures had TTP less than 24 hrs. There was no statistically significant difference in TTP between newborns with various characteristics (risk factors, gram negative organism, ventilation, central catheter use, and time of onset of sepsis). Newborns who died had significantly lower TTP than those who survived.

Conclusion: The study suggests that majority of positive blood cultures are detected within 24 hrs. Newborns who died had significantly lower TTP as compared to those



who survived.



Patient characteristics and TTP

(Mann- Whitney Test)

Characteristic	Number	Median (Q1-Q3) hrs	P
Maternal risk factors present versus absent	27/19	14.0 (9.0-20.0) versus 14 (10.0-18.0)	0.98
Gram positive versus Gram negative	24/22	14.0 (10-16.75) versus 14.5 (8.25-24.0)	0.55
EOS versus LOS	18/28	11.0 (5.75-17.25) versus 14.5 (12.25-19.5)	006
Ventilated versus Not Ventilated	22/24	13.0 (6.75-15.5) versus 14.5 (12.25-24.0)	0.08
Central Catheter versus no Central Catheter	19/27	12.0 (6.0-15.0) versus 15.0 (12.0-24.0)	0.08
Died versus Survived	20/26	11.0 (6.25-14.0) versus 16.5 (13.5-24.0)	0.006

Multivariate Linear Regression Analysis TTP

Factors	Standardized β coefficient	Confidence Interval		P Value
Died	-6.39	-11.261	-1.508	0.011

Multivariate linear analysis revealed that risk of mortality decreased as the time to positivity increased

ESPID-0484

MOLECULAR EPIDEMIOLOGY OF HAND, FOOT AND MOUTH DISEASE IN SOUTH CHINA DURING A HIGHLY EPIDEMIC PERIOD IN 2008

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Introduction: IHand, foot, and mouth disease (HFMD) is of serious concern in Asia-Pacific region as a result of several major epidemics with high fatality rates in recent years.
Aims: To develop a sensitive and effective assay for early rapid enterovirus molecular genotyping and to analyze the viral molecular epidemiology of pediatric HFMD that occurred in South China during a highly epidemic period in 2008.
Methods: Direct enterovirus genotyping was carried out by using a general primer and a degeneracy primer designed to amplify the 5' non-coding region of enterovirus, including human Coxsackievirus A and B, EV71, Echovirus and enterovirus group A, B, C and D. PCR products were then sequenced and blasted in GENBANK/EMBL/DDBJDD.
Results: The assay we developed is rapid and effective, the 5' non-coding region was amplified from simple clinical throat swab samples. EV71 and human Coxsackievirus A16 were identified as the main agents responsible for HFMD in this highly epidemic, although there were also many other viral strains such as Fuyang, Australia, Singapore, India and USA-Canada strains of EV71 virus, Coxsackievirus A5, A10, A14, Coxsackievirus B, and Echo virus related. Type 84 and type 100 enterovirus were also observed for the first time in China.
Conclusions: 5' non-coding region PCR-sequencing is a sensitive and early rapid method for HFMD pathogen genotyping and surveillance. EV71 and human Coxsackievirus A16 were the primary enteroviruses responsible for this HFMD outbreak, enterovirus type 84 and type 100 may also contribute to the highly epidemic nature of this outbreak.

ESPID-0485

MORTALITY AND HOSPITALISATIONS ASSOCIATED WITH A MEASLES OUTBREAK IN THE NETHERLANDS IN 2013

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Introduction

In the Netherlands, a measles outbreak is ongoing since May 2013, mainly among unvaccinated orthodox Protestant children. Currently 2480 cases are reported.

Objectives/aims

To assess the burden of disease, we analysed data on hospitalised cases.

Methods

Measles is a notifiable disease in the Netherlands. All measles cases below 19 years of age notified between 1.5.2013 and 11.12.2013 were included in the analyses. We analysed the following variables: hospitalisation, vaccination status, reasons for hospitalisation, outcomes, length of stay, age distribution, and risk of hospitalisation by age.

Results

In total 2277/2480 (92%) cases were below 19 years of age. Of these, 126 (5.5%) were hospitalised. Almost all (n=121; 96%) were unvaccinated. Pneumonia was the most frequent reason for hospitalisation (48%). One patient died due to pneumonia and encephalitis. Another patient with encephalitis had serious neurological complications and sequelae. In 20% of hospitalised patients no complications were reported. The median length of hospital stay was 3 days. The risk of hospitalisation was highest in children aged 0-13 months (12% hospitalised) and lowest in children aged 9-12 years (3% hospitalised). Risk increased again with increasing age.

Conclusions

So far, the measles outbreak caused one death and 126 hospitalisations among children in the Netherlands. The proportion hospitalised of 5.5% was higher than during the previous outbreak in 1999/2000 (2.1%), while the length of stay was shorter. This might be explained by the implemented control measures and media attention which possibly increased awareness about severe complications among parents and caretakers.

ESPID-0487

METABOLIC ACTIVITY OF INTESTINAL MICROFLORA AMONG ANTIBIOTIC-ASSOCIATED DIARRHEA

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Aims : To evaluate the level of short chain fatty acids (SCFA) in stool of children with antibiotic-associated diarrhea (AAD).

Objectivs and methods: The study included 58 children aged from 1 to 3 years with AAD. Metabolic activity of intestinal microflora was evaluated based on the level of short chain fatty acids (SCFA) with gas-liquid chromatography analysis. We assessed total levels of acetic (C_2), propionic (C_3) and butyric (C_4) acids as well as anaerobic index ((C_3+C_4)/ C_2).

Results: We detected opposite changes level of SCFA in stool of children with AAD:

intraintestinal “aerobisation " - showed increasing level of acetic acid to 0,725 ±0,011* U (normal values 0,684 ± 0,009 U, * difference between levels of SCFA if compare with normal values ($p<0,05$)), as well as decrease the levels of propionic 0,156 ± 0,008 *U (n= 0,159 ± 0,008 U) and butyric acids to 0,119 ± 0,004 *U(n= 0,156 ± 0,004 U). Anaerobic index (AI) was changed to less negative value ?? - 0,379 ± 0,012 * (n= -0,461 ± 0,012).

intraintestinal " anaerobisation " – showed decreasing level of acetate to 0,553 ± 0,008 U ($p<0,05$) and increasing levels of propionic to 0,228 ± 0,008 U ($p<0,05$) and butyric acids to 0,219 ± 0,007 U ($p<0,05$). AI was changed to sharply negative values ??of - 0,808 ± 0,021 * ($p<0,05$).

Conclusion: SCFA levels in stool can be an objective marker of the state of intestinal microflora. Levels of SCFA shows the negative impact of ABT on intraintestinal environment.

ESPID-0490

FOLLOW UP OF CASES, AND HOUSEHOLD CONTACTS, OF WOMEN WITH HEPATITIS B DIAGNOSED BY THE ANTENATAL SCREENING PROGRAMME IN NORTHERN IRELAND

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Introduction
Pregnant women in Northern Ireland are offered screening for hepatitis B, syphilis and HIV infections, and rubella immunity. The Public Health Agency (PHA) recommends that women with hepatitis B are referred to GUM and hepatology; their infants are vaccinated and screened; and contacts are identified, tested and vaccinated. Audits elsewhere in the UK have shown deficiencies in follow up of contacts.
Aims
Assess completeness of the vaccination programme for babies born to women with hepatitis B, and PHA follow-up for the women, and their household contacts.
Methods
Timeliness and coverage data was analysed for infants born from 2008-2013 including: HBIG at birth, doses of Hepatitis B vaccine (HBV) and whether serology performed. PHA database was analysed for evidence that referral to GUM and hepatology was recommended; and GP advised serology and vaccination of contacts.
Results
In 2013, 100% of infants received 3 doses vaccine by 4 months of age, and 85.7% had 4 doses by 24 months. Between 2008 and 2013 HBsAg measurement by 24 months increased from 30% to 85%, and for infants born to eAg positive women from 33% to 100%.
84% of cases had household contacts listed, with 27% having an adult partner listed. 53% of contacts aged under 18 years had a three dose vaccine course, and HBsAg measured.
Conclusion

Compliance with the vaccination programme and HBsAg measurement is good for babies. Recommendations to improve follow up of household contacts include capture a minimum dataset on contacts, introduce a standard letter to the contact's GP.

ESPID-0491

HUMAN CYTOMEGALOVIRUS INFECTION AND BILIARY ATRESIA RELATED WITH OTHER COMPLICATIONS IN INFANTS AT DR. HASAN SADIKIN GENERAL HOSPITAL BANDUNG, WEST JAVA INDONESIA

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Background and aims
Human Cytomegalovirus (HCMV) infection has been associated with intrahepatic bile duct destruction and paucity or extrahepatic biliary atresia (EHBA). Neonatal hepatitis is inflammation of the liver that occurs in early infancy or neonates, developing country such as Indonesia have more of infection by HCMV. Cholestasis jaundice cause by intrahepatic and extrahepatic. The aim this study to determine frequency with patients infected Human cytomegalovirus (HCMV) related extrahepatic biliary atresia (EHBA) and complications that may occur in infants.

Methods
This study was descriptive research, and comprised consecutive infants submitted with cholestasis jaundice due to neonatal hepatitis CMV and biliary atresia between Januari 2011 and December 2013 by Gastroenterology hepatology Division at Department of Child Health Dr. Hasan Sadikin General Hospital Bandung, infants age 1-19 months, history, identification, clinical findings, and results of laboratory testing was documented.

Results
All infant with complaints cholestasis 68(100%), obtained boy 40(59%) and girl 28(41%), the most ages was 2 month 20(29%) Hepatomegaly 64(94%), Splenomegaly 19(28%), accompanied by biliary atresia 13(19%), cirrhosis 5(10%) , 1(2%) baby had cortical blindness, Hearing impairment 5(7%), Hydrocephalus 1(2%), 4(8%) palsy cerebral, and 3(4%) intracerebral calcifications, Levels of ALT (alanine aminotransferase) ranged between 25-351 U/L and direct bilirubin 0.67-30.53 mg/dL.

Conclusions
From this study we found that patients with neonatal hepatitis HCMV can be related with the biliary atresia and severe complications such as cortical blindness, hearing impairment, and cirrhosis are frequent.

ESPID-0493

PAEDIATRIC TB COHORT REVIEW IN NORTH WEST ENGLAND

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Background : Cohort review is the systematic audit of management of TB and aims to capture data through project specific data collection forms and qualitative data through narrative and discussions held at the reviews themselves.

Methods: The process was started in the North West of England in 2011 four times per year in each of four areas. We present the results for paediatric cases.

Results: Over the first 2 years there have been 1170 patients discussed at Cohort review of which 63 are under 16 years old (1107 adults): 15 from Cumbria & Lancs (301 adults), 8 from Cheshire & Merseyside (159 adults) and 40 from Greater Manchester (647 adults). The results for children for 9 standards: standardised risk assessment 87% (adult 98%; target 100% to identify complex needs); ≥5 contacts identified per case 80% (adult 52%; target 100% of smear positive cases); contacts assessed 90% (adult 85%; target 90%); child contacts assessed 93% (adult 89%; target 100%); HIV test offered 59% (adult 60%; target 100%); completed treatment <1 year 86% (adult 73%; target 85%); lost to follow up 0% (adult 3%; target <2%); reported <5 days 70% (adult 64%; target 100%); ECM cases categorised (as level 0, 1, 2 or 3) 97% (adult 97%; target 100%).

Conclusion: Cohort review has provided a clinical governance framework for identifying areas for improvement in the management of TB. Management of children is equal or better than that of adults in the same area. Subsequent years will give sufficient numbers to show changes.

ESPID-0494

SEVERITY CRITERIA OF IMPORTED MALARIA IN PEDIATRIC INTENSIVE CARE UNIT: A FRENCH NATIONAL RETROSPECTIVE CASE CONTROL STUDY 2006/2012

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Background and aims: Severity of pediatric malaria is assessed by the WHO's severity criteria. In non-endemic area, the frequency and relevance of these criteria are not known. The objective of this study was to define severity criteria related to Pediatric Intensive Care Unit (PICU) admission in children with imported malaria.

Methods: We conducted a national retrospective case-control study between 2006 and 2012 comparing children admitted in 8 French PICU for imported malaria (n = 55) with a control population visiting pediatric emergency department for malaria (n = 110). Severity was assessed by the number of intensive care therapy performed (mechanical ventilation, blood product transfusion, fluid resuscitation, supportive therapy for intracranial hypertension, renal replacement therapy).

Results: More patients in the case group required at least 1 intensive care therapy (62% versus 10%; $P < 10^{-4}$). Consciousness disorders (60% vs 14%; $P < 10^{-4}$), shock (31% versus 0%; $P < 10^{-4}$), renal failure (22% versus 2%; $P < 10^{-4}$), anemia < 70 g/L (60% vs 7%; $P < 10^{-4}$), thrombopenia < 50 10^3/mm^3 (49% versus 9%; $P < 10^{-4}$), acidosis (34% versus 5%); hyperbilirubinemia > 50µmol/L (32% versus 6%; $P < 10^{-3}$), parasitemia >4% (58% versus 25%; $P < 10^{-3}$) were related to severity. Respiratory distress (6 cases) and hypoglycemia (2 cases) were rarely observed.

Conclusion: In our study most of WHO's severity criteria of pediatric malaria seemed relevant. However respiratory distress and hypoglycemia appeared to be less frequently observed than in endemic area. Thrombopenia seemed interesting as a severity criteria.

ESPID-0497

THE NEUROLOGICAL COMPLICATIONS OF CHICKEN POX IN CHILDREN

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Background and aims

Chicken pox (varicella) is an extremely contagious childhood infectious disease caused by the varicella-zoster virus, usually with a benign evolution. Sometimes, it can have an unfavorable evolution, the neurological complications being the most severe.

Material and method

We have carried out a retrospective study over a period of 5 years on all severe cases of chicken pox admitted into the National Institute of Infectious Diseases “Prof. Dr. Matei Bals”, in which we have closely followed the neurological complications. In these patients, we have monitored age, sex, background, clinical form and the type of neurological complications.

Results

Between 2008 and 2013, 488 children were admitted with the diagnosis of chicken pox. The sex distribution showed a slight prevalence of male children (58%). Most of the cases were registered in the 3 to 5 years age group (68%) and 72% of patients originated from rural areas. Out of all cases, 15.9 % presented neurological complications, the most frequent of which were: febrile seizures, cerebellar ataxia, facial paralysis, Guillan-Barre syndrome and acute encephalitis. 4 of these cases were extremely severe, presenting acute encephalitis with status epilepticus which required orotracheal intubation with mechanical ventilation. 2 of the patients, which were immunocompromised, had unfavorable evolutions resulting in death.

Conclusions

The varicella-zoster infection can present severe clinical forms with development of complications, major neurological sequelae and sometimes death in the immunocompromised patients. Vaccination remains the only prophylaxis for this disease.

ESPID-0498

IMPACT OF PNEUMOCOCCAL CONJUGATE VACCINATION ON S. PNEUMONIAE DISEASE AMONG CHILDREN <5 YEARS OF AGE, ITALY, 2013

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Introduction and aims

Pneumococcal disease epidemiology has changed after introduction of pneumococcal conjugate vaccines. In Italy, seven-valent vaccine (PCV7) was nationally recommended in 2006 and initially introduced in the childhood immunization schedule of eight regions. In 2010, it was replaced by PCV13. PCV vaccination was progressively introduced in all Italian regions and included in the list of *essential health interventions* in 2012. Vaccination coverage in one of the above eight regions (Puglia) is 95.1% for birth-cohort 2010. We estimated the impact of PCV vaccination program on *S.pneumoniae* disease.

Methods

We used hospital discharge records (2001 to 2011 national registry) to calculate outcome specific hospitalization rates (i.e. Invasive Pneumococcal Disease - IPD, Acute Otitis Media - AOM) in pre- and PCV era at national level. We computed Hospitalization Risk Ratios (HRRs) with 95%CIs, using outcome-specific Poisson regression models. We stratified this analysis by the regional PCV vaccination history.

Results

The most relevant reduction was observed for IPD with a HRR of 0.66 (95CI%: 0.52-0.84) and 0.51 (95%CI: 0.32-0.81) at national level or if considering the eight regions with a longest history of vaccination respectively; followed by the reduction of AOM with a HRR of 0.61 (95CI%: 0.58-0.65) and 0.63 (95%CI: 0.57-0.70).

Conclusions

PCV vaccination shows a significant impact on invasive disease and nasopharyngeal carriage in children aged <5 years especially in those regions with a longer vaccination history, indicating the importance of achieving and maintaining high levels of vaccination coverage in the target population.

ESPID-0501

PASTEURIZED BREAST MILK, A POTIENTIAL VEHICLE OF COLONIZATION BY COAGULASE-NEGATIVE STAPHYLOCOCCI IN PRETERM NEONATES

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Background and aims: Coagulase negative staphylococci (CoNS) are the most represented group of bacteria in raw breast milk and stools of very preterm neonates. CoNS are also a leading cause of late-onset sepsis in preterms and similarity between CoNS isolated from stools and neonate blood cultures suggests a causal relationship. Preterm infants are frequently fed with pasteurized breast milk (PBM) from milk bank and the pasteurization process should completely eliminate remaining CoNS. The aim of this study was to search for CoNS in PBM by cultivation and cultivation-independent methods to investigate the possible role of PBM as a vehicle for the transmission of CoNS to the neonates fed with PBM.

Methods:

- 603 samples of PBM from milk bank

- Conventional and optimized culture of PBM, and *rpoB* gene-based identification of CoNS.

- Cultivation-independent method after DNAse digestion of free DNA (*tuf* gene based-PCR followed by temporal temperature gradient gel electrophoresis, *tuf*-PCR-TTGE).

Results: All conventional cultures were negative. CoNS were isolated from 7/392 samples using optimized culture and identified as *S. epidermidis* (n=5), *S. haemolyticus* (n=1) and *S. warneri* (n=1). Ten samples with negative cultures showed Gram-positive cocci with morphology compatible with *Staphylococcus* spp. Using cultivation-independent approach detecting DNA from whole bacteria, 84/211 samples yielded positive amplification for staphylococci, *S. epidermidis* representing the major detected species (64%) before *S. haemolyticus* (13%).

Conclusions: We showed that viable and cultivable CoNS persisted in breast milk after pasteurization. PBM could supply intestinal reservoir of CoNS species involved in preterm infant infections.

ESPID-0502

A CHILD WITH MARKED EOSINOPHILIA DUE TO RECURRENT TOXOCARIASIS

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Background and aims:

Toxocariasis is a helminthozoonotic disease caused by larvae of *Toxocara spp*. The classical abnormalities in laboratory studies are leukocytosis with significant eosinophilia and increased IgE level.

Methods:

A case report.

Results:

A 8-year-old girl, with cerebral palsy was admitted to Pediatric Infectious Diseases Department due to leukocytosis with significant eosinophilia and positive specific titers for *Toxocara* (TES-ELISA). Due to mental retardation, the child spent most of her time playing on the floor and having contacts with her grandparents' dogs. On clinical examination: cervical lymphadenopathy, physical and mental retardation. Laboratory tests revealed leukocytosis ($33{,}8x10^3/mm^3$) with eosinophilia (78%) (absolute eosinophil count-$26{,}2x10^3/mm^3$), IgG titer for *Toxocara* positive, increased IgE level. The girl had bone marrow aspiration done to rule out leukemia. No pathological changes on chest radiography, abdominal ultrasonography or funduscopic examination were found. The child was treated with albendazole (4 cycles) and diethylcarbamazine (2 cycles) in the period of 14 months. Eosinophilia consistently decreased but is still elevated at $1{,}0x10^3/mm^3$. The child remains under the medical care of our outpatient clinic.

Conclusions:

It is difficult to remove the cause of the infection due to severe retardation of the child since the girl does not communicate or make any complaints. In such a child recurrence of the disease may cause persistence of eosinophilia and specific antibodies.

ESPID-0504

CATHETER RELATED LEUCONOSTOC MESENTEROIDES BACTEREMIA: A RARE CASE AND A NOVEL APPROACH

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Introduction: Leuconostoc species are catalase negative, facultative anaerob gram positive stained coccii configured in doubles or chains. Leuconostoc species rarely cause human infections but should be kept in mind in cases of vancomycin resistant gram positive coccii infections. Herein we reported a case of catheter associated bacteremia due to leuconostoc species treated by antibiotic lock treatment.

Methods: Fifty days old girl suffered a duodenum perforation following upper gastrointestinal endoscopy. During surgical repair, a central venous catheter was placed and total parenteral nutrition (TPN) initiated. Two weeks after surgery she had fever, her general appearance worsened. Her peripheral and catheter cultures revealed a gram positive coccii identified as Leuconostoc. Her antibiotic therapy of cefoperazone-sulbaktam and vancomycine therapy was changed to ampiciline and linezolid. The catheter was accidentaly removed and another catheter had to be introduced during ongoing bacteremia. Cultures remained positive. The growth of *Leuconostoc* from a catheter was at 13th hours and the same growth was detected from a peripheral vein was at 28th hours. It was accepted as catheter-related bacteremia, so that catheter lock therapy was reinitiated. On second day of lock therapy, her fever subsided. The blood cultures sterilized. She received systemic antibiotics for 21 days, antibiotic lock therapy for 12 days.

Conclusion: in cases of catheter associated blood stream infections where systemic antibiotherapy fails and catheters can not be removed, antibiotic lock therapy may be a therapeutic option.

ESPID-0505

ENVIRONMENTAL CONTAMINATION WITH TOXOCARA SPP. EGGS IN NORTHEASTERN POLAND

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Background and aims

Increasing number of children with toxocariasis in outpatient department brought potential sources of infection to our attention. The aim of the study was to evaluate the frequency of Toxocara eggs in the environment.

Methods

Sand or soil samples were collected from: sandboxes located in an urban area of Bialystok, Poland, sandboxes from suburbs, soil from public parks and soil from surroundings of seven patients with confirmed clinical toxocariasis. All the location were open to the public and are freely accessible by both humans and pets. Four samples were collected from each site, seven sites per location in summer (June 2013) and fall (September 2013). All the 196 samples were examined for Toxocara eggs using saline solution centrifuge-flotation, and water sedimentation. Microscopic recognition of eggs was based on the biometrical analysis.

Results

Mean number of eggs in sandboxes dropped during summer both in the urban area (0,5; 0,35) and the suburbs (0,64; 0,18) when it was even higher (0.5; 0.64) in parks (June and September, respectively). The percentage of sites tested positive was 86/71% in the city, 71/57% in the outskirts, 71/71% in parks (June/September). All the samples taken from surroundings of our patients with clinical toxocariasis were positive (100%).

Conclusions

There is an urgent need to prohibit pets from accessing to the sandboxes by covering them when they're not being used.

ESPID-0506

CHRONIC MUCOCUTANEOUS CANDIDIASIS AND ITS GENETICAL BACKGROUND

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Introduction and Objectives: Primary immunodeficiencies present an interesting and dramatically enlarging group of inherited diseases with impaired immune functions. In general, one of the typical clinical symptoms the increased frequency of different complicated infections can be observed. Recently, a new group of diseases with increased susceptibility to particular pathogen was established. One of these diseases is chronic mucocutaneous candidiasis (CMC) which belongs according to the revised classification of primary immunodeficiencies to the group of Defects of innate immunity (Idiopathic infectious diseases).

Aims: The aim of our presentation is to review all the possible genetic reasons for increased susceptibility to Candida infections, analyse the associated non-infections complications and demonstrate the CMC on the series of our patients. We will focus also on the diagnostic possibilities and therapeutic approach to these patients.

Methods: Actually, at least seven different genes can be involved in increased susceptibility to Candida (STAT3, AIRE, CARD9, Dectin-1, IL17RA, IL17F, STAT1)

with different characteristics of causal mutations and different inheritance (Table)

Chronic mucocutaneous candidiasis
classification:

Gene	Inherritance	Mutation type	Clinical symptoms
STAT3	AD	*loss-of-function*	CMC, Hyper-IgE, staphylococcal skin and lung infections
AIRE	AR	*loss-of-function*	CMC, autoimmune polyendocrinopathies
CARD9	AR	*loss-of-function*	CMC, invasive candidiasis
Dectin1	autosomal co-dominant	*loss-of-function*	CMC – isolated mild
IL17RA	AR	*loss-of-function*	CMC, staphylococcal skin infections, foliculitis
IL17F	AD	*loss-of-function*	CMC - isolated
STAT1	AD	*gain-of-function*	CMC, autoimmune thyreoiditis and parathyreoiditis

.

Results: We demonstrate three cases of chronic mucocutaneous candidiasis caused by new, previously non-described autosomal dominant mutation in STAT1 gene in one family.

Conclusions: Chronic mucocutaneous candidiasis presents an interesting example of mono-susceptibility to one pathogen caused by several genes. The understanding of this subgroup of immunodeficiencies allows better understanding of the immune system functions and characterization of antimycotic defence mechanisms.

ESPID-0507

RISK OF GUILLAIN-BARRE SYNDROME AND OF NARCOLEPSY IN CHILDREN VACCINATED WITH AS03 ADJUVANTED A/H1N1 2009 INFLUENZA VACCINE (PANDEMRIX)

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Introduction: Between October 2009, and March 2010, 855 378 children in England received H1N1 vaccine, mostly ASO3 adjuvanted pandemic A/H1N1 2009 vaccine (Pandemrix).

Objectives & Aims: Two different studies were undertaken to look at possible increased risk of Guillain-Barré syndrome (GBS) and narcolepsy after Pandemrix vaccination.

Methods: GBS study: A prospective UK-wide epidemiological study using the British Paediatric Surveillance Unit system. English narcolepsy study: Retrospective analysis. Clinical information and results of sleep tests obtained via hospital notes and General Practitioners and reviewed by an expert panel.

Results : GBS study: 112 children with GBS (66 boys/46 girls) and 3 boys with Fisher syndrome (FS) were identified between September 2009 and September 2011. There was a history of infection in the 3 months preceding GBS or FS in 96 of the 115 cases, but no significantly increased risk of GBS or FS after Pandemrix or 2010/2011 seasonal influenza vaccination (which contained the H1N1 antigen).Narcolepsy study: 75 children had narcolepsy (43 boys/32 girls) symptom-onset after January 2008, diagnosed by July 2011. 11 received Pandemrix before onset; a significantly increased risk of narcolepsy (odds ratio of 14.4 [4.3 to 48.5]). Only 1 of 75 narcolepsy cases had a history of suspected swine'flu infection.

Conclusions: Although both of the disorders are thought to have an autoimmune basis, the results were different. The GBS study showed no increased risk after Pandemrix but most cases were preceded by infections. In contrast the narcolepsy study confirmed increased risk after Pandemrix but found no clear association with preceding infections.

ESPID-0508

FEATURES IN SEPTIC CHILDREN WITH OR WITHOUT SEVERE ACUTE MALNUTRITION AND THE OUTCOME

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Background and aims: Knowledge of biochemical derangements in sepsis among children with severe-acute-malnutrition (SAM) would be helpful. This study aimed to describe the features of sepsis in children with SAM and non-SAM, and the risk/associated factors of death in septic children.

Methods: Children aged 6-59 months with SAM (WHZ <-3) or bi-pedal-edema, and non-SAM admitted with diarrhea+sepsis at the icddr,b's hospital from April-2010 to December-2011 were studied prospectively.

Results: Total 126 (48-SAM and 78-non-SAM) children were studied, all had diarrhea+sepsis. Their mean±SD age was 19.1±14.2 months; 52% were female; capillary-refill-time, neutrophil and band %, BUN, PH, Hb, platelet, serum-TCO_2, phosphate, calcium, CRP, creatinine, and creatinine-phosphokinase were similar between SAM and non-SAM children ($p>0.05$). But, serum-sodium and albumin were lower while, leukocyte count, hypoglycemia, septic-shock and mortality were higher in SAM than non-SAM children ($p<0.05$). Logistic-regression showed: septic-SAM children had 13 times more-often chance of fever or hypothermia than septic-non-SAM children.

Among these 126 children, 25 (19.8%) died. WHZ(-3.0±2.1 vs. -2.7±1.5), % band-cell(5.2±6.4 vs. 2.6±5.5), Na(154±29 vs. 142±21), BUN(25.7±21.5 vs. 17.8±16.1), and septic-shock(92% vs. 9%) were significantly higher, and Hb(9.2±1.6 vs. 10.3±2.0) and albumin(2.9±1.1 vs. 3.4±0.8) were significantly lower among who died than alive children respectively. Logistic-regression showed: children who died were 4 times more likely to be severely wasted and 3 times more likely to had moderate-anemia.

Conclusions: Case fatality rate is significantly high in sepsis particularly in septic-shock and SAM children. These features may help in the better management of septic-children with/without SAM and thus reduce fatality.

ESPID-0509

THE IMPACT OF AGE ON PHA-INDUCED INTERFERON-GAMMA RESPONSES AND INDETERMINATE QUANTIFERON-TB GOLD ASSAY RESULTS

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Background: Indeterminate QuantiFERON-TB-Gold-in-tube (QFT-GIT) assay results are relatively common in paediatric patients undergoing assessment for tuberculosis. Previous data indicate indeterminate results are predominately due to failed positive controls (ie insufficient interferon-gamma-response to phytohaemagglutinin (PHA)). Currently, data regarding the influence of age on the magnitude of PHA-induced interferon-gamma-responses are limited.

Methods: Analysis of data from 1098 QFT-GIT performed at a regional reference laboratory in England over a one-year-period (January-December 2013).

Results: Of 77 QFT-GIT in children (<18 years), 13 (16.8%) were positive, 57 (74.0%) negative, and 7 (9.1%) indeterminate; all indeterminate results were due to failed positive controls. Of 1021 QFT-GIT in adults (≥18 years), 140 (13.7%) were positive, 841 (82.4%) negative, and 40 (3.9%) indeterminate; 3 (7.5%) indeterminate results were due to high interferon-gamma concentrations in the nil sample; 37 (92.5%) were due to failed positive controls. The proportion of indeterminate results was significantly higher in children compared with adults (p=0.0406). In children there was a significant positive correlation between age and interferon-gamma-response in the positive control sample (Pearson's-correlation-coefficient r=0.24;p=0.0391); in contrast, in adults a significant inverse relationship was observed (Pearson's-correlation-coefficient r=-0.11;p=0.0002).

Discussion: The results show indeterminate QFT-GIT results are significantly more common in children, and primarily result from failed positive controls. There is a significant trend for individuals at both ends of the age-spectrum to generate lower PHA-induced interferon-gamma-responses, likely reflecting immune-maturation and immune-senescence. Therefore, development of age-specific cut-offs for positive controls or use of an alternative T cell stimulant may help reducing the unacceptable rate of indeterminate results.

ESPID-0510

SIMILAR ANTIBODY LEVELS IN 3-YEAR OLD CHILDREN VACCINATED AGAINST MEASLES MUMPS AND RUBELLA AT THE AGE OF 12 MONTHS OR 18 MONTHS

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Background and aims: MMR (measles-mumps-rubella) vaccinations have been offered to Finnish children at the age of 18 months and at 6 years. Following the measles epidemic in Europe the recommendation was temporarily changed advising the first dose to be administered already at 12 months since May 2011. Previous studies suggest that the MMR vaccine is less immunogenic when the first dose is given to children younger than 12 months. In this study we compared the antibody levels of children vaccinated at 12 or 18 months.

Methods: Fingertip capillary blood samples were collected from 195 3-year old MMR-vaccinated Finnish children. Eighty-five children had been vaccinated at the age of 12 months (11 to 14 months) and 69 at 18 months (17 to 20 months). Serum IgG antibodies to MMR antigens were measured with ELISA.

Results: There were no significant differences in the mean IgG antibody concentrations against measles (4075 versus 4190 mIU/ml), mumps (titer 1817 vs. 1361) and rubella (78 vs. 93 mIU/ml) antigens detected in children vaccinated at 12 months compared to children vaccinated at 18 months, respectively. Equally high proportions of the samples were positive for measles (98 vs. 99%), mumps (89 vs 81 %) or rubella (100%) antibodies.

Conclusions: Our results indicate that the immunogenicity of the MMR vaccine, measured with ELISA, is not inferior when given to 12 month-old children. Thus, MMR vaccination at 12 months instead of 18 months is recommended in order to narrow the unprotected time between maternally acquired and vaccine induced antibodies.

ESPID-0511

EVALUATION OF PRETRAVEL PREVENTION AND MORBIDITY IN CHILD TRAVELLER

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Background and aims: Many French families are travellers and need some advices before their departure. The aim of the study was to evaluate the quality of prevention and healthcare services provided for these travellers.

Methods: Data were collected retrospectively from anonymous questionnaires proposed to families consulting, irrespective of their reason, in 3 paediatric emergency departments in Paris with a recent travel (one year before).

Results: A total of 166 children were included, 80% were familiar in their country of birth. Thirty six percent were less than 2 years old. Two third of them were visiting friends and relatives in sub-Saharan Africa and North Africa. Seventy eight percent had received consultation before their departure. The hepatitis A vaccine was poorly prescribed. Fifty four percent had health problems in the foreign country: diarrhea (39%), fever (31%), dermatitis (35%), malaria (13%). Those pathologies required medical consultation (28%), purchase of drugs (40%) and hospitalization (5%).

Conclusion: There is poor counselling on basic prevention (hygiene, diarrhea, malaria, immunization). Time constraints in pediatricians and competing priorities could explain this lack. The challenge for healthcare providers to reduce these pathologies is to provide services of sufficient quality and clarity. All medical stakeholders have an important role.

ESPID-0512

FIRST HUMAN CASE OF RICKETTSIA SIBIRICA MONGOLOTIMONAE INFECTION IN NORTHERN GREECE IN A TEENAGER FROM THRACE

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Background: *Rickettsia sibirica mongolitimonae* (*RSM*) is the etiologic agent of lymphangitis-associated rickettsiosis.

Patient and methods: A 13.5-year-old boy presented to us with intermittent high fever up to 39.7°C, dizziness, and weakness. Ten days prior to admission he made a trip to Samothraki Island for recreational purposes, where he reported consumption of home-made dairy products, and frequent walks to the woods. Physical examination showed a 1 cm healing eschar on the right upper chest consistent with recent tick bite, along with regional lymphangitis, a palpable spleen tip, and a generalized faint maculopapular rash. Laboratory investigations showed leukopenia with intense left shift and thrombocytopenia. The patient defervesced within 48 hours after starting intravenous ceftriaxone along with oral doxycycline and rifampicin. Conventional microbiological tests for leishmaniasis and brucellosis were negative. Two serum samples along with whole blood, obtained 24 days following the onset of illness and 12 weeks later were tested for tick-borne pathogens. Real-time PCR on DNA extracted from blood targeting *Rickettsia* spp., *Anaplasma phagocytophilum* and *Borrelia* spp was negative. Serum was also tested by IFA for antibodies against 6 *Rickettsia* spp., *Borrelia* spp. and *A. phagocytophilum*.

Results: The patient's acute phase serum was positive for IgM antibodies (titer 1/1600) and negative for IgG antibodies against *RSM*. The convalescent serum revealed IgG antibodies (1/480), and a dropping IgM titer (1/200) against the same pathogen.

Conclusions: *RSM* appears to be an emerging pathogen in Greece. Clinicians treating patients with fever and an inoculation eschar should consider rickettsioses and request appropriate serological testing.

ESPID-0515

AVIDITY OF ANTI-HPV-16/18 ANTIBODIES AFTER 2- OR 3-DOSE VACCINATION WITH THE HPV-16/18 AS04-ADJUVANTED VACCINE: POST-HOC ANALYSIS RESULTS FROM A RANDOMISED TRIAL

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Introduction: This phase III, randomised, open-label, multi-centre trial (NCT01381575) demonstrated that a 2-dose schedule (2D) of the human papillomavirus (HPV)-16/18 AS04-adjuvanted vaccine administered to adolescent girls was immunologically non-inferior to a 3-dose schedule (3D) in young women (using ELISA).
Objectives: To assess the quality of the antibody response, we evaluated the avidity of anti-HPV-16/18 antibodies following vaccination.
Methods: Healthy 9–14-year-old girls were randomised (1:1) to receive 2D of HPV-16/18 AS04-adjuvanted vaccine at Months 0,6 or Months 0,12; healthy 15–25-year-old women received 3D at Months 0,1,6. A subset of 2D(0,6) and 3D(0,1,6) participants was randomly selected for the descriptive, post-hoc avidity analysis. Serum samples collected at Month 7 were incubated with HPV-16 or HPV-18 virus-like particles. Avidity index (AI) was calculated as the ratio of antigen-specific antibody concentrations (ELISA) with/without 1 molar NaSCN chaotropic agent.
Results: 49 samples from 2D(0,6) and 45 samples from 3D(0,1,6) participants were analysed based on the according-to-protocol cohort for immunogenicity. The geometric mean AI for anti-HPV-16 was 88.8% (95%CI:86.9,90.9) in the 2D(0,6) group and 92.8% (95%CI:89.8,96.0) in the 3D(0,1,6) group; for anti-HPV-18, AI was 89.6% (95%CI:86.9,92.3) in the 2D(0,6) and 84.8% (95%CI:81.8,88.0) in the 3D(0,1,6) group.
Conclusions: Antibody avidity appeared similar between 2D administered in adolescent girls and 3D in young women for both anti-HPV-16 and anti-HPV-18 antibodies measured at Month 7. These data further support the similar immunological profile of the HPV-16/18 AS04-adjuvanted vaccine administered as 2D in adolescent girls compared to the standard 3D in young women.

ESPID-0518

CAMPYLOBACTERIOSIS IN CHILDREN IN ST PETERSBURG, RUSSIA

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BACKGROUND & AIM: Campylobacteriosis in children is poorly described in Russia. This work aimed to ascertain clinical manifestations and the burden of campylobacteriosis in children hospitalised with diarrhoea in the Research Institute of Children's Infections, St Petersburg, in 2003-2012.

METHODS: Clinical manifestations were recorded prospectively in 2003-2006. Stools were tested by bacterial culture and PCR assays. In 2003-2006 ?mpliSens® monoplex PCR (*Campylobacter spp*.) and in 2007-2013 AmpliSens® OKI screen-FL multiplex PCR (Enteroinvasive *E. Coli, Salmonella, Shigella, Campylobacter* spp. and Adenovirus F, Rotovirus A, Norovirus genotype 2, Astrovirus) were used .

RESULTS: In 6346 children aged <16 years admitted with diarrhoea, of all verified diagnoses by stool culture or PCR, 19.8% had bacterial diarrhoea. Of these the proportion of campylobacteriosis increased from 17.2% to over 30% from 2003 to 2012. Over the last three years campylobacteriosis comprised 3.5-4% of all verified diarrhoeal infections. Twice as many cases were confirmed by PCR compared to cultures. Of first 126 children in the study with confirmed diagnosis, 83% presented with inflammatory diarrhoea (mucus, pus and/or blood in stool) and 17% with watery diarrhoea (Table). Antibacterial resistance tests on selective samples showed 5%, 7% and 19% of bacterial isolates were resistant to erythromycin, azithromycin and ciprofloxacin respectively.

CONCLUSION: Campylobacteriosis is an important cause of diarrhoeas in hospitalised children in St Petersburg. Most children presented with colitis. PCR assays offered rapid diagnosis and increased microbiological confirmation. A small

proportion of tested isolates were resistant to macrolides.

Table. Clinical and laboratory manifestations (n=126)

Clinical symptoms	Number (%)	Laboratory manifestations	Number (%)
Fever >38.5C	84 (66.7%)	Elevated WCC	40 (31.7%)
Febrile seizures	4 (3.2%)	Left shift to immature leukocytes	89 (70.6%)
Vomiting more than once	64 (50.8%)		
Severe abdominal pain mimicking acute surgical abdomen	9 (7.1%)	ESR >10 mm/hour	59 (46.8%)
Stool >5 times a day	100 (79.3%)	Elevated ALT or AST >1.5 ULN	2 (1.6%)
Moderate or severe dehydration	18 (14.3%)		
Tenesmus, tenderness in the sigmoid colon region	68 (54.0%)	Leucocytes >20 per microscopic field in stool microscopy	99 (78.6%)
Watery diarrhoea	21 (16.6%)	Erythrocytes in stool microscopy	54 (42.8%)
Bloody stool	48 (38.1%)	Reactive proteinuria	2 (1.6%)

ESPID-0519

THERMOGRAPHY, A NEW DIAGNOSTIC TOOL IN PAEDIATRICS

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Background: Thermography is a non-lesive, non-radiating and low-cost technique, that assess thermal pattern of the skin surface. It has been used since 1987 as a reliable diagnostic tool in some diseases: superficial infections, chronic lumbar pain, diabetic neuropathy,and cancer.

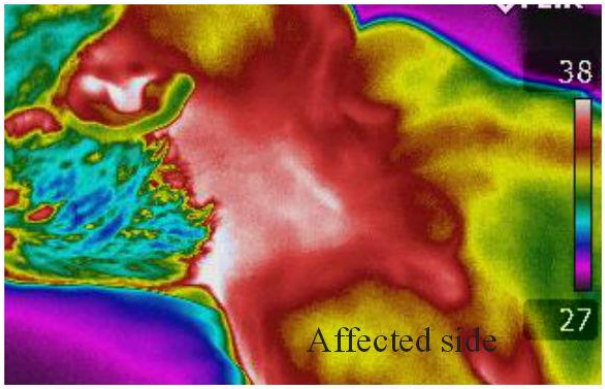
We present a case in which we have used thermography for diagnosing an infectious disease in a child.

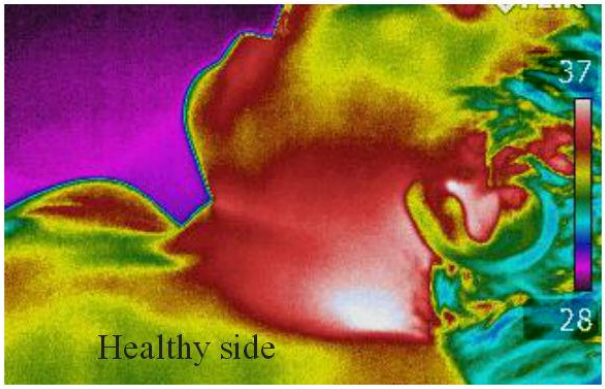
Clinic case: An 8 years old child, with personal history of cerebral palsy and hydrocephaly with ventriculoatrial shunt, was admitted with fever, seizures and irritability at our Department. Physical examination was normal and serial CSF and blood cultures were taken and all resulted negative. Progressive increase in concentration of acute phase reactants was observed. Catheter infection was suspected for neurological symptoms, but due to surgical/technical difficulties, it was not possible to remove the catheter.

Thermography was used observing increase of superficial temperature of the shunt's traject comparing with contralateral side. Oral linezolid was administered with disappearance of symptoms and normalization of the thermography images and acute phase reactants.

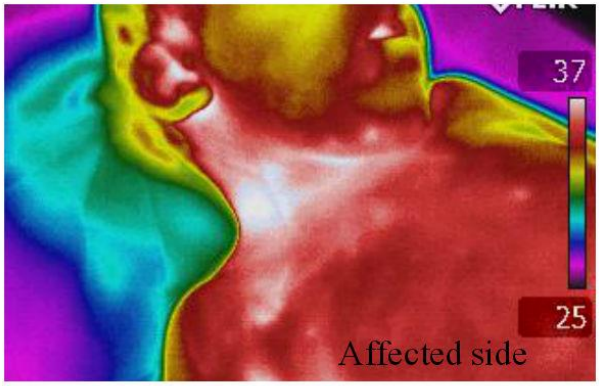
Conclusions: Thermography is non-invasive technique and it is a useful tool for the diagnostic and management of superficial infections, specially in children with comunication disabilities. Nowadays, more research is needed to improve the interpretation of its results. The lack of specificity makes it necessary to combine these measurements with other image modalities.

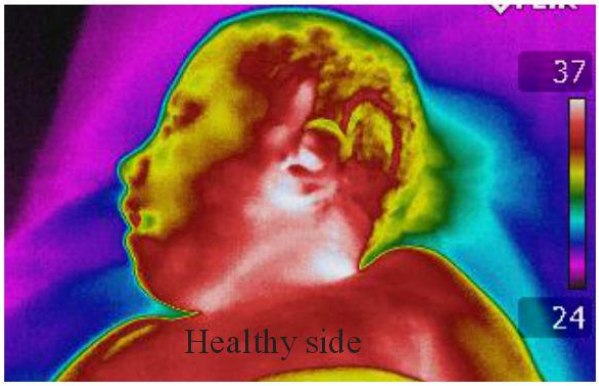
Thermographic imagine before treatment





Thermographic imagine after treatment





ESPID-0521

B-SIDES SEROLOGICAL MARKERS FOR FLU VACCINATION IN IMMUNE-COMPROMISED PATIENTS

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Introduction: Yearly immunization against seasonal influenza is highly recommended for immune-compromised individuals but evaluating the success of vaccination by serological markers may not be fully informative in this population. Recently, it has been hypothesized that the generation of long-lasting immune responses may depend on whether similar antigens challenge the immune system frequently and intermittently.

Aims: In order to search for additional correlates of successful influenza vaccination and to further dissect this theory, both humoral and memory B-cell responses to the trivalent 2012/2013 seasonal influenza vaccination has been evaluated in HIV-1 infected children (HIV) and in kidney transplanted children (Tp) as compared to age-matched healthy controls (HC).

Methods: The seasonal unadjuvanted 2012/2013 influenza vaccine was administered to 59 HIV, 78 Tp and 23 HC. Immunogenicity was evaluated by strain-specific standard hemagglutination inhibition (HI) assay and B-cell enzyme-linked immunosorbent spot (ELISpot).

Results: A high number of HIV and Tp had protective antibody levels prior to vaccination and showed low seroconversion rates after vaccination as compared to HC. On the contrary, similar frequencies of influenza-specific memory B-cells were detected in all groups suggesting that an adequate B-cell response has been elicited. Moreover, the data pointed out decreasing antibody but not memory B-cell responses for HIV and Tp being vaccinated for a greater number of years.

Conclusions: Further investigations are required to standardize the influenza-specific B-cell ELISpot and to understand whether it could be used routinely as an additional tool to evaluate response to influenza vaccination in immune-compromised individuals being vaccinated yearly.

ESPID-0523

PEDIATRIC UROPATHOGENS AND THEIR ANTIMICROBIAL SUSCEPTIBILITY PATTERNS IN THRACE, GREECE

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Background and aims: Urinary tract infections (UTIs) are common in children, especially infants. Knowledge of the local antibiotic susceptibilities is important for successful empirical antibiotic therapy.
Methods: We studied the species of uropathogens in children hospitalized for UTIs in our hospital between October 1, 2008 and March 27, 2013, and their antibiotic susceptibility patterns. Bacterial identification and antibiotic susceptibility testing were performed by the automated Vitek 2 testing system. Minimal inhibitory concentrations (MICs) were determined according to the CLSI criteria, and the results were reported as sensitive, intermediate, and resistant. Intermediate and resistant isolates were grouped together.
Results: A total of 181 children (115 girls, 63.5%) with 183 episodes of UTIs were hospitalized during the study period. The age of the hospitalized patients ranged between 1 month and 14 years (median 15.5 months). The most frequent uropathogens in order of frequency were *E. coli* (140 episodes, 76.5%), *P. mirabilis* (13 episodes, 7.1%), *K. pneumoniae* (10 episodes, 5.5%), *P. aeruginosa* (7 episodes, 3.8%), *K. oxytoca* (4 episodes, 2.2%), *E. faecalis* (2 episodes, 1.1%) and various other less frequent pathogens (5 episodes, 2.7%). Overall, 51.5% of *E.coli* isolates were resistant to ampicillin, 20.9% to amoxiclav, 23.7% to cotrimoxazole, 32.8% to cephalothin, 3.5% to nitrofurantoin, while resistance to 3rd generation cephalosporins (3%) and to aminoglycosides (≤4.5% for amikacin, gentamycin, netilmycin and tobramycin) was rare. Only 7.7% of *P. mirabilis* and 10% of *Klebsiella* spp. isolates was resistant to amoxiclav.
Conclusions: The uropathogens in our area continue to be susceptible to many common antibiotics.

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PRIMARY INOCULATION SKIN TUBERCULOSIS AFTER VARICELLA

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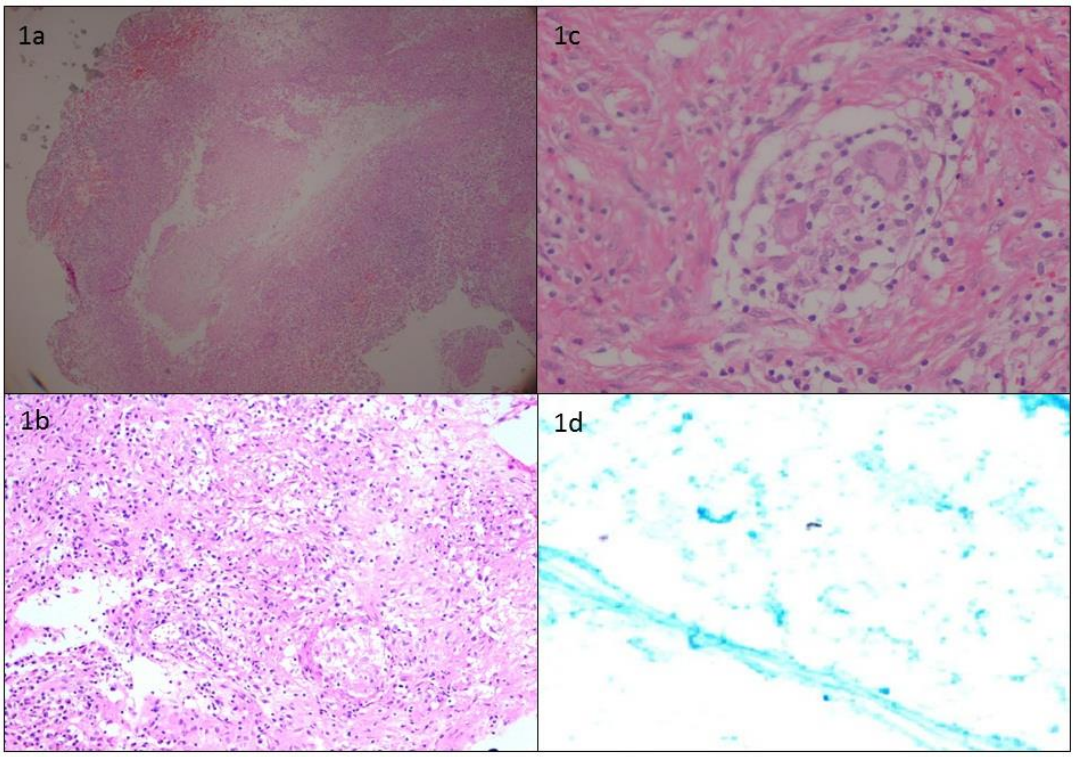
Introduction: Primary inoculation tuberculosis (TB) is a rare form of cutaneous TB that results from the direct entry of the organism into the skin or mucosa of a nonsensitized individual. These lesions develop 2-4 weeks after inoculation, which may be through minor trauma to the skin of various sites. We report a case of primary inoculation TB following varicella in otherwise healthy boy.

Case report:

A 14 month-old boy presented with a 3 week history of a painless, erythematous and ulcerated nodule located 3 cm below the left nipple and he had suffered from varicella 1 month prior to the beginning of the lesion. Magnetic resonance imaging (MRI) showed a large bilobulated mass-like hyperintense lesion with cystic component along the left anterior thoracic wall. The lesion was totally excised and histopathologic analysis showed a granulomatous infiltrate with central caseation necrosis, giants cells of the Langhans type and the presence of acid-fast bacilli (Figure 1). Polymerase chain reaction (PCR) testing of the biopsy specimen revealed the presence of the *Mycobacterium tuberculosis*. These findings established a diagnosis of primary inoculation TB and he was well with no relapse after six months of

standard tuberculosis treatment.



Conclusion: Herpesviruses can cause transient depression of cell-mediated immunity during the acute phase of the illness. In this case, we thought that VZV infection predisposed to primary inoculation skin TB either leading to direct inoculation of tuberculous bacilli through vesicles or by supressing the cellular immunity.

ESPID-0525

PREMATURITY – RISK FACTORS FOR INFECTIOUS PATHOLOGY

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Introduction: Premature babies are at increased risk for the occurrence of infectious pathology.

Objectives: This paper aims to study microbial colonization in the perinatal period , highlighting risk factors for systemic infections in premature infants , the diagnosis of neonatal infection , the evolution and their treatment.

Material and method: The study was done over a period of two years, including premature neonates hospitalized in the neonatal intensive care unit of Neonatology Clinic Bega Timisoara, who presented infectious pathology (positive blood cultures).

Results and discussions: Of total 4675 newborns registered in the respective period 426 infants were low birth weight (<2500g). An important factor in the development of infectious pathology it was premature rupture of the amniotic membranes. Positive blood cultures were present in 48.5% of these newborns. Hospitalization of premature infants in intensive care unit for more than 14 days augments the number of systemic infections. Other predisposing factors were: gestational age below 32 weeks (37.5%), birth weight less than 1500 grams (18.42%), maternal pathology associated, not followed pregnancies.

Conclusions. Microbial infections are one of the most common pathology of premature newborns. A risk factor is prolonged hospitalization. An important criteria for the diagnosis of bacterial infections are positive blood cultures. Antibiotic therapy should be instituted in the presumptive diagnosis phase. The disease in this category of infants depends on the precocity of initiating therapy and associated pathology.

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ESPID-0526

ACUTE MYELOID LEUKEMIA (AML) PRESENTING WITH ECTHYMA GANGRENOSUM AND FATAL PSEUDOMONAS AERUGINOSA SEPSIS

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Introduction: Almost every reported case of ecthyma gangrenosum (EG) in previously healthy children is associated with some type of immunocompromise.
Case report: A previous healthy 22-month old boy with unremarkable family history was admitted to the ICU with septic shock. Two days prior he had a fever of 40ºC, a generalized maculopapular rash and a rapidly evolving ulcer on his left upper arm. On admission, he appeared lethargic, his BP: 60/40 mmHg, HR: 180/min, RR: 70/min, capillary refill time: 5secs. His results reflected pancytopenia (WBC: 1000/ul, Hgb: 9mg/dl, PLT: 115,000/ul), lactic acidosis and DIC. He was immediately intubated and mechanically ventilated and was given fluid resuscitation, inotropic support (intravenous adrenaline, dopamine and dobutamine), FFP, coagulation factors and blood transfusion. Empirical antibiotics were started with gentamycin and ceftazidime. All fluid cultures (blood, bronchial, CSF, skin lesion's) yielded Pseudomonas Aeruginosa, sensitive to the administered regimen. Due to the uncommon pathogen and the severe clinical presentation, a bone marrow biopsy was performed that established the diagnosis of AML (>80% atypical promyelocytes, M3 according to FAB classification). Within 2 days the necrotic lesions extended, occupying the face, trunk, upper and lower extremities, he developed MODS and was placed on a peritoneal lavage. Despite massive intensive care efforts the boy expired on the 4th day of hospitalization.
Conclusion: EG can be an early indication of an undetected malignancy. Prompt identification is crucial to initiate appropriate antipseudomonal therapy and to perform a thorough laboratory investigation, to rule out predisposing causes including congenital immunodeficiencies and cystic fibrosis.

ESPID-0528

EFFECT OF HELICOBACTER PYLORI ERADICATION THERAPY ON THE IRON STATUS IN CHILDREN WITH IRON DEFICIENCY ANEMIA

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Background. Helicobacter pylori infection is related to some specific extragastroduodenal diseases such iron deficiency anemia. **Aim.** To evaluate a causal association between H. pylori infection and iron status and the effect of eradication therapy on outcome of iron-deficiency anemia. **Methods.** 32 patients, aged between 6 and 18 years, were admitted with iron-deficiency anemia. An extensive initial work-up was performed that included the hematologic profile and upper endoscopy. H. pylori status was determined using rapid urease test, histological examination, serologic assays and detection of H. pylori antigen in stool samples. Eradication triple therapy was administered 14 days. **Results.** 32 patients with iron deficiency anemia were included in the study. H.pylori infection was confirmed by specific tests in 18 patients (56.2%). Iron deficiency anemia was defined as a hemoglobin concentration of less than 12 g/dl (5.2-7.0 g/dl), serum iron concentration less than 6.6 µmol/L (2.4-4.0 µmol/L), serum ferritin concentration less than 20 ng/ml (7-10 ng/ml). Upper gastrointestinal endoscopy revealed a marked antral nodularity and a rapid urease test was positive. Histopathology confirmed chronic inflammatory changes. A positive fecal antigen test was detected in the initial stage of infection. Compliance to triple or sequential eradication therapy was good. H. pylori was successfully eradicated. Iron therapy was prescribed and three months later haematological profile was normalized. **Conclusions.** H. pylori eradication therapy is effective in improving iron status especially in patients with moderate or severe iron deficiency anemia. The current recommendation is to search and treat the H. pylori infection in iron deficiency anemia.

ESPID-0529

REDUCTION IN PAEDIATRIC DEATH'S IN A RURAL MALAWI HOSPITAL AFTER COMMUNITY MALARIA PREVENTATIVE INITIATIVES

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Introduction

Nkhoma hospital is a rural hospital in central Malawi . Over the past four years, three community interventions have been put in place aiming to reduce the burden of malaria on the local community. Since 2009 there has been a service level agreement (SLA) with the government giving free malaria to children under 5 years. In 2010 an Indoor Residual Spraying (IRS) program was commenced. The most recent intervention was the distribution of long lasting insecticide treated bednets in May 2012.

Objective

The aim of the study is to analyze the number of Paediatric deaths from malaria from the beginning of the interventions to prevent malaria to the present day.

Methods

We performed a retrospective analysis of inpatient deaths from malaria on the paediatric ward over a three year period from 2011- 2013 inclusive.

We used the hospital log books to source this information.

Results

The number of deaths in 2011 was 106, decreasing to 43 in 2012 and remaining stable at 45 in 2013.

The peak of deaths in all years was in rainy season, The death rate was always highest in January.

Conclusion

We have demonstrated that IRS, the distribution of mosquito nets and the SLA for free malaria treatment in under five population have resulted in a significant decrease in malaria deaths. The most significant drop is from 2011- 2012, which correlates with the introduction of IRS. This information supports the implementation of these initiatives on a nationwide basis.

ESPID-0530

COTRIMOXAZOLE PROPHYLAXIS TO PREVENT MORTALITY IN HIV-UNINFECTED CHILDREN WITH COMPLICATED SEVERE ACUTE MALNUTRITION: DOUBLE-BLIND, PLACEBO-CONTROLLED, RANDOMISED CLINICAL TRIAL

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Introduction: Children with severe acute malnutrition (SAM) have increased risk of mortality from common infections. Amongst children admitted to hospital with SAM, susceptibility to serious infections appears to persist for at least a year following medical stabilisation and nutritional rehabilitation. Daily cotrimoxazole prophylaxis is effective in preventing mortality amongst children with HIV, and is inexpensive and widely available.

Objectives: We sought to determine whether cotrimoxazole prophylaxis could improve survival in SAM.

Methods: We randomly assigned HIV-uninfected children aged 2 to 59 months with SAM admitted to 2 urban and 2 rural hospitals in Kenya to receive daily cotrimoxazole (120mg for age <6 months, 240mg for age 6 months or more) or matching placebo for 6 months, and followed up for 12 months. All children received recommended the antimicrobials, therapeutic feeding, and supportive care according to national guidelines for SAM. The primary end point is 12-month mortality; secondary end

points include 6 month mortality, toxicity, incidence and causes of re-admission to hospital; and growth.

Results: 1,778 eligible children median age 11 months were enrolled, 412 (21%) have oedematous malnutrition. 645 (36%) presented to hospital with severe pneumonia and 1,018 (57%) presented with diarrhoea.

The last follow up is in March 2014 and the trial will report in April. The 12-month and 6-month mortality; the incidence and causes of hospital readmission; grade 3 and 4 toxicity events and growth in the cotrimoxazole and placebo arms will be presented.

Conclusions: Findings will be discussed (Funded by the Wellcome Trust; ClinicalTrials.gov Identifier: NCT00934492).

ESPID-0531

INFLUENCE OF ATMOSPHERIC CONDITIONS IN RSV INFECTION

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Background and aims: Respiratory Syncytial Virus (RSV) is one of the most common causes of respiratory infection in infants. Understanding its seasonality and how meteorological conditions may influence its outbreaks is critical for effective prevention and management strategies. This study aims to establish a relationship between atmospheric factors and the frequency of RSV infections in infants admitted to our Inpatient Paediatric Service.

Methods: A retrospective analysis of clinical files of infants, aged 0-36 months, admitted to Inpatient Paediatric Service with diagnosis of acute bronchiolitis from September 2005 to December 2012 was undertaken. This represents a total of 635 hospital admissions; of these 282 were RSV positive. RSV detection was made by nasopharyngeal aspirate.

Only days with at least two documented children with RSV infection were studied.

Meteorological data (daily air temperature and precipitation) for the same period was collected at Vila Real's weather station.

Results: The results reveal strong seasonality, peaking from December to March (86% of annual admissions with RSV infection).

The analysis on a monthly basis was inconclusive regarding any association between either temperature or precipitation and RSV infections. However, on a daily basis, below average minimum and maximum temperatures from the day of admittance to 4 days before admittance (4-day lag) were identified. No clear connection was found with precipitation.

Conclusions: This study suggests an association with temperature, but not precipitation, in the 4 days preceding hospital admittance in infants with diagnosis of RSV infection.

ESPID-0532

LYME DISEASE- IS THERE A NEED TO INCREASE AWARENESS IN NORTHERN IRELAND?

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Background: Although Lyme borreliosis is the commonest tick-borne infection in humans in the northern hemisphere it is rare in Northern Ireland. We report three recent diverse presentations of this treatable condition to emphasise the significance of considering the diagnosis in children with unusual clinical features.

Cases: The first was a 6 year old boy admitted after five days of pyrexia without source. He was initially managed as a streptococcal illness but then developed features consistent with Kawasaki disease. His fever continued despite immunoglobulin therapy and an extended pyrexia screen revealed positive Lyme serology. His symptoms resolved following antimicrobial therapy.

The second, more classical, case was a 12 year old boy who presented to the emergency department with an erythema migrans after presumed insect bite whilst camping some weeks earlier. The rash resolved when he was treated clinically as Lyme disease and this was confirmed by laboratory testing.

The final, more complex, case was a 13 year old boy who had multiple peripheral neurological signs including bilateral leg weakness with some sensory disturbance, absent reflexes, and reduced power in his right hand and some loss of right arm reflexes. He was managed as a peripheral polyneuropathy and showed some response to intravenous immunoglobluins, physiotherapy and occupational therapy. Lyme serology was positive after discharge and he remains under neurology follow-up after appropriate antibiotic treatment.

Conclusion: These cases highlight the importance of considering this diagnosis despite the low prevalence as treatment significantly reduces the risk of long term complications.

ESPID-0533

ARE CONFIRMED CASES JUST THE TIP OF THE ICEBERG? SEROEPIDEMIOLOGY OF A PERTUSSIS OUTBREAK IN A SCHOOL SETTING

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Background: There has been a marked resurgence of pertussis across the UK since 2011, with a notable increase in incidence amongst older children. In March 2012, a cluster of 7 cases from an English secondary boarding school was reported, triggering an investigation and later a school-wide vaccination campaign. Here we describe the dynamics of this outbreak.

Methods: On 18 April 2012, data on the presence of clinical symptoms (cough), date of onset and duration were collected from a convenience sample of 842 students (65% of school population). Anti-pertussis toxin IgG levels were determined for 327 students (25%) with an in-house ELISA from oral fluid specimens.

Results: 163 cases were identified, of which 29 were seropositive and symptomatic, 54 were seropositive but asymptomatic and 80 were epidemiologically linked. The earliest self-reported cough onset date was September 2011. Seroprevalence increased with age and was highest amongst 17–19 year-olds (36%) who had not received a pre-school booster vaccination. Students were 2.5 times more likely to be seropositive if they had a cough (95%CI RR 1.75–3.56) and coughing students had a higher anti-pertussis toxin IgG titre (geometric mean 152 vs. 54 arbitrary units, *P*=0.0001). There was no significant association between titre and cough duration.

Conclusions: This investigation uncovered evidence of widespread transmission at the school, which began 5 months earlier than the first reported cluster and included a high proportion of asymptomatic cases. These findings highlight the importance of early identification and the need for a rapid response to outbreaks in closed settings.

ESPID-0534

RELAPSED PNEUMOCOCCAL MENINGITIS WITH SUBDURAL EFFUSION SEVERAL MONTHS AFTER INITIAL TREATMENT: A CASE REPORT

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BACKGROUND AND AIMS: Although the incidence of invasive pneumococcal disease (IPD) has dramatically declined since introduction of pneumococcal vaccination, pneumococcal meningitis remains a serious disease, associated with complications.

METHODS: We present a case of relapsed IPD in an infant despite treatment.

RESULTS: A previously healthy, unimmunized, 4-months old female infant had 48 hours of coryza followed by a left-sided focal seizure. She presented to hospital with a status epilepticus requiring termination with phenytoin. *Streptococcus Pneumoniae* was isolated from cerebrospinal fluid and blood cultures, and she was treated for 10 days with parenteral ceftriaxone.

She re-presented 3 months later with seizures. A CT scan revealed a loculated subdural collection over the right frontal pole. Subdural fluid showed no growth on culture, but was positive for *Streptococcus Pneumoniae* on PCR, with the same serotype as the original organism. She received 4 weeks of parenteral antibiotics.

An extensive immunology screen was normal, and she has since been fully immunized.

She made good clinical recovery, with no neurodevelopmental sequelae, normal hearing and resolution of subdural collection, with residual dural thickening.

CONCLUSIONS: We present a case of an infant who likely had a relapse of IPD several months after treatment. This case report highlights the severity of pneumococcal meningitis in young infants, and the importance of timely vaccination to prevent IPD. A longer course of initial parenteral antibiotics may be necessary in infants who have not responded fully to a standard treatment course to prevent complications or subsequent relapse.

ESPID-0535

LONG-TERM SEROPROTECTION AFTER HUMAN PAPILLOMAVIRUS VACCINE IN PERINATALLY HIV-INFECTED GIRLS

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- **Introduction:** The quadrivalent human papillomavirus vaccine (QHPV; Gardasil, Merck and Co.) is effective in preventing genital precancerous lesions in immunocompetent women.
- **Objectives:** We aim to describe the response to immunization and its permanence over time in HIV-infected girls.
- **Methods:** Longitudinal study in 26 HIV-infected girls (median age:15 years) vaccinated with 3 doses of QHPV (P0). IgG-antibodies against HPV types 6, 11, 16 and 18 were semi-quantitatively measured by enzyme-immunoassay (DRG Diagnostics, Germany) in plasma at 2 time points: along the first 6 months (P1) and at least 24 months after vaccination (P2). The results were expressed as an index value directly proportional to the content of IgG in the sample and seropositivity was defined as an index>1.00.
- **Results: Twenty-five** girls were perinatally-infected and 18 had AIDS. One remained antiretroviral naive, 10 had received HAART as first treatment and 15 had interrupted HAART at least once. They were all symptom-free along follow-up, none was severely immunosuppressed and viral load was undetectable in 18/26, 16/26 and 14/18 at P0, P1 and P2, respectively. Seropositivity was detected in 24/26 (92.3%) at 6 months, and loss of serologic response was observed in 3/18 (16.7%) who were re-assessed at P2. Median antibody index levels declined significantly from P1 to P2 (8.56 [3.48-9.79] vs 1.76 [1.24-2.61]; p=.001). A shorter time on HAART and undetectable viral load at vaccination associated a higher rate of seroprotection maintenance.
- **Conclusions: In our series,** serologic response to QHPV and antibody decline were similar to that reported in immunocompetent population.

ESPID-0536

STREPTOCOCCUS PNEUMONIAE DISTRIBUTION IN HOSPITALIZED AND HEALTHY CHILDREN IN LATVIA

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Background and aim: This retrospective – prospective study airmed to define the nasopharyngeal carrier rates of pneumococcus among healthy and hospitalized children.

Materials and Methods: The study involved healthy (n = 68) and hospitalized (n = 203) children with evidence of pneumonia, otitis or invasive pneumococcal disease (IPD). Swabs from nasopharynx and middle ear, blood and CSF cultures were collected. Identification of the isolates was confirmed by optochin sensibility test and in questionable cases with VITEK GN. Serotyping was performed by multiplex PCR.

Results: The study involved 68 healthy children with average age 11.8 months and 203 hospitalized children with average age 50.6 months. 14.7%(10) of healthy children were found to be carriers of pneumococcus and 28.1%(57) of isolates were positive of pneumococcus from hospitalized children. The most prevalent diagnosis was pneumonia – 28%(16). Cultures have been serotyped and serotypes 14 and 19F were the most common pneumococcal serotypes detected – 10.5%(6), next prevalent serotype were 15A/15F, 6 (A,B,C) and 3 – 7.02% (4) each. Serogroup 6 (serotypes A,B,C) was proven to be prevalent (100%) of healthy children.

Conclusions: 14.7%(10) were found to be carriers of pneumococcus and 28.1%(57) of isolates were positive from hospitalized children. Serogroup 6 (serotypes A,B,C) were the most common in carriers and serotypes 14 and 16F were the most common in hospitalized children.

This study was conducted as a part of the State research program “Scientific research with help

of multidiscipline consortium of main pathologies endangering survival and quality of life of

inhabitants of Latvia”.

ESPID-0537

EXCHANGE BLOOD TRANSFUSION IN MALIGNANT PERTUSSIS : WHEN START IT?

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Background: Despite high immunization rates, pertussis disease remains a concern with a high mortality rate in hospitalized infant less than 6 months of age (£1%). In malignant pertussis disease, exchange blood transfusion (EBT) was proposed but there is scant data on the optimal timing to start it.

Methods: We describe five cases of malignant pertussis disease hospitalized during 2013 in a tertiary paediatric Intensive Care Unit with aggressive leukodepletion to purpose key points to determine the useful timing of EBT on outcome.

Results: All infants were younger than 3 months (median age 6 weeks).Median birth weight was 2610g. All patients presented with permanent tachycardia over 170/mn and needed oxygenotherapy. Four patients presented with a respiratory distress with hypercapnia. Four patients had abnormal chest radiography with atelectasis or/and pneumonia. The median peak WBC count was 65 G/L $[53.3\text{-}95.7]_{\text{min-max}}$. Four patients received EBT with a median delay of 3 days $[2\text{-}10]_{\text{min-max}}$. Two patients presented with severe pulmonary hypertension. Fatal outcomes occurred in two patients: one with refractory pulmonary hypertension despite extra corporeal oxygenation, and the second following acute hyperkalemia with arythmia and cardiac failure without EBT due to fulminant evolution.

Conclusion: Malignant pertussis seems to be an actual concern. EBT is an easy leukodepletion method and should be quickly considered in critically infants with malignant pertussis. Monitoring WBC twice a day to track an increase seems to be essential in these patients. A cut off of 50 G/L WBC is a good indicator to start EBT in hypoxic patients with constant tachycardia before the apparition of pulmonary hypertension.

ESPID-0538

SALIVA AND DRIED BLOOD SPOT VIRAL LOAD IN SYMPTOMATIC CONGENITAL CYTOMEGALOVIRUS (CMV) INFECTION AND CMV-ASSOCIATED HEARING LOSS AT BIRTH

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Introduction/Objectives: Congenital cytomegalovirus infection (cCMV) is an important cause of sensorineural hearing loss (SNHL). We sought to determine if DBS (dried blood spot) and saliva viral load at birth are useful in identifying infants with symptomatic cCMV and CMV-associated SNHL at birth.

Methods: Newborns at 7 U.S. hospitals were screened for CMV by testing saliva by rapid culture and/or real-time PCR. DBS were tested by real-time PCR. Infants with generalized petechial rash, purpura, hepatosplenomegaly, jaundice with direct hyperbilirubinemia, chorioretinitis or CNS involvement (microcephaly, seizures and focal deficits) were considered symptomatic. DBS and saliva viral loads were compared between symptomatic and asymptomatic infants and those with and without SNHL at birth.

Results: 462 of 100,605 infants screened had confirmed cCMV. Viral load in DBS did not differ between symptomatic and asymptomatic infants ($2.2x10^3$ vs $2.5x10^3$ IU/ml, p=0.26). Symptomatic infants had higher median saliva viral load ($7.0 x10^6$ IU/mL, range: $1.2x10^2$–$5.5 x10^9$) than asymptomatic infants ($1.8 x10^6$ IU/mL, range: $3.5x10^2$–$1.8 x10^{10}$; p=0.001). Median viral loads in the DBS and saliva were not different for those with SNHL at birth and those with normal hearing.

Conclusions: Saliva CMV viral loads are higher in symptomatic infants compared with asymptomatic babies; however, these measurements are of limited value because of the overlap between the groups. DBS viral loads do not differ between asymptomatic and symptomatic infants. The wide variability in viral loads and the overlap between groups suggests that virus burden in DBS and saliva cannot reliably identify infants with newborn disease and SNHL at birth.

ESPID-0540

PHARMACOKINETICS OF LOPINAVIR/RITONAVIR ONCE DAILY COMPARED TO TWICE DAILY IN VIROLOGICALLY SUPPRESSED, TREATMENT-EXPERIENCED, HIV-INFECTED CHILDREN

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Background and aims

Once daily lopinavir/ritonavir (LPV/r QD) is approved for use in HIV-infected adults but not in children. We assessed the pharmacokinetics of LPV/r in children receiving pediatric LPV/r tablets (100/25 mg) twice daily (BID) and after switching to LPV/r QD according to the FDA recommended weight bands for BID dosing.

Methods

This study is part of the PENTA18 trial (KONCERT), a non-inferiority trial, assessing the virological outcome of virologically suppressed, treatment-experienced children, randomized to receive LPV/r QD or BID. Pharmacokinetic assessment was performed in 26 children divided over three weight bands (15-25kg, >25-35kg and >35kg) at enrollment while receiving LPV/r BID and a second assessment in children randomized to QD at week 4. PK parameters were calculated by non-compartmental analysis.

Results

Twelve of the children were boys, median age (range) was 12.7 (4.4-16.8) years. Geometric mean (95%CI) $AUC_{0\text{-}24,}$ C_{max} (maximum plasma concentration), and C_{last} (last observed plasma concentration within a dosing interval) of LPV were 160.9 (138.4-187.0) h*mg/L, 14.0 (12.7-15.6) mg/L and 1.0 (0.61-1.8) mg/L for QD and 223.9 (194.8-257.4) h*mg/L, 12.5 (11.1-14.0) mg/L and 5.7 (4.6-7.1) mg/L for BID. The geometric mean ratio (90%CI) for these parameters were 0.72 (0.61-0.85), 1.13 (0.99-1.28) and 0.18 (0.11-0.29), respectively. Eleven vs. fifteen children on QD LPV/r had a C_{last} < or >1.0 mg/L. One child failed virologically over 48 weeks and had a C_{last} of 2.1 mg/L.

Conclusions

Administration of LPV/r pediatric tablets QD resulted in lower daily exposure to LPV compared to BID and a lower C_{last}.

ESPID-0541

CHRONIC MENINGITIS AND BILATERAL NEURORETINITIS FOLLOWING MYCOPLASMA PNEUMONIAE INFECTION

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Introduction

We report an unusual case of chronic aseptic meningitis associated with bilateral neuroretinitis following *Mycoplasma pneumoniae* infection.

Case description

A previously well 12-year-old boy presented with a 2-week history of headache, nausea, vomiting and left-sided weakness. He subsequently developed meningism and left abducens nerve palsy. He had persistent papilloedema and reduced visual acuity in association with a bilateral macular star, consistent with neuroretinitis (Fig 1). CSF examination indicated chronic meningitis and serologic testing confirmed recent *M. pneumoniae* infection (Table 1), although PCR in CSF was negative. He was treated with ceftriaxone, acyclovir, azithromycin and acetazolamide with gradual improvement in clinical condition and visual acuity over several weeks.

Discussion

Chronic meningitis following *M. pneumoniae* infection is rare. Evidence of CNS inflammation in the absence of direct infection would suggest an immune-mediated pathophysiology. Optic neuropathy is a rare but well-described ocular complication. The role of antibiotics is unclear because of the uncertain pathogenesis, limited penetration of macrolides and absence of randomized trials. Although the use of macrolides with both antibiotic and immunomodulatory activity might be beneficial, it was not possible to ascertain whether it influenced clinical recovery in this case.

Figure 1

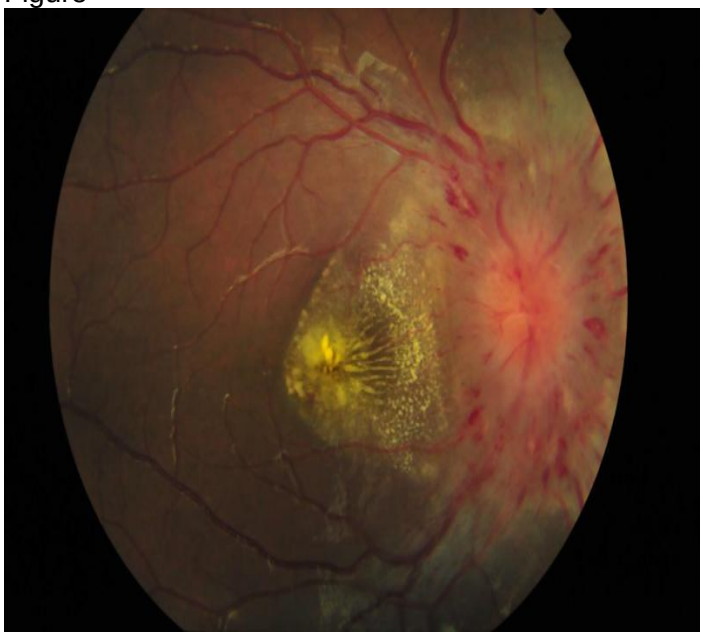

Table 1

Weeks of illness	**CSF WBC (cells/mm^3)**	**CSF lymphocytes (%)**	**CSF protein (mg/dl)**	**CSF glucose (mg/dl)**	**CSF opening pressure (cm water)**	**serum anti-*M.pneumoniae* antibody titres**
2	74	85	61	70.2	Not recorded	1:320
4	40	100	50	55.8	40	
6	33	70	53	68.4	35	1:2560
10	8	100	46	63	Not recorded	1:10240

ESPID-0542

EPIDEMIOLOGY OF BACTERIAL MENINGITIS AMONG UNDER-5 CHILDREN IN SOUTH ASIA

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Background and aims

Meningitis is a leading cause of child death, and recent mortality estimates suggest disproportionate burden in South Asia. We reviewed and synthesised evidence on disease-burden estimates of bacterial meningitis among under-5 children in this region.

Methods

Four electronic databases were systematically searched in November 2013, and abstracts and full-text articles were subsequently screened using *a priori* criteria; potentially relevant surveillance systems were similarly identified and screened. Estimates of incidence and mortality, and trends by person, time, and place were critically appraised and qualitatively synthesised.

Results

Of 196 articles and two surveillance systems identified, 10 articles met criteria for synthesis. Point estimates per 100,000 children for annual incidence were 0–155 probable cases, 14–38 *Haemophilus influenzae* type b (Hib) cases, and 20–28 pneumococcal cases, and mortality rates ranged from 4.0–5.3 deaths. Upon examining age strata, disease-burden estimates were highest among children aged <1 year. All estimates were likely significantly underestimated, and factors leading to underestimation (e.g., prior antimicrobial use) were further characterised. Effectiveness of Hib conjugate vaccine was noted in Dhaka, Bangladesh, for both Hib and probable cases, suggesting that many probable cases were false-negative Hib cases.

Conclusions

To our knowledge, ours is the first synthesis of disease-burden estimates of bacterial meningitis among under-5 children in South Asia. Few studies were identified, whose estimates were likely underestimates. Alongside highlighting the effectiveness of the Hib conjugate vaccine, our synthesis identifies areas for future research, such as documenting the serotype-specific burden of pneumococcal meningitis in this region.

ESPID-0545

FACTORS ASSOCIATED TO LONG TERM RECOVERY OF CD4 COUNT = 750 CELLS/MCL IN CHILDREN

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Introduction: There is increasing evidence of the benefit of early HAART in children. Nevertheless, factors involved in long term immunological recovery in children have not been elucidated.
Aims: To assess possible factors involved in long-term immune reconstitution in children.
Methods: 109 perinatally HIV infected children on HAART for more than two years with undetectable viral load were included. Recovery was considered as CD4 count ≥ 750 cells/µl by the time of the analysis. The characteristics of the children were assessed based on this threshold. For HIV-infected children less than 5 years old, CD4 percentage ≤25% was considered as the threshold.
Results: Median age of children was 15.4 years (IQR 11.1-17.9) and median of years on HAART were 11.3 (IQR 7.9-13.8). 34 patients started HAART during the first year of life (31.2%). The median nadir of absolute CD4 count and CD4 percentage nadir were 362 cells/µl (IQR 197-563) and 15% (IQR 9.5-22), respectively. Overall, 77 patients (70.6%) had a CD4 nadir < 500 or <25% adjusted to age. Differences in T-cell reconstitution were not associated to the age of initiation, duration or type of HAART (PI or not PI). In multivariate analysis both higher absolute CD4 count and percentage nadir were independently associated with a recovery of CD4 count ≥750 cells/µl on stable HAART. Immunoactivation and immunosenescence were higher in patients with worse immune recovery but not significantly.
Conclusions: Higher CD4 nadir was independently associated with a better long-term immunological recovery in perinatally HIV- infected children with complete virological suppression.

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ESPID-0546

EPIDEMIOLOGY AND SOCIAL/ECONOMICAL BURDEN OF ROTAVIRUS GASTROENTERITIS IN OUTPATIENT SETTING IN RUSSIAN FEDERATION

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EPIDEMIOLOGY AND SOCIAL/ECONOMICAL BURDEN OF ROTAVIRUS GASTROENTERITIS (RVGE) IN THE OUTPATIENT SETTING IN RUSSIAN FEDERATION

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Background: In Russia, there are currently no data about RVGE burden in the outpatient setting. The objective of this study was to characterize the burden among children and parents.
Methods: 510 children ≤ 60 months of age with acute gastroenteritis were enrolled in outpatient clinics across Russia between November 2012-May 2013 (rotavirus season). Stools were tested for RV antigen and serotype. Gasrtoenteritis symptoms, health care utilization, expenses, parental work loss were assessed by questionnaires.
Results: 30,4% (151/497) of tests were RV positive. RVGE cases were more severe than non-RVGE cases (Vesikari score 11,38 vs 8,97, P<0,0001). Daily duration and frequency of symptoms were higher among RVGE cases. Children with RVGE missed 10 days at day care center and parentes missed 4 work days. Parents expenses were higher in RVGE cases than in non-RVGE cases (4022 rubles vs 2760 rubles). RVGE case required average 1,6 visits to outpatient setting and 1,9 visits of pediatrician to child's home. Genotypes were: 39% G4P8; 34% G1P8; 6% G3P8; 6% G9P8; 2% G2P4.
Conclusions: In Russia, RVGE accounts for significant morbidity and burden in the outpatient setting. An effective and well tolerated RV vaccine would be helpful.

ESPID-0547

MOTHER WITH SMEAR-POSITIVE PULMONARY MYCOBACTERIUM TUBERCULOSIS INFECTION IN THE SETTING OF A UK NEONATAL UNIT AND POSTNATAL WARD - MANAGEMENT OF INCIDENT AND NEONATAL CONTACTS

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Introduction: A female prison inmate of Serbian origin, with a background of intravenous drug use delivered a male infant during a five-day inpatient stay. The baby was admitted to the neonatal intensive-care unit (NICU) for neonatal abstinence syndrome where his mother visited him on the open unit on several occasions.

26 days after delivery, the mother was readmitted with a lower-respiratory tract infection. Chest radiograph showed right upper-zone consolidation and cavitation. Sputum microscopy was positive for acid-alcohol-fast bacilli; culture confirmed fully-sensitive *Mycobacterium tuberculosis*.

Management: A multidisciplinary incident meeting was held within 24 hours of maternal diagnosis and extensive contact-tracing undertaken. 'Significant' maternal, neonatal and staff contacts were defined as having had more than 3 hours of contact in the same room as the index case, or extreme close proximity. 22 babies and 1 sibling were deemed to have had some contact, 13 thought to be 'significant'. This included the baby of the index case, who was immediately isolated. The contacts' parents were notified, offered clinic review and chemoprophylaxis (3-month regime of rifampicin and isoniazid) with Mantoux testing thereafter.

Results: All 13 significant were reviewed, took up chemoprophylaxis and underwent follow-up Mantoux testing. The other 10 contacts were not treated but underwent follow-up including testing. There have been no recorded transmission events, including the baby of the index case. Significant parental anxiety was a feature.
Conclusion: Little guidance exists on prophylaxis in such exposure; our limited study suggests a higher threshold may be appropriate but further data would be needed.

ESPID-0548

CAN ULTRASOUND REPLACE RADIOGRAPHY FOR DETECTING PNEUMONIA IN CHILDREN?

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Introduction While CT is the gold standard for chest imaging its expense, availability, and radiation limit its use.

Objective and Aim To determine if portable ultrasonography (US) may be a viable alternative for detecting pediatric pneumonia and more accurate than chest radiography (CXR).

Methods Patients 3 months-18 years over 2 years with a clinically ordered CT or admitted with respiratory conditions were enrolled. Main exposures were chest US and CXR findings read by four clinically blinded radiologists. Main outcome and gold standard was CT findings. Logistic regression generalized estimating equations accounted for multiple raters per patient and was performed for patients with a CT. For patients with no CT, partial gold standard evaluation was estimated using a latent class analysis that included the full dataset to estimate sensitivity and specificity.

Results Of the 37 patients with both US and CXR, 13 (35%) also had chest CTs. Mean age was 4.18 years and 62% were male. When compared directly to CT, US may be more sensitive and less specific in detecting consolidations and pleural effusions than CXR (Table 1). This trend continued in all 37 patients which included children not requiring CT as part of clinical care (Table 2).

Conclusions US and CXR may be statistically equivalent suggesting the potential for US to replace CXR in outpatient and resource-limited settings.

Table 1: Sensitivity and Specificity when Compared with CT Findings (n=13)*

	Ultrasound		CXR	
	Sensitivity	Specificity	Sensitivity	Specificity
Normal	0.60 (0.10, 0.95)	0.56 (0.32, 0.78)	0.63 (0.12, 0.95)	0.48 (0.24, 0.72)
Consolidation	**0.72** (0.50, 0.87)	**0.57** (0.31, 0.80)	**0.65** (0.23, 0.92)	**0.84** (0.56, 0.96)
Pleural Effusion	**1.00** (0.48, 1.00)	**0.62** (0.48, 0.74)	**0.75** (0.39, 0.93)	**0.85** (0.60, 0.96)
Other	0.69 (0.25, 0.94)	0.80 (0.47, 0.95)	0.53 (0.24,0.80)	0.38 (0.16, 0.66)

*Data shown as estimate (95% Confidence Interval)
Note: No statistically significant difference was found between raters in the sensitivity and specificity estimated

Table 2: Partial Gold Standard Evaluation of Sensitivity and Specificity of US and CXR (n=37)*

	Ultrasound		CXR	
	Sensitivity	Specificity	Sensitivity	Specificity
Normal	0.64 (0.01, 0.99)	0.45 (0.19, 0.74)	0.69 (0.01, 0.99)	0.39 (0.16, 0.69)
Consolidation	**0.81** (0.40, 0.97)	**0.62** (0.40, 0.80)	**0.77** (0.32, 0.96)	**0.84** (0.59, 0.95)
Pleural Effusion	**1.00****	**0.68** (0.51, 0.81)	**1.00****	**0.90** (075, 0.97)
Other	0.72 (0.36, 0.92)	0.85 (0.31, 0.99)	0.77 (0.48, 0.93)	0.35 (0.09, 0.73)

* Data shown as estimate (95% Confidence Interval)
**For normal and pleural effusion findings, only 2 of the 37 were assigned to these categories therefore 95% CI could not be accurately estimated

ESPID-0549

COLISTIN ANTIBIOTIC LOCK THERAPY ON MULTIRESISTANT INFECTIONS OF LONG-TERM HICKMAN CENTRAL VENOUS CATHETERS IN PEDIATRIC INTENSIVE CARE PATIENTS

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Introduction: Bacteremias with multiresistant microorganisms is an emerging issue in the Pediatric Intensive Care Unit (PICU). Antibiotic lock therapy (ALT), with or without concomitant systemic drug administration, is an acceptable technique for the salvage of long-term central venous catheters (cvcs), in PICU patients. However, experience with colistin ALT in children is limited.

Aims: To present our experience with colistin ALT of long-term Hickman catheters.

Methods: ALT was performed with infusion of 4 ml colistin without heparin, at a concentration of 0.8 mg/ml in each lumen, and lock duration was 12 hours daily.

Results: During a three years period, among 38 patients with Hickman catheters, 5 episodes of bacteremias with multiresistant microorganisms were treated with colistin ALT. Catheter, infection and treatment characteristics are shown in table 1. No complication related to ALT was reported.

Table 1.

	Lumen	Pathogen	MDR	Hickman days to bacteremia	ALT duration	Colistin systemic	Eradication	Outcome
1	2	Klebsiella ssp.	Yes	3	15	Yes	Yes	Alive
2a*	2	A. baumanii	Yes	130	15	Yes	Yes	Alive
2b*	2	A. baumanii	Yes	385	15	No	Yes	Alive
3	1	P. aeruginosa	Yes	24	15	Yes	Yes	Alive
5	1	A. baumanii	Yes	7	3	Yes	No[#]	Dead

MDR; multi drug resistance, ALT; antibiotic lock therapy, *same patient, different cvcs, [#] secondary bacteremia

Conclusions: Colistin ALT is a safe technique that leads to high rates of infection eradication and should be considered as an option in primary bacteremias with multiresistant pathogens in PICU patients with long-term cvcs.

ESPID-0550

COMPARATIVE INVESTIGATION OF PLASMODIUM SPECIES AMONG CHILDRENS IN KARACHI-PAKISTAN

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Background and Aims

Malaria is dangerous and universal parasitic disease among tuberculosis, dengue, HIV and AIDS, about 2 million annual deaths are reportd especially in African countries whereas international scientist trying to eradicate and it from the world. In Pakistan Malaria is unstable and it transmit during postmoon soon periods, the major causative agents are *Plasmodium falciparum* and *P.vivax* whereas *Anphelese stephensi* and *Anopheles culicifacies* are main vectors of malaria.

Methods

Blood was collected from 659 volunteer's children below two years from five districts of Karachi having symptoms of high chill fever, headache and vomiting etc. The performa was provided to the parents and filled at the time of survey included name, age, sex, previous health, patient temperature, symptoms and complications with details about the diets were also noted. Fifty one slides out of 659 Giemsa stained slides were positive for malaria by microscopic examination.

Results

The comparative study based on the investigation of blood specimen of childrens**,** out of 659 children of different gender, infection of *Plasmodium falciparum* were found seventeen (8.76%), fourteen (8.59%), six (56.93%) while *Plasmodium vivax* were infected fourteen (11.02%), four (1.98%) and five (1.45%) were identified during 2002. 2003 and 2004 respectively.

Conclusions

These results suggest that transmission of both *P. vivax* and *P. falciparum* occurs more or less in equal percentages among below two years of children during three years of comparative studies.

ESPID-0551

URINE IS MORE SENSITIVE THAN SALIVA WHEN SCREENING FOR POSTNATAL CMV INFECTIONS OF PRETERM INFANTS

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Introduction:

Cytomegalovirus (CMV) is the most frequently contracted virus in preterm infants and infection is sometimes associated with severe disease. To diagnose an infection, urine or saliva samples are tested for CMV DNA by polymerase chain reaction (PCR). Although the diagnostic accuracy of testing saliva samples has not been determined in preterm infants, saliva is widely used because it is easier to obtain than urine.

Aim:

We conducted a study to determine if screening of saliva is equivalent to urine to detect postnatal CMV infections.

Methods:

Between 2010 and 2013 saliva and urine samples were collected from infants that were admitted to the neonatal ICU of the University Medical Center Utrecht and that were born before 32 weeks gestational age (GA). Urine samples were obtained within three weeks after birth and saliva and urine samples at term equivalent age (40 weeks GA) and tested for CMV DNA by real-time PCR. Infants with a congenital CMV infection were excluded.

Results:

Of 264 preterm infants included in the study, CMV DNA was detected in urine of 47 and in saliva of 43 children. Of 47 infants with CMV infection, CMV was detected in 42 saliva samples (sensitivity 89.4%; CI 80.5-98.2). Of 217 children without CMV, one saliva sample tested positive for CMV (specificity 99.5%; CI 98.6-100).

Conclusion:

Screening saliva for CMV DNA is inferior to urine to diagnose postnatal CMV infections in preterm infants.

ESPID-0552

INTER-OBSERVER AGREEMENT IN ASSESSING RADIOLOGICALLY THE EXTENT AND SIDE OF PULMONARY COMPROMISING AMONG CHILDREN WITH NON-SEVERE COMMUNITY-ACQUIRED PNEUMONIA

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Aim: To evaluate the agreement between two pediatric radiologists in assessing radiologically the extent and side of pulmonary compromising among children with non-severe community-acquired pneumonia (CAP).

Methods: We conducted a prospective study in Salvador, Brazil, from November/2006 to April /2011. Children aged 2-59 months with non-severe CAP and chest x-ray (CXR) (frontal and lateral views) taken to search for CAP were evaluated. Radiologically-confirmed pneumonia was diagnosed if there was agreement between two radiologists, blinded to clinical data, on the presence of pulmonary infiltrate or pleural effusion. Each finding was localized as right or left side as well as upper or lower lobe. Kappa index was calculated to evaluate their concordance on the extent and side of pulmonary compromising.

Results: Out of 803 evaluated cases, the radiologists agreed that 774 (96.4%) and 3 (0.4%) CXR were appropriate or inappropriate for reading, respectively, and that 222 (28.7%) and 459 (59.3%) CXR presented or did not present pneumonia. Among the 222 cases with concordant pneumonia, consolidation (94% and 88%) and alveolar infiltrate (92% and 64%) were the most frequent radiological findings per radiologist 1 and 2, respectively. Kappa index was higher for alveolar infiltrate localized on the upper right (kappa=0.639; concordance 88%), lower left (kappa=0.462; concordance 81%) and lower right (kappa=0.407; concordance 73%) lobes. Concordance on 1 or 2 compromised lobes was 85% and the respective kappa was 0.285.

Conclusion: Detection of alveolar infiltrate on the upper-right lobe is the easiest radiological finding to be detected among children with non-severe radiologically-confirmed CAP.

ESPID-0553

MORTALITY IN CHILDREN AND ADOLESCENTS VERTICALLY INFECTED BY HIV RECEIVING CARE AT A REFERRAL HOSPITAL IN VITÓRIA, BRAZIL.

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Background: Late diagnosis, risk factors for death, and mortality trends were evaluated in vertically HIV-infected children. ***Methods:*** A retrospective 11-year study was conducted with Brazilian vertically HIV-infected children and adolescents using patients' charts. Medical records, death certificates and the Ministry of Health's mortality database were verified for mortality and cause of death. Diagnoses were made according to the CDC Revised Classification System for HIV infection. ***Results:*** Of 177 patients included, 97 were female (54.8%). Median age at admission was 30 months (IQR: 5-72 months). Median follow-up was 5 years (IQR: 2-8 years). After 11 years, 134 patients (75.7%) continued in follow-up, 11 (6.2%) had been transferred and 8 (4.5%) were lost to follow-up. Twenty-six deaths occurred (14.7%), the majority (16/26; 61.5%) in children <3 years of age. Cases decreased over time and the distribution of deaths was homogenous over the years of evaluation. In 17/25 (68%) of the children who died, diagnosis had been made as the result of their becoming ill. Beginning antiretroviral therapy before 6 months of age was associated with being alive (OR=2.86; 95%CI: 1.12-7.25; p=0.027). The principal causes of death were severe bacterial infections (12/21; 57%) and opportunistic infections (7/21; 33.3%). ***Conclusions:*** In most of the HIV-infected children, diagnosis was late, increasing the risk of progression to AIDS and death due to delayed treatment. The mortality trend was constant, decreasing in the final two years of the study. Bacterial infections remain as the major cause of death. Improvements in prenatal care and pediatric monitoring are mandatory.

ESPID-0554

SCREENING FOR EARLY ONSET NEONATAL GBS INFECTION. IS A LESS INVASIVE APPROACH FEASIBLE?

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Recent recommendations for the management of asymptomatic term infants with septic risk factors for Group B Streptococcal (GBS) sepsis have advised a more clinical and less invasive approach.

A previous audit in 2011 in our unit showed that large numbers of unnecessary septic evaluations were being performed and antibiotics given to asymptomatic infants with one septic risk factor, while the majority of actual GBS positive sepsis infants had no known septic risk factors. From this, a new protocol for evaluating term infants with septic risk factors was introduced, which emphasized the importance of frequent clinical examination.

This study was a re-audit to complete the audit cycle from 2011. The aim of the study was to assess the efficacy of this new protocol. The objectives were to investigate its safety and its economic savings. 1855 infant charts from the first 3 month period after the protocol was introduced in 2012 were reviewed by 2 independent investigators. The comparative standards used were the 2010 CDC recommendations[1].

There was a significant reduction (19% to 4.5%) in the percentage of term infants who underwent septic evaluations and potentially unnecessary antibiotics compared to 2011. The new protocol was calculated to have saved the department at least E11,500 in the 3 month period due to the reduced number of on call blood tests that needed to be analyzed, equating to savings of E50,000 per year.

No known cases of sepsis were missed or delays in diagnosis identified with this new protocol.

ESPID-0555

DIPHTHERIA IS STILL SEEN DISEASE IN LITHUANIA AND LATVIA

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Background: Decline of vaccination coverage in the past decade led to increase of susceptible population. Level of circulating of diphtheria causative organism in different population is unknown.

Aim: to characterize the risk of re-emergence of diphtheria in Lithuania and Latvia.

Methods: National surveillance data during period 1991-2012 were used. Screening was done as part of multicentre 10 countries study "*Corynebacterium diphtheriae* and *Corynebacterium ulcerans* in patients with upper respiratory tract infections 2007-2008". 2988 throat swabs in Lithuania and 2480 in Latvia were tested. All isolates were sent to HPA(UK) for ribotyping.

Results: In 1990s incidence of diphtheria increased to epidemic level, with peak in 1994-1995. Incidence rate in Latvia was 9.9 per 100,000 (250 cases) in 1994 and 14.8 (369 cases) in 1995, in Lithuania - 1.0 (38 cases) and 1.2 (43 cases) respectively. Vaccination campaigns for adults were performed in 1996-1997. Sporadic diphtheria cases occurred in Lithuania in postepidemic period. Latvia remained the country reporting highest incidence rate in Europe. During screening study 4 toxigenic *C.diphtheriae* strains were isolated (carriage rate 1.3 per 1000) in Lithuania, 2 in Latvia (0.8). 5 typed isolates were biotype gravis, ribotype Sankt-Petersburg (4 in Lithuania, 1 in Latvia). Vaccination coverage (DTP3) slightly decreased during few past years: from 98.0 (2007) to 94.0 (2011) percent in Latvia, and respectively – from 95.0 to 92.0 in Lithuania.

Conclusion: Surveillance and screening study data in Lithuania and Latvia demonstrate the remained threat of diphtheria. Immunization activities (among children and adults) and good quality surveillance are essential.

ESPID-0556

PERSISTENCE OF THE IMMUNE RESPONSE TO ROUTINE INFANT IMMUNISATIONS ADMINISTERED IN CONSISTENT VERSUS DIFFERENT LIMBS

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Background: In routine immunisation programmes, sequential doses of a vaccine may be given in different limbs, a practice that was shown to result in reduced immunogenicity with an intradermal rabies vaccine. This study assessed if this also occurred with routine infant vaccination. In a preliminary analysis of this study (2013), different (alternating) limb vaccination resulted in significantly higher anti-PRP [anti-polyribosylribitol (Hib)] IgG geometric mean concentrations (GMCs) when compared with consistent (same) limb vaccination after a 3-dose DTaP-IPV-Hib priming schedule, but not after Hib-MenC-TT boosting. Anti-pneumococcal IgG GMCs were similar for both groups. We report on antibody persistence at 24 months, one year after boosting.

Methods: 509 participants were randomised 1:1 to receive DTaP-IPV-Hib at 2, 3 and 4 months and PCV-13 at 2, 4 and 12 months in either consistent (CL) or different (DL) limbs. They also received either zero, one or two priming doses of a serogroup C meningococcal conjugate vaccine and a Hib-Men C-TT booster at 12 months. Serum IgG GMCs against PRP and 13-valent pneumococcal conjugate vaccine (PCV13) serotypes were compared at 24 months.

Results: Anti-PRP IgG GMCs were similar for both groups: 2.46µg/ml (95%CI: 2.02-3.00) (CL) vs. 2.65µg/ml (95%CI: 2.16-3.24) (DL) [p=0.73]. No differences were seen for PCV13 IgG GMCs.

Conclusion: Administration of sequential doses of routine infant vaccines in different limbs does not result in reduced immunogenicity. Immunisation programmes do not need to specify whether consistent or different limbs should be used in schedules that contain multiple doses of the same vaccine.

ESPID-0557

SAFETY AND IMMUNOGENICITY OF AN INVESTIGATIONAL MENINGOCOCCAL SEROGROUP B BIVALENT RLP2086 VACCINE IN HEALTHY ADOLESCENTS

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Background and Aims: *Neisseria meningitidis* serogroup B (MnB) causes invasive disease in infants, adolescents, and adults. A conserved, surface-exposed lipoprotein, LP2086 (a factor H binding protein [fHBP]), is a promising MnB vaccine target. Safety and immunogenicity of an investigational bivalent, recombinant vaccine (rLP2086) were studied in healthy adolescents (11-18 years).

Methods: Subjects in this placebo-controlled, single-blind study were randomized to two 3-dose schedules and three 2-dose schedules. Each 120-µg dose contained two rLP2086 antigens, one from each LP2086 subfamily (A and B). Saline was given when vaccine was not scheduled. Serum bactericidal assays using human complement (hSBA) were performed with four MnB test strains heterologous to vaccine fHBP.

Results: 1713 subjects (mean age, 14.4 y) were randomized. One month after three doses of vaccine, hSBA titers ≥8 to subfamily A and B strains were observed in 92-99% and 86-89% of subjects, respectively; after 2 doses, these numbers ranged from 91-100% and 69-81% of subjects, respectively. Of the 2-dose schedules, 0 and 6 months induced the highest antibody responses (Table 1). hSBA GMTs after 2 doses ranged from 14.7-125.6 and after 3 doses ranged from 25.6-155.6 across the 4 MnB heterologous test strains. Mild-to-moderate injection site pain was the most common local reaction. Fever ≥38ºC was experienced in 3.3-6.5% and 2.1% of rLP2086 and saline recipients, respectively, after first injection

Table 1. Proportion of Subjects Achieving hSBA Titer ≥8* for Each Strain 1 Month After Last Dose of Bivalent rLP2086

Strain [fHBP variant]	Group 1 (0, 1, 6 mo) n=329–363 % (95% CI)†	Group 2 (0, 2, 6 mo) n=329–359 % (95% CI)†	Group 3 (0, 6 mo) n=320–370 % (95% CI)†	Group 4 (0, 2 mo) n=234–240 % (95% CI)†	Group 5 (2, 6 mo) n=102–113 % (95% CI)†
PMB80 [A22]	91.7‡ (88.3, 94.3)	95.0‡ (92.1, 97.0)	93.5‡ (90.5, 95.8)	90.8 (86.3, 94.1)	91.9 (85.2, 96.2)
PMB2001 [A56]	99.4‡ (98.0, 99.9)	98.9‡ (97.2, 99.7)	98.4‡ (96.5, 99.4)	100.0 (98.5, 100.0)	99.1 (95.2, 100.0)
PMB2948 [B24]	89.0‡ (85.2, 92.0)	88.4‡ (84.6, 91.6)	81.1‡ (76.6, 85.0)	73.0 (66.9, 78.5)	69.1 (59.6, 77.6)
PMB2707 [B44]	88.5‡ (84.7, 91.6)	86.1‡ (82.0, 89.5)	77.5‡ (72.8, 81.8)	70.1 (63.8, 75.9)	73.0 (63.7, 81.0)

hSBA = serum bactericidal assay using human complement.

*Lower limit of quantification for all strains=8.

†Exact 2-sided confidence interval (Clopper and Pearson) based upon the observed proportion of subjects.

‡$P<0.001$; values <0.0125 are considered significant. *P* values only apply to Groups 1, 2, and 3.

Table 2. hSBA GMTs for Each Strain 1 Month After Last Dose of Bivalent rLP2086

Strain [fHBP variant]	Group 1 (0, 1, 6 mo) n=329–363 GMT* (95% CI)†	Group 2 (0, 2, 6 mo) n=329–359 GMT* (95% CI)†	Group 3 (0, 6 mo) n=320–370 GMT* (95% CI)†	Group 4 (0, 2 mo) n=234–240 GMT* (95% CI)†	Group 5 (2, 6 mo) n=102–113 GMT* (95% CI)†
PMB80 [A22]	55.1 (48.87, 62.07)	56.3 (50.91, 62.27)	48.4 (43.45, 53.86)	37.1 (32.23, 42.76)	39.6 (32.31, 48.46)
PMB2001 [A56]	152.9 (137.23, 170.47)	155.6 (140.39, 172.38)	125.6 (112.59, 140.17)	104.9 (93.16, 118.05)	111.8 (92.73, 134.90)
PMB2948 [B24]	29.1 (25.88, 32.66)	25.6 (23.03, 28.45)	20.6 (18.38, 23.18)	17.7 (15.24, 20.49)	14.7 (12.01, 18.10)
PMB2707 [B44]	40.3 (35.16, 46.11)	35.0 (30.63, 39.91)	22.5 (19.60, 25.72)	19.1 (16.03, 22.78)	17.8 (14.12, 22.42)

GMT = geometric mean titer; hSBA = serum bactericidal assay using human complement.

*GMTs were calculated using all subjects with valid and determinate hSBA titers at the given time point.

†CIs are back transformations of confidence levels based on the Student t distribution for the mean logarithm of the hSBA titers.

Conclusions: rLP2086 was well tolerated. All dosing regimens yielded robust bactericidal responses that were most pronounced after three doses.

Funded by Pfizer Inc.

ESPID-0558

CONGENITAL SYPHILIS: A MODERN DAY PERSPECTIVE

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Background

Congenital syphilis is caused by vertical transmission of the spirochete bacterium Treponema pallidum (1). There is evidence that syphilis is a re-emerging issue in many areas.(2)

National and regional protocols are in place for management, however many clinicians are unfamiliar with the disease.(1&3)

Aims & Objectives

In a District General Hospital, an audit was undertaken to review clinical practice against a regional guideline

Methods

An audit proforma was designed, with standards from the regional guideline. The case notes of infants born to mothers with an antenatal diagnosis of syphilis, in a 6 month period, were reviewed by a single auditor

Results.

8 infants were identified. All 8 mothers were felt to have latent/previously treated syphilis, they were all foreign nationals. Difficulties arose due to the lack of old notes from other countries, lack of documentation of treatment or post treatment bloods, separate notes, and different locations of patient visits. In light of this, the antenatal treatment plans for paediatrics were not complete.

Issues around patient safety in the care of the newborn we demonstrated, including no documentation of double checking medications, unsatisfactory follow up and two clinical incidents were reported regarding administration of intramuscular Benzathine Penicillin

Conclusion

The audit was presented locally and regionally and encouraged a regional review of the guideline. To tackle the patient safety issues, communication between the teams will be strengthened, along with the development of an outreach paediatric infectious disease clinic. On-going education will be provided for staff.

ESPID-0559

RANDOMIZED, PLACEBO-CONTROLLED, PHASE 2 STUDY OF THE IMMUNOGENICITY AND SAFETY OF REPEVAX® ADMINISTERED CONCOMITANTLY WITH BIVALENT RLP2086 VACCINE IN HEALTHY ADOLESCENTS

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Background/Aims: The investigational bivalent rLP2086 vaccine, being developed to prevent *Neisseria meningitidis* serogroup B (MnB) disease in adolescents, was evaluated with concomitant administration of Repevax®, a dTaP-inactivated polio vaccine currently used in this population.

Methods: Adolescents, randomized 1:1 to Repevax+rLP2086 or Repevax+saline were vaccinated at 0, 2, and 6 months. The proportion of subjects achieving prespecified antibody levels to 9 Repevax antigens 30 days after initial vaccination were determined. Immune responses (hSBA) to 4 MnB test strains were measured 30 days after vaccinations 2 and 3. Adverse events (AE) and local/systemic reactions were assessed.

Results: Of 749 subjects randomized, 685 (91.5%) comprised the evaluable immunogenicity population. Immune responses following Repevax+rLP2086 or Repevax+saline were noninferior for all 9 Repevax antigens. Immune responses to the bivalent rLP2086 vaccine were substantial after 2 doses and further enhanced after 3 doses (Table). Mild-to-moderate injection site pain was the most common local reaction; headache and fatigue were the most common systemic events. The proportion of subjects reporting an AE within 30 days postvaccination was similar (8.8% and 11.4%, for Repevax+rLP2086 and Repevax+saline, respectively).

Table. Immune response to 4 heterologous MnB test strains after doses 2 and 3 of bivalent rLP2086

Strain [fHBP variant]	rLP2086 + Repevax				Saline + Repevax			
			hSBA ≥ LLOQ				hSBA ≥ LLOQ	
Time point	N[a]	hSBA GMT (95% CI)[c]	n[b] (%)	(95% CI)[d]	N[a]	hSBA GMT (95% CI)[c]	n[b] (%)	(95% CI)[d]
PMB80 [A22]								
Dose 2	154	35.5 (30.27, 41.61)	126 (81.8)	(74.8, 87.6)	166	11.2 (10.02, 12.46)	36 (21.7)	(15.7, 28.7)
Dose 3	158	63.4 (55.29, 72.79)	151 (95.6)	(91.1, 98.2)	166	11.0 (9.92, 12.27)	33 (19.9)	(14.1, 26.8)
PMB2001 [A56]								
Dose 2	149	91.1 (78.00, 106.51)	145 (97.3)	(93.3, 99.3)	151	8.3 (6.76, 10.29)	39 (25.8)	(19.1, 33.6)
Dose 3	148	151.5 (131.47, 174.59)	148 (100.0)	(97.5, 100.0)	152	8.5 (6.90, 10.54)	40 (26.3)	(19.5, 34.1)
PMB2948 [B24]								
Dose 2	153	15.9 (13.55, 18.55)	124 (81.0)	(73.9, 86.9)	167	4.8 (4.41, 5.19)	20 (12.0)	(7.5, 17.9)
Dose 3	157	28.3 (24.49, 32.66)	152 (96.8)	(92.7, 99.0)	170	4.8 (4.41, 5.15)	22 (12.9)	(8.3, 18.9)
PMB2707 [B44]								
Dose 2	146	14.6 (11.6, 18.43)	81 (55.5)	(47.0, 63.7)	159	4.7 (4.24, 5.12)	12 (7.5)	(4.0, 12.6)
Dose 3	146	36.5 (28.93, 46.18)	119 (81.5)	(74.2, 87.4)	159	4.7 (4.29, 5.24)	13 (8.2)	(4.4, 13.6)

GMT=geometric mean titer; hSBA= serum bactericidal assay using human complement; LLOQ= lower limit of quantitation (titer 1:16 for PMB80 [A22] and 1:8 for the other MnB test strains); rLP2086=recombinant lipoprotein 2086.

[a]Number of subjects with valid hSBA titers for the given strain

[b]Number of subjects with hSBA titer ≥LLOQ for given strain at specified time point

[c]Confidence intervals are back transformations of confidence intervals based on Student *t* distribution for the mean logarithm of the hSBA titers

[d]Exact 2-sided confidence intervals based on observed proportion of subjects using the Clopper and Pearson method

Conclusions: When given concomitantly with bivalent rLP2086, Repevax induced immune responses that were noninferior to those elicited by Repevax alone. The bivalent rLP2086 vaccine induced robust bactericidal responses to four diverse MnB test strains, particularly to those representing subfamily B, that were greater after 3 doses than 2 doses. Concomitant administration was generally safe and well tolerated.

Funded by Pfizer Inc.

ESPID-0561

ANTIBIOTIC SURVEILLANCE IN A DEPARTMENT OF NEONATOLOGY

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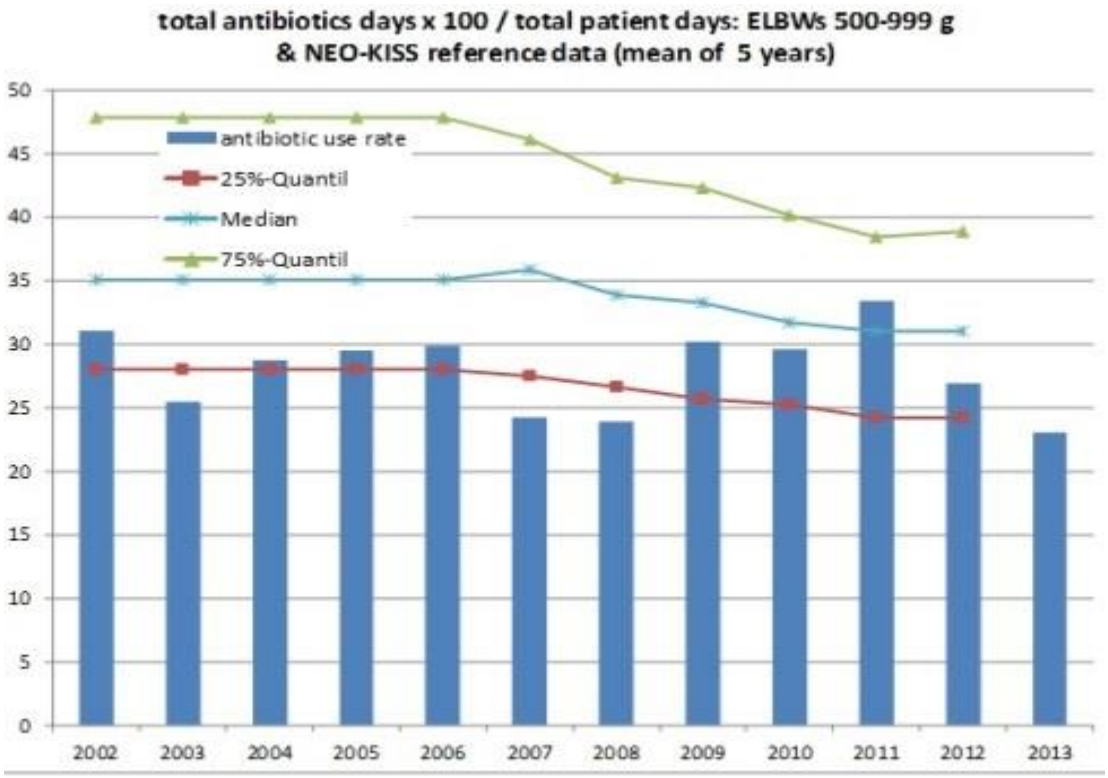
Background: NEO-KISS is a national surveillance system in Germany, established in 2000. Since 2002 our Department of Neonatology participates in the surveillance of antibiotic usage. Since 2011 antibiotic stewardship is mandatory in Germany (§ 23 IV Infection Protection Act 'IfSG'). Defined daily doses (DDD)/1000 patient days are the legal standard methodology.
Aims: We questioned the meaningfulness of DDDs in Paediatrics, with our NICU as an example.
Methods: We compare the rate of days on antibiotic therapy documented in NEO-KISS in the years 2002 – 2013 (including all VLBW-infants on a patient-by-patient basis) — 'representative' of all infants on the ward — with the pharmaceutical quantities (bottles) of antibiotics delivered by our pharmacy (unit-based quantification) in the years 2008 - 2013.
Results: After changing the ampoules standing time the ordered amounts increased significantly, partially more than twofold. Until 2012 ampoules were used on the ward as long as approved by the manufacturer, max. 24 hours. In 2013 all drugs were discarded one hour after first use. The antibiotic use rate among VLBW infants (under NEO-KISS surveillance) changed little.
Conclusions: In addition to calculations on the basis of delivered quantities, antibiotics utilization rates (total antibiotics days x 100 / total patient days) are an important reference. Ideally, all specific indications should be documented in this context.


total antibiotics days x 100 / total patient days: ELBWs 500-999 g
& NEO-KISS reference data (mean of 5 years)
antibiotic use rate
25%-Quantil
Median
75%-Quantil
50
45
40
35
30
25
20
15
10
5
0
2002
2003
2004
2005
2006
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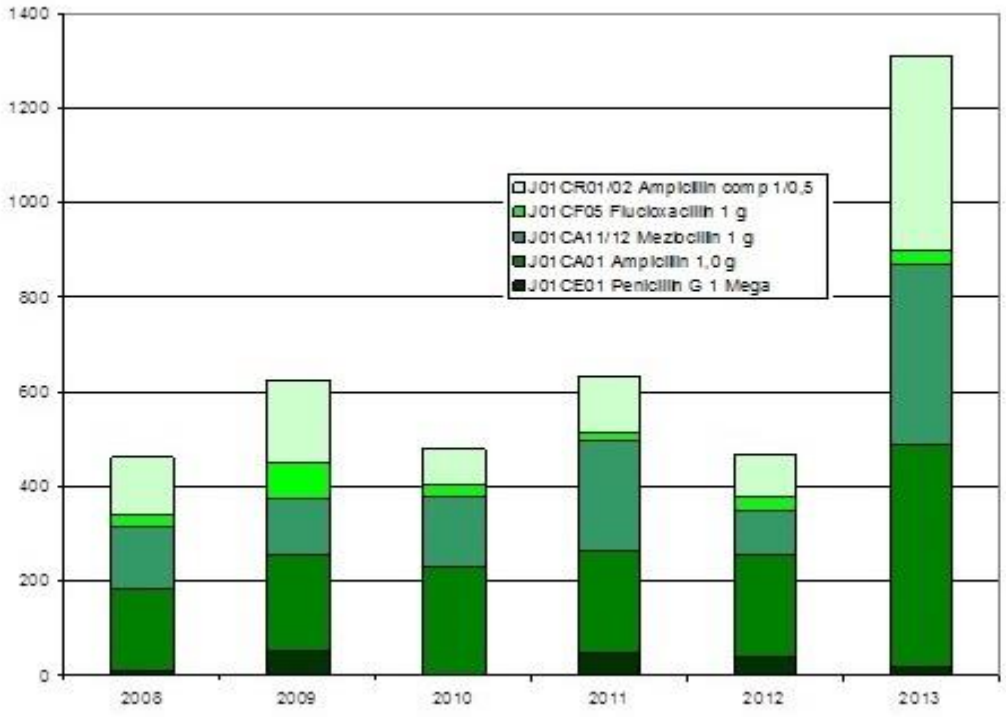
2012
2013


J01CR01/02 Ampicillin comp 1/0,5
J01CF05 Flucloxacillin 1 g
J01CA11/12 Mezlocillin 1 g
J01CA01 Ampicillin 1,0 g
J01CE01 Penicillin G 1 Mega
1400
1200
1000
800
600
400
200
0
2008
2009
2010
2011
2012
2013

ESPID-0562

CASE OF HIGH GRADE EBV INFECTION IN 2 YEAR OLD GIRL POST LIVER RETRANSPLANTATION

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Case of high grade EBV infection in 2 year old girl post liver retransplantation.

EBV associated lymphoproliferative disorders (PTLD) are a heterogeneous group of potentially life-threatening complications that occur after solid organ and bone marrow transplantation. In the settings of immunosuppression they occur as a result of abnormal proliferation of EBV infected B cells. In normal settings this is controlled by EBV specific cytotoxic T cells. Epstein–Barr (EBV) viral load monitoring using polymerase chain reaction (PCR) has been reported to have a variable sensitively with relatively higher specificity, which allows identifying the high risk patients. The diagnosis of EBV associated lymphoproliferative disorders should be based on clinical picture, specific histology and immunology findings. Treatment options include reduction of immunosuppression , or stopping, aiming optimal balance between abnormal proliferation of EBV infected B cells and EBV specific cytotoxic T lymphocytes, monoclonal antibody against CD20, and/or chemotherapy and continuous intravenous immunoglobulin infusions. We present a case of high grade EBV infection in 2 years old girl with biliary atresia post liver retransplantation / she lost the first liver graft due to hepatic artery thrombosis/. Six months post split liver retransplantation the girl had recurrent episodes of high grade fever, abdominal pain, bloody diarrhoea, anemia, hypoproteinemia, anorexia, weight loss, malaise, high grade EBV PCR. Clinical presentation, lab tests results, and the findings from upper GI endoscopy and colonoscopy along with GI histology were consistent with high grade EBV GI infection, which has been successfully treated by Rituximab 10mg/kg weekly for 4 weeks, followed by intravenous immunoglobulin infusions for 12 months. 30 months after stopping the treatment the girl is well, she has normal physical and neurological development, with no evidence of clinical, histological and immunological signs of active EBV infection with low EBV viral load.

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ESPID-0563

BK VIRUS: IN PAEDIATRIC NEPHROLOGY AND HAEMATOLOGY-ONCOLOGY

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Background
BK virus a member of the polyomavirus family. Whilst infection with the BK virus is not uncommon, infections will likely pass unnoticed in the immunocompetent host. Following primary infection the virus lies latent at a variety of sites, most commonly in the urinary tract3. In the immunocompromised, the virus can become reactivated and replicate
Aims & Objectives
This review will compare and contrast the presentation of BK virus reactivation in Paediatric Nephrology and Haematology- Oncology.
Methods
Detailed case reviews of four patients with BK virus in the renal group and four patients in haematology-oncology group.
Results
The four cases in the nephrology group showed BK nephropathy post renal transplant, which responded to medication adjustment. In this group, significant BK viraemia was demonstrated
The four haematology-oncology cases included 3 cases of haemorrhagic cystitis in children undergoing chemotherapy for ALL/ Lymphoma and one case of a child post liver transplant for hepatoblastoma, who presented with haemorrhagic cystitis and nephropathy.
In this group, significant BK viruria was demonstrated but no viraemia
Conclusions
Both patient groups, have documented reactivation of BK virus and significant viraemia/viruria, but identical symptomatology following reactivation is not observed. The renal cohort did not develop haemorrhagic cystitis and conversely the 3 out of the 4 oncology cohort, with haematological malignancies, did not develop BK-mediated nephropathy. Interestingly, our oncology cohort included a child post liver transplant, whose presentation showed similarities to both cohorts.

ESPID-0564

ERYTHEMA NODOSUM, AN ETIOLOGIC CHALLENGE

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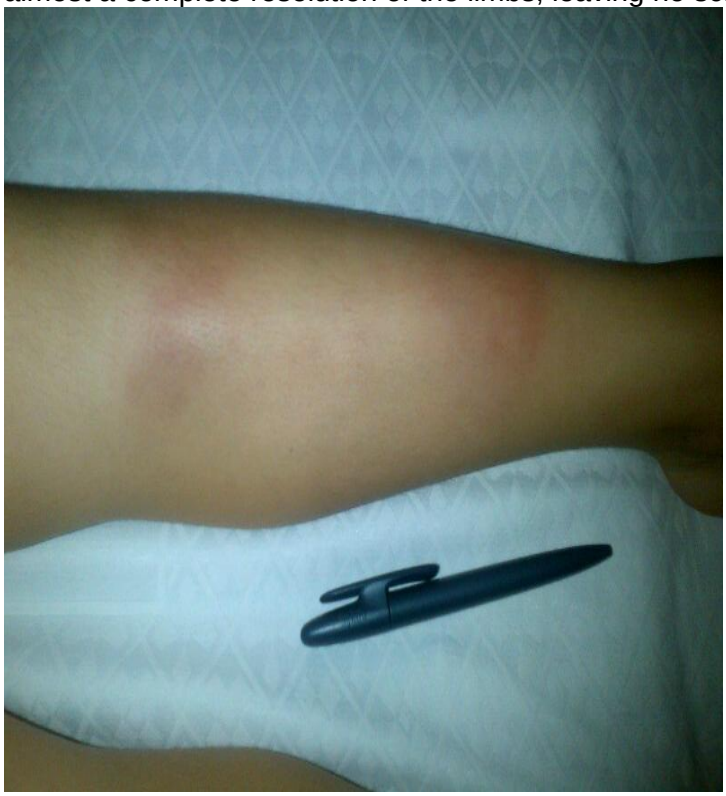
Introdution

Erythema nodosum may be the first sign of a systemic disease such as tuberculosis, a reaction to certain drugs, a bacterial infection, and a variety of other disorders, but usually it is idiopathic.

Case Report

We present a case of an eight years old boy, previously healthy, that came to the Emergency Department with recent onset of fever (one day) and tender, erythematous subcutaneous nodules located on the anterior surface of the left lower extremity (pretibial), without other symptoms. Erythema nodosum was diagnosed and the patient was treated with bed rest and nonsteroidal anti-inflammatory drugs. On the first week, he developed contralateral nodules, but after 2 weeks there was almost a complete resolution of the limbs, leaving no scars.



The etiologic investigation (revealed analytic results within the normal range except erythrocyte sedimentation rate 79mm/h, C-reactive protein 137 mg/L and the culture of stool tested positive for *Yersinia enterocolitica.* Although there was no previous

history of prior gastroenteritis there was a reference of eating wild blueberries without prior washing one week earlier.

Conclusions

This case emphasizes the importance of a good anamneses and careful physical examination to determine a diagnosis that is essentially clinical. Despite that, in a patient with erythema nodosum, the etiological investigation should be extensive and probably should include stool culture, with the aim of identifying any underlying pathology.

ESPID-0566

APPROACHES OF RESIDENTS OF DIFFERENT SPECIALTIES TO ACUTE PHARYNGITIS

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Introduction: Acute pharyngitis is a frequently encountered infectious disease of childhood.

Objectives: To find out diagnostic and therapeutic approaches by physicians to childhood acute pharyngitis (AP) and possible differences among specialties.

Aims: Draw conclusions for residency training programs

Methods: A total of 166 residents [93 paediatrics and child health (PACH), 38 otolaryngology (OL), and 35 family medicine (FM)] in Ankara, Turkey were interviewed. After the description of an imaginary, complication-free paediatric case with acute pharyngitis case to the residents, various questions were asked.

Results: Otolaryngology residents tend to order less laboratory tests than PACH and FM residents do. Of those who will prescribe antibiotics, all of the OL (36/36) and the majority (55/87 and 28/34, respectively) of PACH and FM residents chose to give antibiotic(s) without ordering or waiting for the result of a throat culture. The most popular antimicrobial regimen [by 25 (15.1%) residents] was intramuscular procaine penicillin for 5-10 days, while the recommended drugs of choice, benzathin penicillin or penicillin V, were preferred by 17 (10.2%) and 10 (6.0%) residents, respectively. One hundred four (62.7%) residents supported the idea of taking throat cultures on a regular basis from all children attending day-care centers. Ten residents did not agree that acute rheumatic fever could be prevented with appropriate treatment of streptococcal acute pharyngitis. Fourteen (8.4%) physicians recommended prophylactic antibiotic(s) to a child after his first acute streptococcal pharyngitis.

Conclusions: The results above call for urgent and effective educational measures in specialty training programs.

ESPID-0567

ANTIBODIES ENHANCE THE INNATE AND ADAPTIVE IMMUNE RESPONSE TO RESPIRATORY SYNCYTIAL VIRUS INFECTION IN ADULT AND NEONATAL IMMUNE CELLS

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Respiratory syncytial virus (RSV) bronchiolitis is a major burden in infants below 6 months. The immune system of newborns is largely dependent on innate immunity and protection by maternal antibodies. How these antibodies and innate immune system interact during RSV infections in infants is not known.

Primary human immune cells (PBMCs) were stimulated with RSV, inactivated RSV, human serum (HS) and antibody depleted HS. Infection rate, cytokine production and a microarray were analyzed.

Results from the microarray on stimulated adult PBMCs suggested that the presence of antibodies enhances the type I IFN pathway (specifically IFNα) and the innate cytokine response (specifically CXCL10). These results were confirmed by ELISA on the supernatant. The presence of antibodies enhances both IFNα and CXCL10 production, which was independent of viral replication as inactivated RSV showed the same phenotype. Antibodies also enhance the CXCL10 production in neonatal PBMCs in response to an RSV infection. The antibodies present in HS prevent RSV from infecting cells in a dose-dependent manner. Despite this reduction in infection, an antibody-dependent enhancement of the adaptive cytokine IFN-γ was seen. This IFN-γ was likely produced by memory T-cells as newborn PBMCs did not show an IFN-γ response.

Our data show that antibodies are able to enhance both innate and adaptive cytokines. The enhancement of the innate cytokine CXCL10 is also seen in neonatal PBMCs. CXCL10 is a chemo-attractant and antibodies could therefore play an important role in attraction of immune cells to the site of infection and possibly enhance disease severity.

ESPID-0568

A HOSPITAL-BASED STUDY OF COMMUNITY-ACQUIRED STAPHYLOCOCCUS AUREUS PNEUMONIA AMONG CHILDREN: EPIDEMIOLOGY, TREATMENT AND OUTCOME (2007-2012)

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BACKROUND AND AIMS: To evaluate the epidemiologic, clinical and microbiological characteristics of community-acquired *Staphylococcus aureus* pneumonia (CA-SA) in a tertiary pediatric hospital in Athens.

METHODS: Patients with culture proven CA-SA pneumonia were identified from the LIS and medical records were reviewed. Susceptibility to antimicrobials was tested with disc diffusion method (CLSI guidelines). MICs of vancomycin (VA), teicoplanin (TEC) and linezolid (LIN) were determined by Etest®.

RESULTS: In total, 15 cases of CA-SA pneumonia were recorded in children (boys 60%) aged from 30 days to 11 years (median, 9 months). MRSA accounted for 12/15 (80%) cases. Clinical manifestations were parapneumonic effusion (15), pneumothorax (3), abscess (1). SA was isolated from pleural fluid (11 cases), pleural fluid and blood (1), bronchial aspirate (2), and blood (1). Median WBC and CRP upon admission were 25400/μl (range 900-32900/μl) and 218mg/l (99-327mg/l). Hospitalization ranged from 3-37days (median 17). Drainage was performed in 13 cases, whereas 7 children needed ICU. The empirical treatment was cefotaxime+VA (11), with clindamycin (CL) as part in 7 cases. Definitive treatment was beta-lactam ±CL for MSSA, and VA+CL (6), CL (2) or VA (4) monotherapy for MRSA cases. One death occurred. The range of MICs (mg/l) for VA, TEC, LIN was 1-2, 0.5-2, 0.25-2, respectively. Only 2 MRSA strains were resistant to CL.

CONCLUSIONS: MRSA particularly predominates among CA-SA pneumonia in children. Optimal treatment is prompt pleural drainage with proper antibiotic therapy. Treatment provided was effective in all but one patient, despite relatively high MIC_{VA} (≥1 mg/l) in all cases.

ESPID-0570

GRISEL SYNDROME: DIFERENCIAL DIAGNOSIS OF RETROPHARYNGEAL ABSCESS - CASE REPORT

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A 4 year-old girl presented with fever, odynophagia and refusal to feed on November. She was given a diagnosis of tonsillitis and received amoxicillin-clavulanate for 10 days. On November 28 fever returned aside neck pain and neck rotation to the left side, progressively worse. She came to our Emergency room and was in a general good appearance, with the pain and left rotation of the neck and enlarged cervical lymp nodes on the left side. She was submitted to a neck CT scan, collected blood culture, blood cell count and C-reactive protein with the hypothesis of retropharyngeal abscess and admitted to the paediatric ward. The CT scan showed no retropharyngeal abscess and she maintained fever, so the Orthopedics team was asked to evaluate the patient with the possibility of Grisel syndrome. They reviewed the CT scan and a rotational displacement of C1-C2 was noted and the diagnosis confirmed. She started NSAID and a neck collar, with improvement of neck motion and the pain disappeared. A new CT scan was normal and she was discharged with the neck collar and NSAID to be followed.
The Grisel syndrome or atlantoaxial rotatory subluxation (AARS) is a rotational displacement of C1 on C2, thought to be caused by retropharyngeal edema.

In conclusion, children with neck pain, rotation and fever should be evaluated for retropharyngeal abscess, a life-threatening cause, but in the absence of it, other causes should be sought, as the Grisel syndrome.

ESPID-0571

INVASIVE STAPHYLOCOCCUS AUREUS DISEASE IN CHILDREN DURING A 6 YEARS PERIOD

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SPECTRUM OF SDI	COMMUNITY ASSOCIATED n=77			HACO AND HA n=32		
	MSSA n (%)	MRSA n (%)	P value	MSSA n (%)	MRSA n (%)	P value
Osteoarticular	20 (44.5)	16 (50.0)	0.630			
Pneumonia, pleural empyema	3 (6.6)	12 (37.5)	0.001			
Bacteremia	20 (44.5)	2 (6.25)	<0.001	1 (3.8)	-	
Orbital cellulitis + bacteremia	1 (2.2)	2 (6.25)	0.368			
Catheter related bacteremia				14 (53.8)	3 (50)	0.865
Urinary tract Infection + bacteremia	1 (2.2)	-		1 (3.8)	-	
Peritonitis				1 (3.8)	-	
Neonatal BSI with or without focus				9 (34.6)	3 (50)	0.483
Total	45	32		26	6	

BACKROUND AND AIMS: To evaluate the epidemiologic, clinical and microbiological characteristics of invasive *Staphylococcus aureus* disease (ISD) in a tertiary pediatric hospital.

METHODS: Cases were defined as *S. aureus* isolation from a normally sterile site and classified as Hospital-Associated (HA), Hospital-Associated Community Onset (HACO) and Community-Associated (CA) based on data of medical records.

RESULTS: In total, 109 episodes of ISD were recorded among 107 children (boys 54.2%) aged from 2d-5yrs; 40% of episodes occurred among children ≤12m. MSSA infections accounted for 71/109 (65.1%) and MRSA for 38/109 (34.9%). Of these, 77 (70.6%) were CA and 32 (29.4%) HACO/HA, including neonates. Healthcare risk factors were malignancy with central catheter (12), prematurity and long term hospitalization in NICU (12) and CAPD (6 cases in 4 patients). Eleven patients (14.2%) were admitted in ICU, among them 7 had MRSA pneumonia, whereas one died. MRSA accounted for 41.6% of CA cases and 18.7% of HACO/ HA. For NICU in particular, MRSA accounted for 3/12 (25%) cases. The spectrum of ISD is shown in Table:

The annual incidence of ISD was 8.48, 8.0, 4.89, 6.25, 8.48, 5.38 cases/1000 admissions from 2007 to 2012, respectively.

CONCLUSIONS: ISD affects preferentially younger children. OA infections were the most prevalent. MRSA predominated in pneumonia, whereas the majority of bloodstream infections were caused by MSSA. Fortunately, in healthcare setting the incidence of MRSA was relatively low. We did not record significant temporal changes for ISD in our population.

ESPID-0572

THE UTILITY OF ASPERGILLUS BLOOD PCR AS A SCREENING TOOL FOR INVASIVE ASPERGILLOSIS IN A COHORT OF HIGH RISK CHILDREN

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Background: Invasive aspergillosis (IA) has a high mortality rate. Diagnosis of IA is particularly difficult in immunocompromised children. Blood PCR offers the promise of improved and earlier diagnosis. Children post BMT or with primary immunodeficiency are frequently screened for IA using blood PCR. The utility of this practice remains uncertain.

Aims: To assess the utility of *Aspergillus* Blood PCR as a screening tool for the presence of IA in a cohort of children at high-risk of invasive disease.

Methods: Retrospective case-control study of 100 children at high risk of IA (50 with ≥1 positive *Aspergillus* PCR and 50 with ≥1 negative PCR) randomly selected from the microbiology database from 2003-2013. Radiology, and pathology databases, microbiology culture and Galactomannan immunoassay results were interrogated for presence of *EORTC* criteria (2008) for proven, probable or possible IA. Accuracy of *Aspergillus* PCR for predicting presence of IA was calculated.

Results :

Table 1. *Aspergillus* Blood PCR in Invasive Aspergillosis

Total Patients	***Aspergillus* PCR +**	***Aspergillus* PCR -**
IA +	7	2
IA -	43	48
	Sensitivity: 0.78	PPV: 0.14
	Specificity: 0.53	NPV: 0.96

Two consecutive positive *Aspergillus* blood PCRs had: sensitivity, 0.43; specificity, 0.71; PPV, 27%; and NPV, 81%.

Conclusion: Diagnosis of IA remains problematic despite the advent of PCR. Current *Aspergillus* blood PCR lacks the high level sensitivity required for routine screening for IA in our cohort of at risk children. *Aspergillus* PCR testing was negative in 22% of children that fulfilled criteria for IA. However, consistently negative *Aspergillus* blood PCR has high NPV for IA.

ESPID-0573

SEVERE ACUTE MALNUTRITION (SAM) IN BURKINA FASO BEFORE IMPLEMENTATION OF ROUTINE ROTAVIRUS VACCINATION, THE ECHO-LVIA-MMI-PROJECT

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Introduction: According to the latest assessment in Burkina Faso >10% of children <5 years have weight for age measurements >2SD below mean, at least 20% of them suffer from SAM. Rotavirus is the single most important causative organism. We here describe the fight against SAM before the start of routine Rotavirus-vaccination in December 2013.

Method: Since March 2013 we cover the complete North-Western region: 21,700 km^2 with a population of 1,415,000. Five Doctors, 12 nutritionists, one nurse and logistic staff organize care for 245,000 children <5. We expect to identify >10,000 SAM cases and aim to treat >80% of them by:

-Strengthening the local health system.

-Training of 2000 community-health-workers (CHW) in the detection (by mid-upper-arm-circumference (MUAC) measurement) and treatment of malnutrition

-Three door-by-door MUAC screening campaigns

-Free treatment of those affected by SAM and procurement of ready-to-use-therapeutic-food (UNICEF) for moderately malnourished children
-Describing the epidemiology before introduction of mass Rotavirus-vaccination.

Results: As of December 2013 we trained 1700 CHW and 350 nurses, who in two rounds screened 257,748 and 267,526 children, identifying 9,088 with SAM. 8,818 (97.0%) started treatment, 1,513 (17.1%) as inpatients, due to severe complications.

Cure rate was 85.7% for the outpatients and 92.6% for inpatients while death rate was 0.7% and 6.3% respectively. 13.7 and 1.1% were lost to follow-up.

Conclusion: Door-by-door MUAC screening is efficient in identifying children with SAM. Together with a completely free and effective treatment protocol a low mortality rate can be achieved. These data are essential to assess field efficacy of Rotavirus-vaccination in the Sahel.

ESPID-0574

SPONTANEOUS CLEARANCE OF HEPATITIS C VIRUS AMONG A COHORT OF IRISH CHILDREN VERTICALLY INFECTED WITH HEPATITIS C VIRUS

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Aims

To characterise children vertically infected with Hepatitis C virus (HCV) attending the Rainbow Clinic who spontaneously cleared HCV infection.

Methods

From June-August 2013, data were collected retrospectively from medical record and laboratory information system for all HCV-infected children attending the Rainbow Clinic who spontaneously cleared HCV. Spontaneous clearance was defined as 'the loss of HCV RNA on polymerase chain reaction (PCR) in the absence of antiviral treatment'. A standard data collection sheet was used.

Results

Seventeen of 80 (21%) HCV-infected children born between 1996 and 2008 spontaneously cleared HCV infection. Females were over represented among those who cleared spontaneously (14 females [82%]) and compared to chronic HCV-infected children (42 females [62%]). Mean age of spontaneous clearance was 32 months. All 17 children had cleared HCV spontaneously by age 5 years and 2 months. HCV genotype (15) was similar to chronic HCV-infected cohort (Genotype 1, 8; Genotype 3, 7). Mean time to HCV clearance was later for Genotype 1 than 3 (37 versus 27 months). Mean maximum ALT values were greater (136 U/L versus 108U/L) in children who spontaneously cleared HCV compared to chronic HCV-infected cohort.

Conclusions

Spontaneous HCV clearance occurred in 21% of our vertically HCV-infected children. The majority (59%) had cleared HCV spontaneously by 3 years of age. HCV-infected girls appear to clear HCV infection spontaneously more frequently than boys. Peak ALT values occurred prior to HCV clearance, supporting the hypothesis that inflammatory responses in the liver may promote spontaneous HCV clearance.

ESPID-0575

VIRAL CO-INFECTIONS IN HOSPITALIZED CHILDREN WITH ACUTE RESPIRATORY INFECTIONS

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Introduction:Molecular diagnostic techniques allow the identification of pathogens that escape from conventional modalities and frequently reveal more than one microorganism in the samples. The importance of viral co-infections is not well established.***Objectives:***To analyze the patterns and clinical phenotypes of viral co-infection in pediatric patients admitted to hospital with acute respiratory infections(ARI).***Methods:***A prospective multicenter study(GENDRES network) was conducted between 2011-2013 in children admitted to hospital with ARI.Another independent cohort was collected for replication.In addition to the conventional diagnostic work-up, PCR for Influenza(A,B), metapneumovirus, RSV, parainfluenza(1-4), rhinovirus, adenovirus(A-F), bocavirus and coronaviruses(NL63,229E,OC43) identification was performed in nasopharyngeal samples.***Results:***204 samples were collected in the main cohort and 97 samples in the replication cohort. Molecular techniques identified a previously unrecognized virus in the main cohort in 71 cases(34.8%). In both cohorts, RSV was the most frequent pathogen [main=108 samples(53.2%); replication=35 samples (36.1%)]. In 91 samples(44.6%), and 29 samples(29.9%) in the replication cohort, multiple viruses(between 2 and 4) were detected. Co-infections were significantly more frequent in patients 12-48 months-old in both cohorts. The most frequently detected co-infection pattern in the main cohort was RSV-Rhinovirus in 23 patients(11.3%) and in the replication cohort were RSV-bocavirus and bocavirus-influenza in 5 patients(5.2%). Bacterial superinfection increased the severity parameters in both cohorts.No other significant association between pattern of co-infection and clinical features was identified in either cohort.***Conclusion:***Molecular techniques significantly increase the microbiological diagnostic yield. The presence of more than one virus in hospitalized children with ARI is very frequent although the clinical significance of this finding is limited and remains unclear.

ESPID-0576

TYMPANOMETRY PERFORMED BY TRAINED NURSES IN EXCLUDING OTITIS MEDIA WITH EFFUSION IN YOUNG ASYMPTOMATIC OUTPATIENTS

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Introduction
Tympanometry is an adjunctive diagnostic tool for pneumatic otoscopy to detect the presence or absence of middle ear effusion (MEE). In Finland, the resolution of MEE is routinely checked by a physician after an episode of acute otitis media because MEE is thought to affect hearing and the development of speech.
Objectives and Aims
Our aim was to investigate whether nurses without otoscopic experience can reliably exclude otitis media with effusion (OME) in young asymptomatic outpatients.

Methods
We trained 3 nurses without otoscopic experience to perform tympanometry on young outpatients. These nurses performed tympanometry on 151 asymptomatic children aged 6-35 months. The study physician diagnosed healthy middle ear and OME with pneumatic otoscopy which served as the diagnostic standard. The predictive values (with respective 95% confidence intervals) were calculated for peaked tympanograms (A [peak pressure >-100 daPa] and C [peak pressure ≤ -100 daPa]) vs. flat (B) tympanograms, and for type A tympanograms vs. other tympanograms (C and B).

Results
The nurses performed 272/373 (73%) successful tympanograms. 144 (53%) of the successful tympanograms were type A and 212 (78%) peaked. For peaked tympanograms to exclude OME, sensitivity was 68% (55-79%); specificity 91% (87-95%); positive predictive value 70% (57-81%); and negative predictive value 91% (86-94%). For type A tympanograms to exclude OME, sensitivity was 87% (76-94%); specificity 65% (58-71%); positive predictive value 42% (33-51%); and negative predictive value 94% (89-98%).

Conclusions
Due to the high negative predictive value, nurses can exclude OME with type A tympanogram in young asymptomatic outpatients.

ESPID-0577

SEROTYPE EVOLUTION AND ANTIMICROBIAL SUSCEPTIBILITY OF PNEUMOCOCCAL AOM PRE AND POST INTRODUCTION OF 13-VALENT PNEUMOCOCCAL CONJUGATE VACCINE (PCV13) IN GREECE

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Background: The aim was to examine the evolving serotype epidemiology and antimicrobial susceptibility of *Streptococcus pneumoniae* isolates causing acute otitis media (AOM) in children ≤14 y.o. following introduction of PCVs to the Greek NIP.

Methods: Data from a 4 year prospective study (September 2008 -October 2012) conducted in 15 pediatric hospitals are presented. Serotyping was performed by latex agglutination and Quellung reaction using anti-sera (SSI, Denmark). Antimicrobial susceptibility was determined by E-test.

Results: Among 244 isolates collected (52.0% ≤2 y.o.) the commonest serotypes for AOM in the pre-PCV13 period (2008-2010) were 19A (29.3%), 19F (15.8%), 3 (12.0%) and 6A (9.8%) while 1.5 years post-PCV13 (2010-2012) were 19A (19.8%), 3 (11.7%), 11A (9.9%) and 19F, 15A and 24F (6.3% each). Most cases of AOM were caused by PCV13-serotypes and especially the 3 additional to PCV10. Post-PCV13, PCV7-serotypes decreased substantially (65.5%) accounting for only 9.0% of total isolates, serotypes 3, 6A and 19A declined by 42.6% while a significant increase of NVT cases (more than double) was recorded. Full resistance to penicillin pre-PCV13 exhibited 15.8% of isolates vs. 15.5% post-PCV13. A greater decrease, from 47.7% to 37.7% was noted against erythromycin. The most prevalent resistant serotype post-PCV13 remained 19A, accounting for 44.1% (15/34) and 37.8% (17/45) of resistant isolates to penicillin and erythromycin respectively.

Conclusions: AOM cases due to serotypes 3, 6A and 19A decreased substantially post-PCV13 introduction in the Greek NIP. At present, pneumococcal AOM is predominantly caused by non-PCV13 serotypes in concordance with a similar reported shift in nasopharyngeal carriage.

ESPID-0578

SEROPREVALENCE OF ANTI-RUBELLA ANTIBODIES IN PREGNANT WOMEN IN AUSTRIA

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Background and aims

As in most European countries, rubella vaccination is part of the nation wide routine immunization program in Austria and all costs are covered by public financing.

Nevertheless, a rubella outbreak affected parts of the country in 2008-2009.

Methods

We retrospectively analyzed data of 14 722 women who gave birth between 2003 and 2009 in the university clinic in Graz – located in and representative for Styria, the largest of districts affected by the outbreak.

Results

Our findings showed that 18.9% of these women did not have sufficient antibody levels to yield protective immunity. Furthermore, despite the national recommendation to vaccinate unprotected women after delivery (ideally while still in childbed), the percentage of unprotected women increased with the number of previous pregnancies.

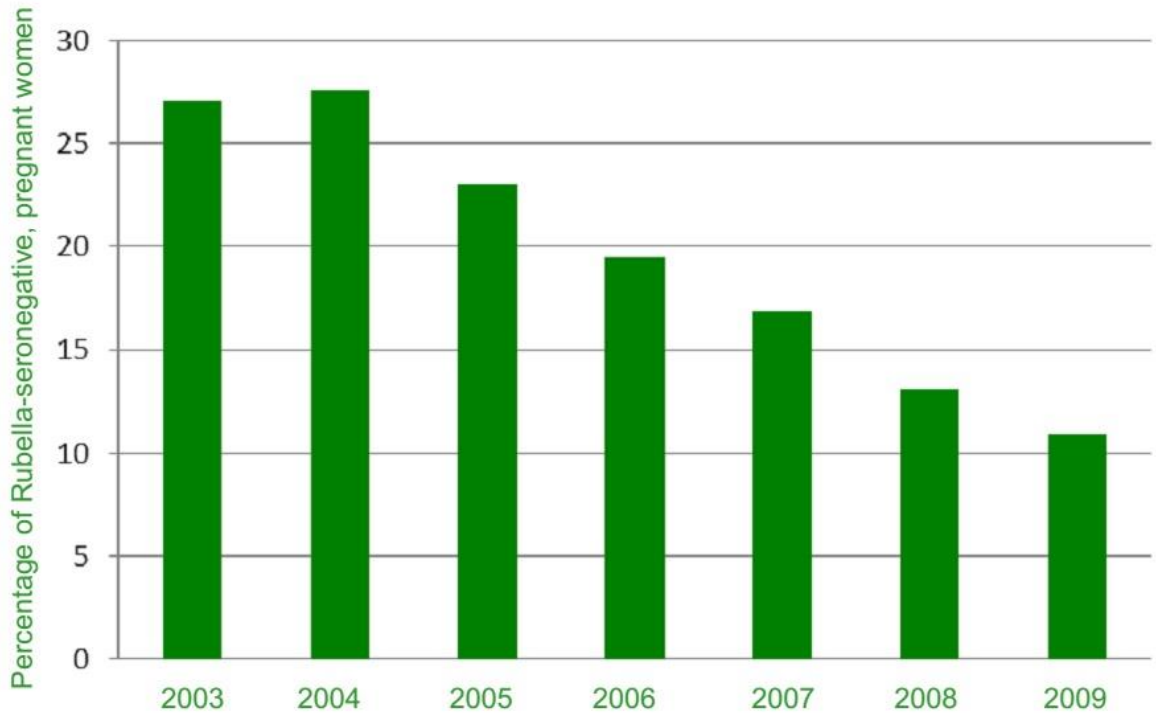
However, during the period under review the percentage of unprotected women decreased from 27.1% in 2003 to 10.9% in 2009 ($p<0.001\%$).

Conclusions

Given the high level of unprotected pregnant women found by our study future rubella outbreaks are a tangible risk. Well-tailored public health measures to prevent further outbreaks and to protect children from the catastrophic consequences of intrauterine rubella infections are needed.

However, further data and studies are needed to guide protective measures and to shed light on the reasons for the comparatively high numbers of unprotected women

in this study group, especially in those with multiple previous pregnancies.



ESPID-0579

IMPACT OF ROTAVIRUS VACCINATION ON CHILDHOOD SEIZURES

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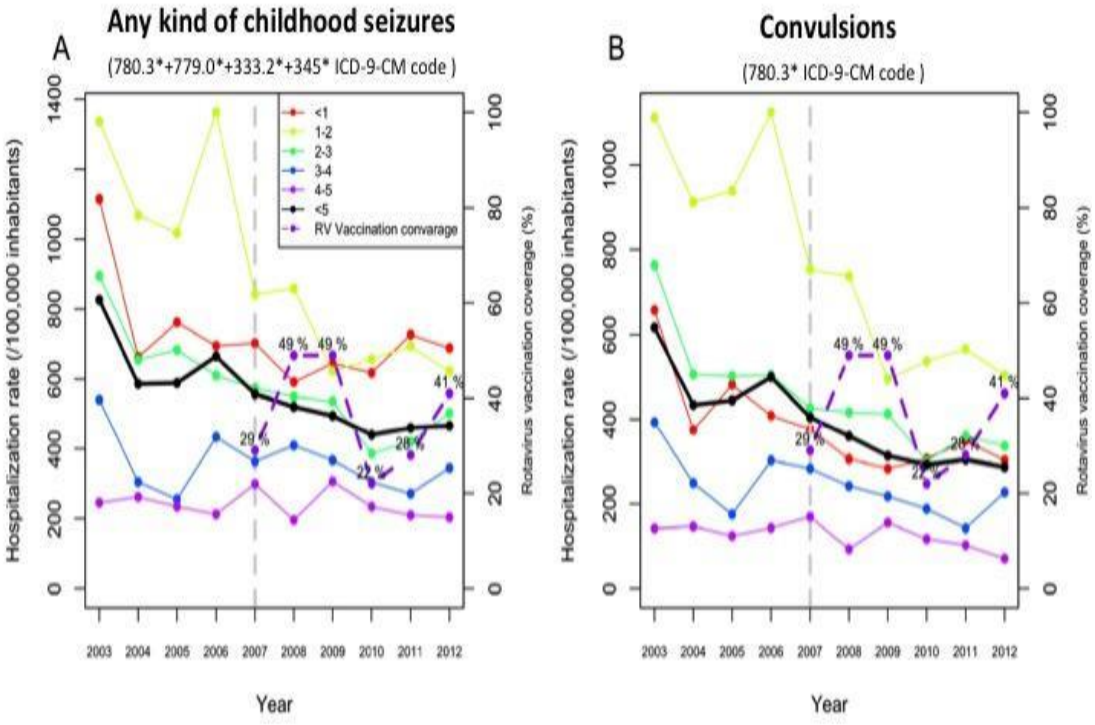
Background and aims: Rotavirus vaccine might reduce the risk of hospitalization due to childhood seizures (CS). We aimed to assess variations in the incidence of hospitalizations for CS among children < 5 years of age before and after rotavirus vaccine introduction. **Methods:** Annual hospitalization rates for any kind of childhood seizures, before and after rotavirus vaccine introduction, were calculated by using the official surveillance system for hospital data. **Results:** Our study cohort totaled 6149 children <5 years admitted to the hospital between 2003 and 2013 with any kind of childhood seizures(780.3*+779.0*+333.2*+345*ICD-9-CM code). The annual hospitalization rates for *any kind of CS* in children < 5 years were correlated significantly with the increase in vaccine coverage(r= -0.673, p=.033)(Figure 1A), with decreases ranging from 16.2% (95% CI = 8.3-23.5%) in 2007 to 34.0 % (27.3 – 40.1%) in 2010 as compared with the median rate of the pre-vaccination period (2003 to 2006). Similarly, for *convulsions*(780.3*ICD-9-CM code) the decrease seen in children <5 years was significantly correlated with the increase in vaccine coverage (r=-0.747, p=.013) (Figure 1B), with decreases ranging from 18.7 % (9.6- 26.8%) in 2007 to 42.5% (35.3- 48.9%) in 2012. Significant results were also obtained for infant<12 months and 1-2 years. **Conclusions:** Our results consistently show that rotavirus vaccination may have a significant impact in the seizure-related hospitalizations in the childhood. This additional benefit of rotavirus vaccination is more marked in the youngest infants.


A
Any kind of childhood seizures
(780.3*+779.0*+333.2*+345* ICD-9-CM code)
Hospitalization rate (/100,000 inhabitants)
Rotavirus vaccination coverage (%)
<1
1-2
2-3
3-4
4-5
<5
RV Vaccination convarage
49 %
49 %
41 %
29 %
28 %
22 %
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
Year
B
Convulsions
(780.3* ICD-9-CM code)
Hospitalization rate (/100,000 inhabitants)
Rotavirus vaccination coverage (%)
49 %
49 %
41 %
29 %
Year

ESPID-0580

GENE EXPRESSION ANALYSIS REVEALS AN IMPORTANT ROLE FOR NEUTROPHILS IN INFANTS WITH SEVERE VIRAL RESPIRATORT TRACT INFECTIONS

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Introduction

The pathophysiology of severe viral respiratory infections in infants remains to be elucidated. In micro-array studies it was shown that neutrophils, inflammation and interferon genes were upregulated during RSV infection. In this study we aim to extend these findings and focus on differences in the immune response of infants with a severe course of disease.

Methods

Affymetrix micro-array analysis on whole blood of 51 patients < 2 years of age with PCR confirmed viral lower respiratory tract infection and 12 age-matched healthy controls was performed. Transcriptome data was analyzed using the modular approach described by Chaussebel et.al[1] and a distance to health was calculated. Subsequently, IL-6, IP-10, IL-8 and gCSF levels in plasma of the same patients were measured and blood smears were analyzed.

Results

The modular distance to health correlated significantly with disease severity, duration of supplemental oxygen and length of stay in the hospital. Moreover these patients clustered together based on disease severity. Especially upregulation of the neutrophil associated module was discriminative for patients with a severe course of disease. This signature was partly caused by cell shift (severe patients had increased numbers of banded neutrophils), but also a result of neutrophil activation (increased plasma levels of gCSF and IL-8). These findings were corroborated by neutrophil specific micro-array analyses.

Conclusions

Neutrophils seems to have an unexpected role during severe respiratory viral infections in children and might offer new avenues for improved diagnostics and therapy.

Reference

1. Chaussabel D, Quinn C, Shen J, et al. A modular analysis framework for blood genomics studies: application to systemic lupus erythematosus. Immunity 2008; 29(1): 150-64.

ESPID-0581

LEPROSY INCIDENCE AND RISK FACTORS FOR DISABILITY IN CHILDREN UNDER 15 IN NORTHEAST-BRAZIL

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Introduction*:* Leprosy in children under 15 years-old is still a major public health problem in developing countries. Disabilities caused by leprosy can be seen in children. Knowledge of risk factors for the development of disabilities caused by leprosy is important for prevention programs.

Aims: We studied the incidence of leprosy, the degree of disability and risk factors for disability in children under 15 years-old.

Methods: A retrospective cohort study with 266 cases of leprosy in children under 15 years-old of Aracaju/SE, Northeast-Brazil, in the period 2001-2012 was studied. Patients were followed monthly until completion of treatment. Those with paucibacillary leprosy were followed for 6 months and multibacillary leprosy for 12 months. Bivariate analysis and logistic regression were performed to identify risk factors for disability.

Results**:** The mean detection rate was 16.52/100,000 inhabitants. In the bivariate analysis, the risk for disability was 14 times higher among children with affected nerves (RR: 14.12; CI95%: 4.85–41.08). Multibacillary leprosy represented a risk of 85% (RR: 1.85; CI95%: 1.22–2.80), whereas reactional episodes constitutes a risk 2.5 times to disability (RR: 2.52; CI95%: 1.04 – 6.11). The variables sex, low income and clinical forms were not statistically significant for disability. The multivariate analysis showed as risk factors: present affected nerve (aOR: 19.5, CI95%: 4.73–80.5, p = 0.000) and multibacillary leprosy (aOR: 2.67, CI95 %: 1.05–6.79, p = 0.03).

Conclusion**:** Affected nerves and leprosy reaction were identified as the main factors associated with the development of disability in children under 15 years-old.

ESPID-0583

RECENT TRENDS OF CHILDHOOD TUBERCULOSIS IN SCOTLAND BETWEEN 2000 TO 2011

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Background: Paediatric tuberculosis (TB) is an important and often neglected component of TB programmes worldwide. In Scotland, a low TB incidence country, the trends of childhood TB are unique from the rest of the UK and therefore require special attention. We describe epidemiology and determine risk factors of paediatric TB in Scotland from 2000-2011.

Method: We describe trends in incidence rates of cases reported to the Scottish TB surveillance system. We also analysed demographic factors, source of infection, gender, region, and age of cases. Carstairs scores were used to determine deprivation by postcode sector. Analysis was conducted using SPSS 19.0.

Results: There were 239 cases of TB in children ages 0-15 years, 44.8% of these were under 5 years. Pulmonary TB was the most common presentation (81.5%), with the average age of nonpulmonary cases greater than pulmonary 9.50 years verses 5.9 years ($p<0.001$). 16.7% of cases were born outside the UK and entered the UK an average of 2.1 years prior to diagnosis. Data suggests age, deprivation, and being UK-born as risk factors for childhood TB in Scotland. 59.4% of TB was identified through contact tracing with the household being the most common source (53.1%). 59.8% of TB cases had not received BCG vaccine and 90% of non-vaccinated cases were UK-born.

Conclusions: Despite low incidence of paediatric TB in Scotland, trend is increasing. 'UK-born' masks second generation immigration to the UK and are still at increased risk of TB. Areas with greater deprivation have more burden of childhood TB.

ESPID-0584

TUBERCULOSIS AMONG HIV-INFECTED CHILDREN AND ADOLESCENTS

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Background: In many countries tuberculosis(TB) is an important cause of morbidity among HIV-infected patients. Our objective is to describe clinical and laboratorial findings at TB diagnosis among HIV-infected pediatric patients.

Methods: We performed a retrospective chart review of patients age 0 to 21y followed at pediatric HIV outpatient clinic from 2008 to June 2013, searching for signs, symptoms, radiologic and Tuberculin test (TT) results, HIV clinical and immune classification at the moment of TB diagnosis. Data were analyzed with SPSS 18.0.

Results: Among 182 patients on regular follow-up, 16 had TB diagnosis (8,8%); pulmonar TB was the most frequent presentation (68,8%), More frequent symptoms were productive cough (35,7%), fever (35,7%), and weight loss (21.4%). Rales was the most frequent sign detected by physical exam (60%). Regarding the radiological findings, bilateral interstitial infiltrates (61.5%) and right unilateral condensation (30.8%) were more common. The (TT) was greater than 5 mm in 45.5% of cases . 56.3% had sputum results: 33.3% had positive smear and 44.4% positive culture. Virtually all patients had detectable viral load at diagnosis of tuberculosis (87.5%) and 56,3% had values of CD4 + lymphocytes ??below 500 cells.

Conclusions: No symptom was pathognomonic of tuberculosis, making it dependent on a combination of data as the literature has demonstrated. Our sample is small, but we can assume that virologic failure was a risk factor for developing TB patient. We should be alert to the diagnosis of TB and to associate more data.

ESPID-0585

VIRAL CONJUNCTIVITIS IN CHILDREN: A MOLECULAR EPIDEMIOLOGICAL ANALYSIS

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Background and aims

Viral conjunctivitis is a common and highly contagious pathology in children which is typically caused by human adenoviruses (HAdV). The aim of the study was to perform a molecular epidemiological analysis of viral conjunctivitis among excess conjunctivitis cases recorded to a University Hospital in Greece, for the period March to June 2012.

Methods

Demographic and clinical data were collected by using a questionnaire during history taking. Eye swab specimens were collected and molecular detection of adenoviruses was performed by nested PCR. Positive results were confirmed by sequencing and a phylogenetic analysis was constructed.

Results

There were 59 conjunctivitis cases (50.85% male and 49.15% female) from which 51 were of viral origin (86.44%) [25 male (49.02%) and 26 (50.98%) female] and 8 were undefined (13.56%). There were no bacterial conjunctivitis. The median age of the children was 7±6.12 years. For the 9 (15.25%) positive samples confirmed by sequencing, 7 samples (77.78%) were typed as AdV17 and 2 were undefined (22.22%).

Conclusion

This study is one of the very few on viral conjunctivitis in children in Greece. Molecular analysis defined AdV17 as the main cause of viral conjunctivitis in children. There is a need for a national epidemiological surveillance system, in order to gather more data, define the source of contamination and the probable risk factors and underline possible preventive methods.

ESPID-0586

A SYSTEMATIC AND FUNCTIONAL CLASSIFICATION OF STREPTOCOCCUS PYOGENES: A NEW TOOL FOR MOLECULAR TYPING AND VACCINE DEVELOPMENT.

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[2]Illawarra Health and Medical Research Institute and School of Biological Sciences, University of Wollongong, Wollongong, Australia

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[4]Bacterial Pathogenesis, Queensland Institute for Medical Research, Brisbane, Australia

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Introduction: Group A streptococcus (GAS) ranks amongst the main causes of mortality from bacterial infections worldwide. Currently there is no vaccine to prevent diseases such as rheumatic heart disease and invasive streptococcal infection. The streptococcal M protein that is used as the substrate for epidemiological typing is both a virulence factor and a vaccine antigen. Over 220 variants of this protein have been described, hindering M protein-based vaccine development.

Objectives: To develop a new typing system that correlates with virulence and support vaccine development.

Aims: Elaborating the classification *in sillico* and validating it experimentally on representative strains.

Methods: A worldwide comprehensive study of 1086 GAS isolates collected from 31 countries representing 175 M-types was used. Clusters of related M proteins were defined based on 4 bioinformatics criteria. Binding capacity of 26 representative M proteins to 5 host ligands was assessed by surface plasmon resonance to validate the system.

Results: A functional classification based on 48 clusters containing closely related M proteins that share binding and structural properties is proposed. Cluster classification is therefore of biological relevance and provides insights into clinically relevant aspects of M protein function. Moreover, the classification correlates with the recently described, but unexplained, cross-protection phenomenon induced by a leading 30-valent vaccine candidate.

Conclusions: This cluster typing system is a new tool that may be widely used to analyze GAS molecular epidemiology. This functional classification will be hosted on the website from the streptococcal reference laboratory at the Centers for Disease Control and Prevention (CDC), Atlanta, USA.

ESPID-0587

EARLY TRANSITION FROM IV TO ORAL ANTIBIOTIC THERAPY IN THE TREATMENT OF DEEP WOUND INFECTIONS AFTER SCOLIOSIS SURGERY

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Introduction: There is no consensus on the preferred route and duration of antibiotic therapy for deep wound infections after scoliosis surgery. This results in tremendous variation in management practice.

Aim: Our aim is to assess the effectiveness of early transition from IV to oral antibiotics with the goal of providing evidence-based therapy recommendations.

Methods: Retrospective chart review of all pediatric patients treated for deep wound infection after scoliosis surgery at a single pediatric institution over a 15-year period (1997-2012).

Results: 48 study patients were identified (mean age 13.9 yrs) 67% of whom carried a primary diagnosis of neuromuscular scoliosis. The predominant organism isolated from deep wound cultures was MSSA and 30% of cultures were polymicrobial. Forty-two patients with deep wound infections s/p spinal fusion were successfully treated with combination IV and PO antibiotics at mean final follow-up of 36 months. Mean duration of IV therapy after surgical I&D was 41 days. Mean duration of subsequent oral therapy was of 8 months. Of these 42 patients, 74% were treated with IV antibiotics for $\leq$ 6 weeks and 15 patients (36%) were transitioned to PO antibiotics within 10 days of I&D. Total antibiotic therapy ranged from 1.5 to 15 months. Of the 48 study patients, 6 underwent multiple I&Ds, long-term antibiotic therapy and ultimately required hardware removal.

Conclusions: These data suggest that deep wound infections s/p scoliosis surgery can be effectively treated with 10-42 days of IV antibiotics followed by culture-directed PO therapy.

ESPID-0588

MOLECULAR SURVEILLANCE OF ROTAVIRUS INFECTIONS IN FRENCH INFANTS: REGIONAL INCREASE IN G12P[8] STRAINS CIRCULATION

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. the French National Rotavirus Network[1]
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Background and aims: Rotaviruses are the major cause of acute gastroenteritis in young children worldwide, and require careful surveillance, especially in the context of vaccination programs, to characterize circulating strains and detect the emergence of potentially epidemic strains.
Methods: From 2009 to 2013, stool samples were collected from 3688 children under 5 years old admitted to the pediatric emergency units of 15 French large public hospitals and suffering from rotavirus acute diarrhea. Rotaviruses were G and P genotyped by RT-PCR.

Results: The genotyping of 3448 rotaviruses showed that G1P[8] strains (65.4% [56.1-74.0]) were predominant; G3P[8] (10.5% [3.9-19.3]), G9P[8] (9.0% [4.9-11.8]) and G2P[4] (8.9% [4.8-18.2]) strains had very changing incidence depending on seasons and regions, whilst G4P[8] (3.4% [1.0-7.4]) strains were mostly circulating locally; G12P[8] strains were progressively increasing over time from 0.1% to reach 4.3% in the last two seasons with relative high detection frequencies in one center (8.2%) and two centers (14.6% and 19.4%) during the 2011-2012 and 2012-2013 seasons, respectively. Globally, most strains were associated with P[8] (89.0% [77.0-93.9]) and P[4] (9.9% [4.8-21.5]). Overall, 100 uncommon strains or zoonotic reassortants (2.9% [2.1-4.6]) were also detected such as G8 (8%) and P[6] (25%) strains.
Conclusions: The relative stability of rotavirus genotypes may ensure vaccine effectiveness in the medium terms in France. The recent increase in G12 strains circulation might prefigure their future global emergence as a major epidemic genotype. Special attention should be paid more particularly to the emergence of new rotavirus reassortants not included in current rotavirus vaccines.

ESPID-0589

VACCINE INDUCED SELECTION MIMICS WANING IMMUNITY IN PERTUSSIS

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[1], *Santa Fe Institute, Santa Fe, USA*

Introduction Two leading hypotheses have been proposed to explain the recent resurgence in whooping cough incidence: 1) the waning of protective immunity from vaccination, and 2) evolution of pertussis toxin away from vaccination protection. Evidence for waning immunity (WI) has been suggested in studies using age-specific incidence data, and for evolution through sequencing studies of *Bordetella pertussis*. Distinguishing these two hypotheses using traditional count-based epidemiological data, however, may not be possible.

Methods Age-specific incidence rates of whooping cough were simulated using an individual-based simulation of whooping cough transmission with age-specific mixing and transmission rates, and both WI and pathogen evolution. Previously published models were used to estimate the duration of WI on data simulated with: 1) no WI and no evolution, 2) WI and no evolution, 3) evolution and no WI, and 4) both WI and evolution.

Results Simulated whooping cough incidence was similar to that seen recently in the US. We estimate significant WI in models where the loss in vaccine protection was due to WI and when it was due solely to pathogen evolution. Estimates of the duration of WI depended on the parameters used to generate the incidence data, but were similar when comparing WI to evolution as the driver of loss of protection.

Conclusions Distinguishing WI from pathogen evolution of may not be possible using classical epidemiological data. This carries direct and important consequences for the future of pertussis vaccination policy. More studies are necessary to understand the dynamics of pertussis immunology within individuals over time.

ESPID-0590

INTERLEUKIN-10 -1117 A/G AND INTERLEUKIN-10 -3585 T/A SINGLE NUCLEOTIDE POLYMORPHISMS IN CHILDREN WITH RSV INFECTION

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Introduction

Currently, it is not clear which factors contribute to the susceptibility and severity of RSV infections in previously healthy children. The presence of single nucleotide polymorphisms (SNPs) in immune related genes have been correlated with the clinical course of RSV infections in infants. We tested whether the presence of two SNP's in the IL10 gene influenced the IL10 production and clinical course of disease in infants with an RSV infection.

Methods

DNA and blood was collected from 158 children with a lower respiratory tract infection due to RSV. Children with chromosomal abnormalities or a history of prematurity, heart or lung disease were excluded. The course of disease was retrospectively determined. PCR was used to detect single nucleotide polymorphism in the promoter region of the IL-10 gene (-1117A/G and -3585 T/A, respectively). Plasma levels of IL-10 were determined and PBMC's were stimulated *ex vivo* with LPS to measure the IL10 response after 20 hr.

Results

Both SNP's were in Hardy-Weinberg equilibrium. There were no differences in genotypes or allele frequency among the severity classes. Moreover, duration of hospitalization and duration of supplemental oxygen need were similar among the genotypes. When functional consequences of SNP's were studied, no differences were found in plasma IL-10 levels obtained during active infection. However, patients with IL-10 $^{-3538\ T/T}$ had higher plasma levels than patients with the IL-10$^{-2528\ A/A}$ genotype in their recovery phase. PBMC stimulation showed similar responses after LPS stimulation, although we did see higher IL-10 response in patients without mechanical ventilation compared to patients with the same IL-10$^{-3538\ A/A}$ genotype who needed mechanical ventilation.

Conclusion

We could not find a correlation between the presence of two SNP's in the IL-10 promotor region and severity of disease in patients with RSV infections. An increase in sample size is needed to evaluate the effect on IL10 production after stimulation.

ESPID-0591

CHARACTERISTICS OF INVASIVE COMMUNITY-ACQUIRED STAPHYLOCOCCUS AUREUS (CA-SA) INFECTIONS IN CHILDREN: A EUROPEAN MULTI-CENTRE STUDY (PISA STUDY)

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Aims: The aim of the study was to describe the characteristics of invase CA-SA infections, the prevalence of CA-MRSA and to analyse factors related to the severity of invasive infection by CA-SA in children in Europe.

Methods: A prospective, multi-centre European study was performed, analyzing epidemiological, clinical and microbiological data from 1-10-2012 to 30-09-2013. Severe infection was defined as an invasive infection that led to death or admission in the ICU because of hemodynamic instability, respiratory failure or other severe condition.

Results: A total of 71 children (43 boys) were identified at ten European centres. Median age was 7.2 ± 5.4 years and 30% had a chronic disease. The most common primary diagnosis were bone or joint infections (58%; 14% being multifocal), pneumonia (21%) and bacteraemia (16%). The median hospital stay was 19.1±13.6 days. Fifteen patients (21%) needed ICU admission: mostly because of septic shock (median stay= 6.1 ± 6.8 days) and 6% died. At admission, median CRP, white cell-count and temperature value were 8.8 ± 8.7 mg/dl, 12600 ± 7200 cells/m3 and 38.8 ºC ± 0.8. Prevalence of methicillin and clindamycin resistance were 6% and 9%, respectively.

When comparing non-severe cases with children with severe CA-SA infections, the latter had higher initial CRP values (16.1±10.8 vs 7.2±7.5, $p<0.05$) but no other differences were observed (sex, age, predisposing factors, site of infection, temperature, white cell count or antimicrobial resistance).

Conclusions: Pediatric invasive CA-SA infections are severe in a significant number of cases. Methicillin resistance is still uncommon and does not seem to be related to severity. Higher CRP values at admission but not other variables are associated with the severity of infection.

ESPID-0594

HIV INFECTED CHILDREN AND ADOLESCENTS IN PORTUGAL - 2013

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Introduction: Prevention of HIV infection from mother-to-child transmission (MTCT) has been successful in Portugal, with rates below 2% since 2005.
Aim: This study aimed to characterize the Portuguese experience with living HIV infected children and adolescents.

Methods: A national survey of HIV infected children and adolescents was accomplished referred to the 31st July 2013.

Results: 308 HIV infected patients (10 HIV2) are followed in 9 paediatric centres. Sixty percent are adolescents (age > 12 years). MTCT occurred in 92%, with 45% diagnosed in the first year. CDC classification at diagnosis was N1 in 50% and C3 in 10%. Initial viral load was > 100000 copies/ml in 52%. Ninety-two percent received cARTand the initial preferred regimen was boosted PI + 2NRTI. The majority (54%) had to change cART and 16% had > 3 different regimens. Side effects were referred in 14%, mostly lipid abnormalities. 10% progressed to AIDS. At present, 71% had undetectable viral load and 80% normal CD4 values. The follow-up was longer than 10 years in 53%.

Conclusions: In 2013 the majority of HIV infected paediatric patients in Portugal are adolescents. Most are suppressed with normal CD4 count. An increasing number is making the transition to adult clinics and many are extensively ART-experienced. A long-term follow-up of this cohort is important for a better knowledge of the evolution and prognosis of MTCT HIV infection.

ESPID-0595

INCIDENCE OF INVASIVE CNS DISEASE WITH UREAPLASMA SPP. IN A COHORT OF VERY LOW BIRTH WEIGHT PRETERM INFANTS

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Introduction
Ureaplasma spp. are the most common bacteria implicated in human urogenital infections including complications of pregnancy in women. Infection and colonization of newborns with Ureaplasma spp. has been associated with adverse neonatal outcomes, however little is known about the incidence of Ureaplasma meningitis in neonates. Two published UK studies, conducted more than two decades ago showed the prevalence of CNS infection with Ureaplasma spp. of 8% and 0.7% respectively. These studies included premature and term infants and the organism isolation was relying on culture-based methods. In contrast, recent US study shown much higher incidence of Ureaplasma CNS infection.
Aims
To estimate current incidence of invasive CNS disease with Ureaplasma spp. in a prospective cohort of very low birth weight preterm infants in the UK.

Methods
All consented infants with birth weight <1500 g admitted to the Neonatal Intensive Care Unit who underwent lumbar puncture as part of septic screen during the first 14 days of life. Cerebrospinal fluid samples were tested for Ureaplasma species using specific real time PCR.

Results
During the period August 2012 - November 2013 CSF samples from 51 infants were analysed and we have not detected any Ureaplasma spp. positive samples.

Conclusions
Using modern molecular diagnostic tests we have not detected any Ureaplasma spp. positive samples in our cohort, which according to our knowledge, is the largest tested cohort in the UK so far.

ESPID-0596

IMPACT OF ROTAVIRUS VACCINE IN DIARRHOEA MORTALITY AND HOSPITALIZATIONS IN BRASIL

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Introduction*:* Rotavirus is the most important cause of severe diarrhea in the world and is associated with large number of hospitalizations in all places and with diarrhea mortality in low/middle income countries.

Aims: We evaluated the trend of diarrhea mortality and hospitalization in Aracaju city, Sergipe state and Brazil before and after Rotavirus vaccine introduction in 2006.

Methods: A retrospective surveillance data analysis comprising the period before and after the rotavirus vaccine introduction in children under 5 years-old in the period 1999-2012 was studied. Rotavirus vaccine coverage (2007 – 2011), diarrhea hospitalization and mortality were recovered from official government databases (http://www.datasus.gov.br/) for Aracaju, Sergipe and Brazil, using the International Diseases Classification (IDC) codes A08 and A09. Comparison between the periods before and after vaccine introduction is presented.

Results**:** Rotavirus vaccine rapidly has reached over 80% coverage in Brazil. Diarrhea hospitalization reduction was of 40.3% in Brazil, 52% in Sergipe and 38% in Aracaju from 2003 to 2012. Diarrhea mortality was reduced in 84% in Brazil, 86% in Sergipe and 94% in Aracaju, from 1999 to 2012. Diarrhea hospitalization was reduced in 1.7% from 2003 to 2005 and in 39.2% from 2006 to 2012. Diarrhea mortality was reduced in 45% from 1999 to 2005 and 71% from 2006 to 2012.

Conclusion**:** Rotavirus vaccination had an important impact on diarrhea hospitalization and deaths reduction in Aracaju city, Sergipe state and Brazil.

ESPID-0597

REFRACTORY KAWASAKI DISEASE TREATMENT WITH INFLIXIMAB

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Introduction: Kawasaki disease (KD) is a self-limited systemic pediatric vasculitis. Its aetiology remains unknown. Current estimates indicate that 10 to 20% patients do not respond to single dose of intravenous immunoglobulin (IVIG). The optimal therapy of these refractory cases is still controversial.

Case presentation: Eight month-old boy presents with 3 days lasting fever, polymorphous rash, bilateral nonsuppurative conjunctivitis, cervical lymphadenopathy, dry fissured lips, strawberry tongue, BCGitis and periungueal desquamation. Coronary evaluation was initially normal but aneurysms were later detectable with left coronary artery (3,5mm), anterior descending artery (3,3mm) and right coronary artery (3,7mm) involvement.

Aspirin and IVIG (2g/kg) were administered on day 4. On the7th day of illness fever and extremities changes recurred and warranted a new IVIG dose. On day 15th, due to reappearance of fever methylprednisolone (30mg/Kg) was administered for 5 days. Three days after corticosteroid weaning fever recurred and infliximab (5mg/kg) was given on day 32nd, with defervescence, reduction of inflammatory markers and coronary aneurisms.

Conclusion: The present case presented without several risk factors for severe disease and was refractory to standard treatment. Indeed, inflammatory response was only blocked by Infliximab. TNF-a blockade seems to be a good therapeutic option for refractory and/or high-risk patients, however a need for multicentre, randomized trials is imperative.

ESPID-0598

INCIDENCE OF COMPLICATIONS AND INDEPENDENTLY ASSOCIATED FACTORS IN YOUNG CHILDREN WITH UPPER RESPIRATORY TRACT INFECTION

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Background and aims: Upper respiratory tract infections (URI) are the most frequent reasons for visits at pediatric emergency rooms. We aimed to describe the incidence of complications in children aged between 6-23 months after an URI episode and to evaluate association between poor evolution and child´s history, environmental factors and clinical characteristics.

Methods: In this prospective cohort children with URI for up to seven days were evaluated and a follow-up visit was held between 14-21 days after enrollment when a thorough evaluation was performed. Poor evolution was considered when the child had at least one of the following complications: hospitalization, fever, wheeze, convulsion, pneumonia and otitis and the last two were diagnosed by a doctor. Multiple logistic regression model and adjusted odds ratio with 95% confidence interval was calculated.

Results: Of 281 enrolled children, 205 (73%) returned between the 14th and 21th day (mean 21.7 ± 10.7) after recruitment, out of which 101 (49.3%) had a poor evolution. The use of oxygen in the neonatal period (9.0% *versus* 1.2%; OR: 1.74 [1.28-2.36]), exposure to tobacco at home (25.7% *versus* 11.5%; OR: 1.72 [1.32-2.25]), ronchi on auscultation (49.5% *versus* 29.8%; OR: 1.60 [1.21-2.12]) and pneumococcal vaccination (38.0% *versus* 51.5%; OR: 0.69 [0.51-0.93]) were associated with poor evolution.

Conclusions: Half of the children presented complications. Oxygen use in the neonatal period, exposure to tobacco at home and ronchi on admission are independent risk factors for whereas pneumococcal vaccination is an independent factor of protection against complications among young children with URI.

ESPID-0600

HERPES SIMPLEX ENCEPHALITIS – DOES INTERFERON CARE?

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Introduction and aims: herpes simplex encephalitis (HSE) is an acute, life-threatening disease, requiring prompt intervention. TLR3-interferon (IFN) axis defects in the antiviral innate immune response against HSV-1 and some genes (*TLR3*, *UNC93B1* and *TRAF3*) probably play an important role in HSE pathogenesis.

Methods: Descriptive study between January 2007 and December 2012 from HSE patients treated with acyclovir (initiated between D2 to D3 of illness) and INF alpha-2b. HSV-1 was detected by PCR from CSF. PBMC and fibroblasts were studied for their IFN responses to TLR3 and virus stimulations. Coding exons of the known HSE-associated genes were sequenced.

Results: Six cases, aged between 7 months and 11 years, with seizures and extensive brain injury. Interferon was initiated between D3 and D18. Patient 1 initiated IFN on D18 and stopped 7 days later for bicytopenia. Patient 2 started on D3 and has no sequelae. Patient 4 started on D5 and has persistent right sided hemiparesis. Patient 3, 5 and 6 started on D5, D3 and D7 respectively remain with epilepsy under medical control**.** Only Patient 1, who started IFN later than D7, has sequelar tetraparesis. None of the other patients have severe neurological deficits. The functional studies were normal, except for patient 1 whose fibroblasts displayed impaired IFN-lambda production after stimulations of poly(I:C), thought to be TLR3-dependent. No mutation was found in the sequenced coding exons of *UNC93B1*, *TLR3* and *TRAF3*.

Conclusions: Although a small sample, our results suggest that IFN therapy should be considered in the treatment of HSE.

ESPID-0602

GROUP A STREPTOCOCCUS EMM TYPE IN IRANIAN CHILDREN WITH PHARYNGITIS

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Introduction :
Group A streptococcal (GAS) pharyngitis among children leads to serious disease like rheumatic fever (RF) and rheumatic heart disease (RHD) in Iran, as compared to the western world where invasive diseases are common. GAS encodes numerous virulence factors.

Objectives:
We studied the *emm* genes of GAS isolated from the throat of children with pharyngitis and sore throat.

Methods:
Seventy one GAS isolates cultured from throats of children in Tehran aged 1-14 yr with pharyngitis and sore throat during 2013, (Diagnosis of streptococcal colonies was based on the type of hemolysis and the results of catalase & oxidase tests, PYR reaction and inhibition zone formation around a disk containing 0.04 U of bacitracin) were *emm* typed. The *emm* genes were PCR amplified from each strain and sequenced to determine the *emm* types.Positive general *emm* typing were further examined for their subtyping.

Results:
Group A streptococcal (GAS) were examined for twenty three *emm* types,. The most prevalent types were *emm* nontypable 15% (11), *emm* 1 and *emm*15, 9.8% each(7) and *emm* 6 and 18, 8.4% and 5.6% respectively and *emm* 3, 11 and 76, 1.4% each.

C**onclusions:**
GAS isolates collected from throats of children from Tehran possess highly virulent antigens. However, the presence of superantigen genes in *emm* nontypeable may inevitably play an important role in the pathogenesis of these nontypeable strains in the absence of the primary virulence factor, M protein.

Keywords: *emm* types, Group A Streptococcus , pharyngitis, Iran

ESPID-0603

HEALTHCARE-ASSOCIATED COMMUNITY-PRESENTING SEPSIS IS DIFFERENT FROM COMMUNITY-ACQUIRED SEPSIS - PATTERN OF TREATMENT USING CARBAPENEMS AND GLYCOPEPTIDES

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Introduction/aims: The epidemiology of healthcare-associated community-presenting (HCA) bacterial infections likely differs from community-acquired (CA), but may correspond to that of hospital-acquired (HA) infections. We explored whether differences in pathogen spectrum of CA, HCA and HA sepsis **were anticipated by clinicians when choosing treatment with** glycopeptides and carbapenems in a cohort of Swiss children.

Methods: Data on 322 episodes of pediatric (age >1month-17 years) blood culture (BC) proven sepsis included in a prospective Swiss national pediatric sepsis cohort from September 2011 to November 2013 were analysed. Episodes were classified as CA when BC was obtained ≤48 hours from hospitalisation, as HCA in children with specific risk factors, and as HA when BC was obtained >48 hours after hospitalisation.

Results: Information on isolated pathogens and antibiotic treatment was available for 312/322 episodes. Pathogen distribution and treatment strategies are shown below.

		CA	HCA	HA
Gram positive		64%	52%	49%
	CONS	0	11%	9%
Gram negative		36%	47%	44%
	K.pneumoniae or *P.aeruginosa*	1%	12%	20%
Fungi		0	1%	7%

Empiric	**CA**	**HCA**	**HA**
Carbapenems	1.3%	21.7%	30%
Glycopeptides	0.7%	21.7%	41.3%
Both	0%	7.2%	16.3%
Definitive			
Carbapenems	0.7%	19.3%	30.0%
Glycopeptides	0.7%	13.3%	18.8%
Both	0%	1.2%	8.8%

Conclusion: Carbapenem, glycopeptide, or combined treatment in empiric and definitive therapy was highest for HA, intermediate for HCA and lowest for CA sepsis. It is partially explained by variations in pathogen spectrum and probably additional variations in susceptibilities. Swiss clinicians identify HCA sepsis as different from CA in terms of empiric treatment decisions.

ESPID-0604

PATHOGEN IDENTIFICATION IN PEDIATRIC SEPSIS RESULTS IN STREAMLINING OF CRITICALLY IMPORTANT ANTIMICROBIALS

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Introduction/aims: International guidelines emphasize administration of empiric broad-spectrum antibiotic therapy in cases of sepsis. However, antibiotics are recommended to be rapidly streamlined when microbiological results become available. We assessed the extent of streamlining in a Swiss cohort of children with sepsis.

Methods: Data on 322 episodes of pediatric (age >1month-17 years) culture-proven sepsis included in a prospective Swiss national pediatric sepsis cohort from September 2011 to November 2013 were analysed. Exposure to three critically important antibiotic classes (CIAs – penicillins plus beta-lactamase inhibitor, higher-generation cephalosporins, and carbapenems) was assessed, as those are among the main targets of antimicrobial stewardship.
Results: Information on exposure to CIAs is shown for 312/322 episodes with complete data below.

	CIA exposure-definitive		
CIA exposure-empiric	**Yes**	**No**	**Total**
Yes	161(51.6%)	66(21.2%)	227(72.8%)
No	15(4.8%)	70(22.4%)	85(27.2%)
Total	176(56.4%)	136(43.6%)	312(100%)

Streamlining resulted in a 23% reduction of CIA regimens from empiric (72.8%) to definitive (56.4%) therapy ($p<0.01$). The 66 patients switched from CIAs to alternatives were most commonly definitively treated with penicillins (61%), glycopeptides (12%), and penicillins plus aminoglycosides (8%).

Only 6.9% of Gram-negative (total 40.7% episodes), but 32.8% of Gram-positive episodes (total 51.1% episodes) were never exposed to CIAs ($p<0.01$). Definitive CIA-therapy was administered in 82.4% of Gram-negative, but only in 39.1% of Gram-positive episodes ($p<0.01$).

Conclusion: As broad-spectrum agents, CIAs are widely used for the empiric therapy of sepsis in Swiss children. Streamlining to non-CIA regimens occurred in 1/5 initially

started on a CIA regimen. Gram-negative bacteria more often resulted in definitive CIA regimens.

ESPID-0606

QUANTIFYING THE EPIDEMIOLOGICAL RISK OF ANTIVIRAL RESISTANT INFLUENZA LINEAGES FROM SEQUENCE DATA

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Introduction Antiviral-resistant Influenza represents a significant threat to pediatric health. However, due to its rapid evolution, obtaining accurate, early situational awareness for antiviral resistant influenza remains a challenge. Genetic sequence data, now routinely collected during outbreaks, can provide an unprecedented opportunity to advance our scientific understanding of antiviral resistance and our public health capacity.

Objectives (1) construct models of antiviral resistant influenza outbreaks using sequence data, (2) estimate the epidemiological parameters of historical outbreaks, and (3) improve situational awareness of levels of resistance in the population.

Aims To improve global public health by enhancing situational awareness of antiviral resistant influenza.

Methods The primary tool for modern population genetic inference is coalescent theory, which provides a retrospective, mathematical framework for relating genetic variation to historical evolutionary and demographic processes. Here we apply coalescent models to historical sequences obtained from influenza viruses with known antiviral resistance/sensitivity. Epidemiological parameters, including the basic and effective reproductive number and outbreak size, were estimated using sequential Monte Carlo and used to determine risk. The accuracy of estimated risk was evaluated using historical outbreak data.

Results The model of antiviral resistant influenza developed in this study was capable of: (1) accurately recreating historical outbreaks of resistant influenza and (2) expeditiously determining the expected outbreak size of resistant lineages.

Conclusions Our approach improved the timing and accuracy of outbreak size estimates for antiviral resistant influenza. This improvement can enhance situational awareness, which facilitates the ability of physicians to determine appropriate and effective treatment courses.

ESPID-0607

THE EFFECT OF AGE BANDING ON DAILY DOSE OF AMOXICILLIN/CO-AMOXICLAV IN THE TREATMENT OF COMMUNITY ACQUIRED PNEUMONIA IN THE UK

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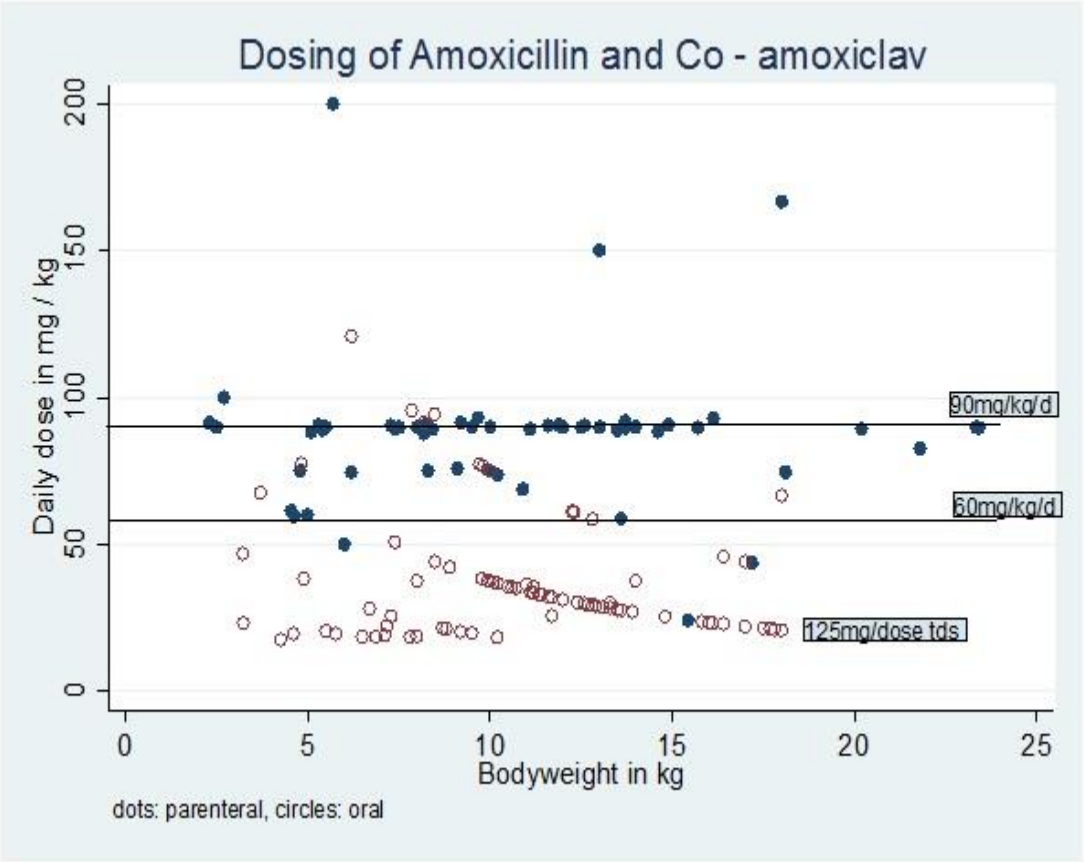
Introduction/aims: Amoxicillin is recommended as first-line treatment of childhood community-acquired pneumonia (CAP) in the UK. The British National Formulary for Children (BNFC) specifies dosing for amoxicillin-based treatments as 60-90 mg/kg/d for parenteral and 125mg three times daily for oral administration in children 1-5 years of age. We aimed to evaluated dosing strategies for amoxicillin-based treatments of CAP in the UK.

Methods: Data on amoxicillin and co-amoxiclav prescriptions for inpatient children collected during ARPEC point prevalence surveys in 2011 and 2012 using a validated standardized method for data collection were analysed. Descriptive statistics were calculated for paediatric patients aged 1-5 years receiving at least one antimicrobial for the treatment of CAP.

Results: Of 3011 prescriptions captured in 66 participating centres, 440 (14.6%) were for CAP in the target age group. Of these 181 (41%) were for amoxicillin or co-amoxiclav. The distribution of daily amoxicillin/co-amoxiclav dose in mg/kg

bodyweight for oral and parenteral treatments is shown below.



The median daily oral dose of amoxicillin/co-amoxiclav was 30mg/kg bodyweight (IQR 23-38) compared with 89mg/kg bodyweight (IQR 75-90) parenterally. Bodyweight did not differ between children treated parenterally (mean 12.7kg) or orally (mean 13.2, p=7.27).

Conclusions: Point prevalence data was analysed to evaluate current dosing strategies for amoxicillin-based therapy in the UK. Amoxicillin-based treatments for CAP in young children were mostly administered according to BNFC recommendations, resulting in differences between orally and parenterally administered daily dose which may not be clinically appropriate. To address potential systematic underdosing of oral treatment, the current banding system requires revision.

ESPID-0608

FAVOURABLE IL-28B GENE POLYMORPHISMS ARE ASSOCIATED WITH SPONTANEOUS VIRAL CLEARANCE IN CHILDREN WITH HEPATITIS C VIRAL INFECTIONS

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Introduction: The interleukin-28B gene (IL28B) locus encodes interferon (IFN) λ3, a type 3 INF involved in host antiviral immunity. Favourable IL28B polymorphisms are strong predictors of treatment response in HCV genotype-1 infected adults.

Aim : To examine the association between IL-28B gene polymorphisms and spontaneous clearance of HCV infection in a cohort of vertically infected HCV Irish children.

Method: Medical and laboratory data from HCV-infected children attending the Rainbow Paediatric Infectious Diseases Clinic from 1996 to 2013 were reviewed. Spontaneous clearance was defined as loss of HCV RNA on PCR in the absence of antiviral treatment. HCV and IL28-B single nucleotide polymorphism rs 12979860 genotyping was performed in the National Virus Reference Laboratory.

Results: 17 of 86 (20%) HCV-infected children, spontaneously cleared HCV infection. IL28B genotype was available for 63 children. 9 of 10 (90%) children who spontaneously cleared HCV infection, had IL28B C/C genotype (genotype-3, 4; genotype-1, (3); unknown genotype, 2). HCV genotypes were evenly distributed (genotype-1, 8; genotype- 3, 7) compared with chronically HCV- infected children (IL28B C/C genotype, 22 [42%]; non-C/C genotype, 31 [58%]) (19 CT;12 TT). Children with C/C genotype were more likely to clear HCV compared to those with C/T and T/T genotypes (odds ratio = 12.6; 90% confidence interval = 1.49-107.4; *P* = 0.02).

Conclusions: IL28 B genotypic variation in children appears strongly associated with likelihood of spontaneous HCV clearance, regardless of HCV genotype. What role IL28B genotype plays in response to existing and future antiviral treatment of HCV-infected children remains to be elucidated.

ESPID-0609

RISK ADJUSTMENT FOR UNDERLYING CHRONIC DISEASE IN EMPIRIC TREATMENT REGIMENS FOR CHILDHOOD BLOODSTREAM INFECTION CAN IMPROVE TREATMENT APPROPRIATENESS

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Background/aims: Bloodstream infections (BSI) can be community-acquired (CA), hospital-acquired (HA) or healthcare-associated (HCA) when patients have chronic underlying diseases (UDs) and therefore frequent healthcare contacts. HCA-BSIs are likely to have a resistance phenotype closer to HA-BSIs. We aimed to assess whether including information about UD could identify HCA-BSI based on resistance phenotype.

Methods: Data for invasive bloodstream isolates from patients aged 0-17 years collected from 19 centres in 10 European countries were analysed. Resistance phenotypes identified as key for HA-BSI by the Infectious Disease Society of America were assessed: *E. coli* – third generation cephalosporins (3GC), *K. pneumoniae* – 3GC or carbapenems, *P. aeruginosa* – aminoglycosides or carbapenems, *S. aureus* – methicillin, *E. faecium* – vancomycin, *E. faecalis* – gentamicin. Blood culture ≤48 hours after hospitalisation was defined as CA-BSI, >48hours after hospitalisation as HA-BSI.

Results: Complete information on UD and type of BSI was available for 878/1386 (63%) isolates in the reporting period 2011-2012. 76% (671/878) BSI occurred in patients with UD, including 180/312 CA-BSI and 491/566 HA-BSI. The proportion of resistant isolates according to UD and type of BSI is shown below.

Resistance phenotype	CA-BSI,no UD	CA-BSI,UD	HA-BSI,no UD	HA-BSI,UD
Absent	119(90.2%)	154(85.6%)	58(77.3%)	340(69.3%)
Present	13(9.8%)	26(14.4%)	17(22.7%)	151(30.7%)

$p<0.01$, $\chi 2$

Conclusions: There was a stepwise increase in specific resistance from CA-BSI in otherwise healthy children to HA-BSI in children with UD. It is likely that UD is a marker of healthcare exposure and therefore an important factor in determining resistance phenotype. It should be taken into account in the design of empiric treatment protocols.

ESPID-0611

CHARACTERIZATION OF 2,981 BORDETELLA PERTUSSIS STRAINS ISOLATED IN BRAZIL FROM 2000 TO 2013

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Background and objectives: The recent reemergence of pertussis in many countries, including Brazil, can be associated with many possible factors, including changes in the most prevalent strains. This study aims present an overview of current profiles of pertussis strains isolated in Brazil from 2000 to 2013. **Methods:** 2,891 presumptively identified *Bordetella spp* were forwarded from the Regional and the Central Public Health Laboratories to the National Reference Laboratory for Pertussis, Instituto Adolfo Lutz, São Paulo, Brazil. Strains were cultured using standard methods. Detection of O1 antigen and the serotyping were performed by slide agglutination test using O1, and Fim 2 and Fim 3 antibodies. **Results:** All the 2,891 strains were confirmed as *B. pertussis*: 40% of them belonged to the serotype 1,3, 12% and 5% belonged to serotype 1,2 and 1,2,3 respectively; 40% of them didn't express Fim 2 or Fim 3. The great majority of strains (78.6%, 2,273/2,891) were isolated from children under ten years old, and among them 80.7% (1,835/2,273) from children < 6 months of age. Strains isolated from adolescents/adults accounted for 13.8%. The age group was unknown in approximately 7.5%. **Conclusion:** The serotype 1,3 was the most prevalent before and after pertussis reemergence in Brazil. The low prevalence of strains isolated from adolescents/adults probably is associated with low awareness of pertussis as cause of cough in these age groups, which contributes for the common underreporting. Our data may represent only a fraction of the actual number of pertussis cases occurring in this country.

ESPID-0612

RESPIRATORY SYNCYTIAL VIRUS (RSV) INFECTIONS IN A PORTUGUESE PAEDIATRIC INTENSIVE CARE UNIT (PICU): A 10-YEAR REVIEW

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- Introduction: RSV remains the leading cause of lower respiratory tract infection (LRTI) among infants and young children.
- Aim: To determine the epidemiology/characteristics of patients with RSV infection admitted to a PICU.
- Methods: Ten-year retrospective study of children admitted to PICU with RSV infection. Data related to risk factors, palivizumab prophylaxis, therapeutic requirements and outcome were collected. RSV was identified by direct immunofluorescence/polymerase chain reaction methods. Statistical analysis: PASW Statistics 18®.
- Results: Eighty-three cases were included: 48% from 2004-2008 and 52% from 2009-2013. The highest number of admissions occurred in January/February (66%). Seventy-six (92%) were under 12 months (71% <3 months). Nineteen infants had risk factors for severe disease: 14 gestational age <34 weeks, 6 congenital heart disease, 4 bronchopulmonary dysplasia and 2 neuromuscular disease. Although 12 infants were eligible for RSV prophylaxis, only 1 received palivizumab previously. Three viral co-infections were found. Fifty-one children (61%) required respiratory support (67% invasive ventilation). There seems to be an increasing use of non-invasive ventilation in the last 5 years (26% vs. 13%), although not statistically significant (p=0,118). The main associated complication was pulmonary atelectasis (41%). Median length of stay was 5 days. There was no association between presence of risk factors and length of stay/complications (p>0,05). There were no deaths.
- Conclusions: RSV is a leading cause of LRTI requiring intensive care in small infants. Although the presence of risk factors didn't influence the outcome, palivizumab is the only prophylaxis available and must be implemented routinely in this group of patients, regarding national guidelines.

ESPID-0613

DIFFERENCES OF ROTAVIRUS GENOTYPES DISTRIBUTION ACCORDING TO VACCINATION STATUS

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Introduction: Rotavirus (RV) is one of the most important viral etiologic agents of acute gastroenteritis (AGE) in children, and effective RV vaccines (RVV) have been used worldwide. However, the emergence of novel genotype and outbreak by rare combination of genotypes has been issued recently.
Objectives: To investigate the genotypes of RV five years after introduction of RVV and the difference of genotypes distribution according to vaccination status or vaccine types.
Methods: We prospectively enrolled children <5 years of age hospitalized with AGE from October 2012 to September 2013 at 9 medical institutions from 8 provinces in Korea. Stool samples were tested for RV by enzyme immunoassay and genotyped by multiplex RT-PCR.
Results: In 346 cases, RV was positive in 114 (32.9%) and 87 cases (76.3%) were single infection. History of RVV-immunization was available in 272 cases; vaccinated in 144 (52.9%) and unvaccinated in 128 (47.1%). In RVV-vaccinated group (n=144), Rotarix in 55 (38.2%), Rotateq in 73 (50.7%), and unknown in 16 cases (11.1%). Detection of RV was 27.8% in vaccinated and 39.8% in unvaccinated group (p=0.035), but there was no difference in clinical severity scores. Among 86 RV genotyped stool samples, 67 samples were aware of vaccination status (Rotateq-20 cases, Rotarix-7 cases, unvaccinated-40 cases). The most prevalent genotype combinations of all those groups were G1P[8] (45.0%, 57.1%, 40.0%).
Conclusions: The incidence of RV AGE was lower in RVV-vaccinated group compared to unvaccinated group, but there was no evidence of substitution by unusual combination or novel genotypes in Korea.

ESPID-0614

MRSA COLONIZATION RATE AND ASSOCIATING FACTORS IN KOREAN CHILDREN

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Instruction

MRSA colonization rate among children attending day care center in Korea was 9.3% in 2009. It is important to monitor MRSA colonization rate and identify risk groups due to high resistance to clindamycin in Korea.

Objectives

To determine MRSA colonization rate and associating factors in Korean children.

Methods

We enrolled 125 children under 18 years of age living in Gangwon province. After obtaining informed consent, nasal swab screening was performed at pediatric outpatient clinic. Nasal swab was plated to blood agar immediately. Identification of MRSA and determination of antibiotic susceptibility were performed by Microscan.

Results

We identified 37 (29.6%) *S. aureus* and 12 (9.6%) MRSA carriers. Age was the only significant factor associated with MRSA colonization. MRSA colonization rate was 31% and 20% among Infants under 3 months of age and school-age children. MRSA were isolated only from 3.3% of children between 3 months and 5 years of age. Demographic characteristics like sex, number of siblings, and living environment were not associated with MRSA colonization. Attending day care center, regular outdoor activity, recent hospitalization of children or their family member and recent use of antibiotics were also not associated with MRSA acquisition. Clindamycin susceptibility among MRSA isolates was only 50%. However, every MRSA isolates were susceptible to trimethoprim-sulfamethoxazole, levofloxacin, vancomycin, daptomycin, and linezolid.

Conclusions

MRSA colonization rate was stable during last 3 years in Korea. However, anti-MRSA treatment should be considered in SSTIs of younger infants and school-age children due to significant colonization rate among those age groups.

ESPID-0615

PROTECTION AGAINST VACCINE PREVENTABLE DISEASES (VPD) AFTER CHEMOTHERAPY FOR ACUTE LYMPHOBLASTIC LEUKEMIA (ALL)

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Introduction: After chemotherapy, children are more susceptible to infections. We assessed the level of protection against VPD in children treated for ALL.

Methods: Clinical characteristics of the children who completed chemotherapy for ALL were collected. Antibodies against VPD were measured after completion of chemotherapy.

Results: 50 children with a median age of 4 years (0-16) at diagnosis of ALL were included. 84% were up to date with their vaccination prior to chemotherapy. VPD antibodies were measured 13 months (1-147) after the end of chemotherapy. The percentage of children who did not achieve protective antibody levels is summarized in table 1. For pneumococcus, only children with prior vaccination with conjugate vaccines were considered; results are summarized in table 2.

Table 1: Percentage of unprotected children against VPD after chemotherapy (N=50)

VPD	Measles	Rubella	Mumps	Varicella	Diphteria	Tetanus	Hib	Polio		
								1	2	3
Protective threshold	> 1,1 ISR	> 1,1 ISR	> 0,2 ISR	> 1,1 ISR	≥ 0.1 UI/ml	≥ 0.1 UI/ml	≥ 1 mg/L	> 1/8		
non protected	31%	45%	70%	42%	58%	56%	66%	23%	29%	41%

Table 2: Percentage of unprotected *vaccinated patients against pneumococcus (N=9)

serotype	1	3	4	6B	7	9V	11	12	14	15	18C	19F	23F	33
% of patients	22	33	44	44	12.5	37.5	55	22	67	33	11	78	44	44

* antibody concentration < 0.35 microg/ml

Conclusions: Protection against VPD is suboptimal in children with ALL. Our findings support the need for a systematic booster vaccination after chemotherapy.

ESPID-0616

CLINICAL OUTCOME OF RESPIRATORY VIRAL INFECTIONS IN CHILDREN WITH CANCER, FEVER AND NEUTROPENIA

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Introduction:The role of respiratory viral infections(RVI) in fever and neutropenia(FN) episodes in children with cancer has been less characterized than bacterial infections. Clinical outcome between different respiratory viruses(RVs) in unknown in this population.

Aims:To compare the clinical outcome of a sole RVI caused by different RVs and comparing a sole RVI versus a respiratory viral co-infection in children with cancer and FN.

Methods:Prospective,multicenter,cohort study in children with cancer and FN admitted to five hospitals in Santiago,Chile between May 2009 and August 2013. Children were evaluated by clinical examination,laboratory tests, bacterial cultures and a nasopharyngeal sample was obtained for the detection of 17 RVs using PCR. Clinical outcome variables were collected.

Results:A total of 578 episodes of FN were enrolled of whom fifty-four percent were male, fourty-nine percent had leukemia as underlying malignancy and the median age was seven years. RVI was detected in 33%. No pathogen was detected in 35% of the episodes, a sole bacterial infection was found in 15%, and mixed viral-bacterial infection in 15%. Most detected RVs were respiratory syncytial virus,rhinovirus,parainfluenza,influenza and bocavirus. Clinical outcome in terms of days of hospitalization,days of fever,days of neutropenia,O_2 requirement, admission to the pediatric intensive care unit and death rate was similar in between different sole RVI's and also when comparing sole RVIs versus co-RVIs.

Conclusions :To our knowledge this is the first report comparing clinical outcome between different RVs causing FN episodes in children with cancer. Our data showed a favorable outcome in all RVI episodes, including sole and co-RVIs.

ESPID-0617

ANALYSIS OF DRUG MANAGEMENT IN PAEDIATRIC CASES OF CORONAVIRUS INFECTIONS

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Background and aims: *Coronovirus* infections have been known to cause a range of illnesses of varying severity, from the common cold to SARS. These viruses primarily affect the upper respiratory tract during the winter season causing fever, cough and sore throat. Lower respiratory tract infection may cause pneumonia. There is currently no established treatment for *coronavirus* infections, although studies suggest ribavirin may be a safe and successful form of treatment in children. However, the recovery of patients may not be dependent on ribavirin administration. Therefore, we analysed all the relevant case reports in order to establish which therapies are successfully employed in the management of *coronavirus* infection.

Methods: We searched MEDLINE and EMBASE databases for all case reports on *coronavirus* infections in children. Each article was then systematically analysed. Details of the duration and management of each individual case were noted. There were no grounds for the exclusion of any cases.

Results: Five case reports were identified detailing 17 individual cases of *coronavirus* infection in children, between the ages of 56 days to 15 years, which eventually resolved. Ribavirin was solely utilised in the management of 4 of these cases, whilst in 5 cases no treatment was given. Different types of broad-spectrum antibiotics were used in the management of the other 8 cases. In most cases, the children were treated under the presumption that they had a bacterial pneumonia before RT-PCR confirmed *coronavirus* infection.

Conclusion: Ribavirin does not appear to have an essential role in the treatment of *coronavirus* infection.

ESPID-0618

NASOPHARYNGEAL COLONIZATION OF STREPTOCOCCUS PNEUMONIA, MORAXELLA CATARRHALIS AND HEAMOPHILUS INFLUENZAE IN KOREAN CHILDREN AT YEAR OF 2012

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Introduction: Nasopharyngeal bacterial flora can cause respiratory tract diseases as well as invasive bacterial diseases. Colonizing *Streptococcus pneumoniae, Moraxella catarrhalis,* and *Haemophilus influenza* in the nasopharynx are considered as important potential pathogens.

Objectives: To investigate colonization rate of *S. pneumoniae*, *M. catarrhalis,* and *H. influenza* of the nasopharyngeal cavity at year of 2012.

Aims: it is to know the change of common pathogens colonized in nasopharynx.

Methods: Nasopharyngeal aspiration samples were collected from children and analyzed with conventional multiplex PCR for *S. pneumonia* and real-time PCRs for *H. influenza* and *M. catarrhalis*.

Results: Three hundred nine samples were analyzed. The colonization rates of *S. pneumonia*, *M. catarrhalis* and *H. influenzae* were 20.4% (n=63), 51.5% (n=159) and 52.1% (n=161). All of *H. influenza* were non-typable *H. influenza* (NTHi). There were co-colonizations: 4.9% of *S. pneumonia* and *M. catarrhalis*, 4.5% of *S. pneumonia* and NTHi, 21.7% of *M. catarrhalis* and NTHi. Incidence of *S. pneumoniae* was increasing 4 months of age, and had the peak at 25-36 months. Emerging of *M. catarrhalis* and NTHi started earlier ages than *S. pneumonia. S. pneumoniae* was prominent in spring and fall. *M. catarrhalis* was more common in winter and NTHi was more common early summer and November.

Conclusions: In Korean children at year of 2012, the major colonized bacteria were *M. catarrhalis* and NTHi. It is needed to monitor further the change of colonization rate and antibiotics susceptibility in these common pathogens in nasopharyngeal cavity.

ESPID-0621

A CASE OF PENICILLIOSIS IN A CHILD WITH ACUTE MYELOID LEUKAEMIA

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Penicilliosis is rare, with *Penicillium marneffei* most reported. *Penicillium citrinum* infections have been reported in cases of mycotic keratitis, chronic sinusitis, pneumonia and pericarditis in adults. We present a paediatric case of invasive *P.citrinum*. SYH is a 2-year-old boy with acute myeloid leukaemia (AML). During induction chemotherapy in another overseas centre in May 2013, he developed probable pulmonary Aspergillosis based on lung nodules on CT and positive broncho-alveolar lavage (BAL) galactomannan antigen (with negative fungal cultures). He received ambisome and voriconazole for 3 months. He was admitted to our centre with relapsed AML in October 2013 and was given a 5th course of chemotherapy. In view of pulmonary nodular opacities on CT, ambisome was commenced. A tender, erythematous skin lesion with necrotic centre developed on his right hand and left calf in November 2013, with no concomitant fever. His serum and BAL galactomannan antigen indices also increased to >10 Ag Index. Ambisome was changed to voriconazole, and caspofungin was added for 10 days. The left calf skin biopsy showed many fungal spores and septated hyphae. Skin culture grew *P.citrinum* –with Minimum Inhibitory Concentration (MIC) in µg/mL as follows: caspofungin 0.016, itraconazole 0.5, amphotericin 1.5, voriconazole > 256. CT Thorax showed a left upper lobe mycetoma. Caspofungin was commenced, and voriconazole discontinued. Rising galactomannan antigen indices were attributed to cross-reactivity of *Penicillium* spp. with galactomannan antigen enzyme immunoassays. With caspofungin, the skin lesions and serial galactomannan antigen indices improved. To our knowledge, this is the first reported paediatric case in literature.

ESPID-0622

MULTIDRUG-RESISTANT KLEBSIELLA PNEUMONIAE MENINGITIS SUCCESSFULLY TREATED WITH INTRATHECAL COLISTIN

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Introduction: Multidrug-resistant (MDR) gram-negative meningitis has become increasingly problematic in recent years. Intrathecal colistin (IT) has been successfully used in some cases.
Aims: To report one case of MDR *Klebsiella pneumoniae* meningitis with ventriculo-peritoneal shunt (VPS) infection effectively treated with IT colistin.
Case Report: Nine months old boy, with a history of neonatal meningitis complicated with tetraventricular hydrocephalus requiring VPS and multiple shunt revisions. He was admitted for meningitis. Cerebrospinal fluid (CSF) cultures were positive for extended-spectrum β-lactamase (ESBL) *Klebsiella pneumoniae*, only sensitive to meropenem and colistin. Intravenous meropenen was started and VPS externalized but CSF cultures remained positive. On day 24 IT colistin (4mg/day) was started through the externalized VPS. CSF white blood cell count improved and cultures became negative. Colistin was stopped after 19 days because of CSF pleocitosis. Meropenen was maintained for a total of 2 months with clinical improvement and no relapse at 12 month follow-up.
Conclusions: In MDR *Klebsiella pneumoniae* meningitis with VPS infection, IT colistin can be considered a safe, effective, and practicable alternative treatment when parental administration fails and shunt removing becomes difficult. Though chemical meningitis could be a concern it reverts after drug ceasing.

ESPID-0623

HEPATITIS B VIRUS INFECTION IN CHILDREN AGED 18 MONTHS BORN TO HEPATITS B SURFACE ANTIGEN CARRIER MOTHERS

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Introduction: Vertical transmission of hepatitis B virus (HBV) is the major cause of chronic HBV infection in endemic areas.

Objectives: This study examined the incidence of HBV DNA in cord blood and the impact of passive-active immunization on the incidence of hepatitis B surface antigen (HBsAg) carriage at age 18 months.

Methods: In Hong Kong, all infants born to HBsAg carrier mothers receive passive-active HBV immunization, with hepatitis B immunoglobulin at birth and three doses of HBV vaccine given at birth, and 1 and 6 months of age, which are all entered in a vaccination record. For this study, asymptomatic pregnant women screened positive for HBsAg were recruited. At delivery, cord blood was collected for the batched assay of HBV DNA (quantitative real-time PCR). The children were followed-up at age 18 months when their HBsAg status was checked and related to the status of cord blood HBV DNA.

Results: The cohort consisted of 120 children with gestational age of 39.1±1.5 weeks (range 31.1-41.4 weeks) and birth weight of 3181±398g (range 1785-3945g). HBV DNA was detected in cord blood in 10.8% infants (13/120), one of whom delivered preterm (<37 weeks). One child had HBsAg but no HBV DNA at age 18 months, who was among those without cord blood HBV DNA (0.9%, 1/107). The overall incidence of HBsAg at age 18 months was therefore 0.8% (1/120).

Conclusions: In-utero HBV infection occurred in 10% of infants born to HBsAg carriers, which can be eradicated by the current program of passive-active immunization.

ESPID-0624

HOST GENOME-WIDE EXPRESSION PROFILES FOR PATIENT STRATIFICATION AND EARLY IDENTIFICATION OF SEPSIS IN CHILDREN WITH CANCER, FEVER AND NEUTROPENIA

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Introduction: Infection and sepsis are the leading cause of mortality in children with cancer,fever and neutropenia(FN).Multiple efforts have been made ??to predict episodes of sepsis in this population,but the results are not satisfactory.

Aim: To determine the value of transcriptome profiling for patient stratification (low versus high risk of serious bacterial infection(SBI)) and to identify,early on the disease course,children who develops sepsis after admission.

Methods: Prospective,multicenter study in children with cancer and FN in six hospitals in Santiago,Chile. Clinical and laboratory evaluations were performed until discharge.Whole blood samples were obtained for cultures and RNA microarray analyses at admission.A blinded evaluator retrospectively classified each episode as sepsis(S+) or no sepsis(S-).

Results: From April-2009 to April-2012, 310 episodes of FN were evaluated.Of those 211 were randomly selected and 44(14%) developed sepsis.We analyzed 20S+ episodes(14 bacteria(+),6 bacteria(-)),40S- and 12 healthy controls,matched for sex,age and race.Gene expression profiles were validated and showed a significant different genomic score(molecular-distance to health;MDTH) between low and high risk FN.Class comparisons ($p<0.01$,x1.25 fold change, Benjamini correction) identified 2417 genes differentially expressed between S+ and S- patients at admission. S+ patients showed a significantly higher MDTH compared to S- patients (2103vs1249;$p=0.02$).

Conclusions: This study demonstrates the potential value of host genome-wide profiles for early stratification (low versus high risk for SBI) and early identification of sepsis in children with cancer and FN, through analysis of one blood sample at admission within a median of 2h of fever. The predictive value of the genomic score could be a valuable complement to current standard clinical/laboratory score.

ESPID-0625

HEPATITIS B SURFACE ANTIGEN CARRIAGE IN TEENAGE MOTHERS – RELATIONSHIP WITH RUBELLA IMMUNITY STATUS

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Introduction: Chronic hepatitis B virus (HBV) infection remains endemic in Hong Kong.

Objectives: This study examined the incidence of hepatitis B surface antigen (HBsAg) carriage in teenage mothers in relation to their rubella immunity status as surrogate for their immunization response.

Methods: In Hong Kong, rubella and HBV immunization were implemented for three decades. This retrospective study examined the age-specific prevalence of HBsAg carriage in 1584 mothers aged ≤19 years managed in 1998 to 2011 and related this to their rubella immunity status.

Results: HBsAg carriage was found in 1.6%, 2.6%, 8.7% and 7.7% for mothers aged ≤16 (n=125), 17 (n=228), 18 (n=460), and 19 (n=771) years respectively (chi square test p=0.002, Spearman's correlation p=0.010). For the rubella non-immune group (n=118), HBsAg carriage was 20.0% (1/5), 0% (0/17), 18.9% (7/37) and 10.2% (6/59) respectively (chi square test p=0.210, Spearman's correlation p=0.935). For the rubella immune group (n=1466), HBsAg carriage was 0.8% (1/120), 2.8% (6/211), 7.8% (33/423) and 7.4% (53/712) respectively (chi square test p=0.004, Spearman's correlation p=0.006).

Conclusions: A significant and progressive increase in the prevalence of HBsAg carriage with advancing age was found in teenage mothers, which was attributed to mothers with rubella immunity. Since rubella and HBV immunity are both induced by immunization, the results suggested a progressive waning of immunity to HBV, hence accounting for the increasing prevalence of HBsAg carriage with age, and despite the persistence of rubella immunity. The role of a booster dose of HBV vaccine in adolescence should be re-examined.

ESPID-0626

NEXT GENERATION MULTIVALENT PRINT NANOPARTICLE PNEUMOCOCCAL VACCINE: A NEW PARADIGM FOR DEVELOPMENT OF CAPITALLY EFFICIENT VACCINES ELICITING POTENT B-AND T-CELL IMMUNE RESPONSES

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Background and Aims: An engineered next generation multivalent PRINT nanoparticulate polysaccharide vaccine for *Streptococcus pneumoniae* which elicits robust serotype and protein-specific antibody and cellular responses is being developed by Liquidia in collaboration with PATH. The PRINT vaccine incorporates select key Prevnar serotypes and pneumococcal specific antigenic carrier proteins/immunogens thereby demonstrating a wide-ranging multi-antigen formulation that could confer broader and enhanced protective immunity (antibody/cellular) against invasive pneumococcal disease and carriage/colonization. Significantly, PRINT approach offers a new paradigm for affordability and flexibility in vaccine design and manufacturing with the potential for improved efficacy and safety profiles to help prevent disease caused by existing and emerging pathogens.

Methods: Preclinical vaccination studies in mice and rabbits (n=6/group) involved S.C and/or I.M immunization of animals on days 1/29/57 (three doses) with defined antigenic PRINT formulations. Immunogenicity endpoints on animal sera included evaluation of serotype specific IgG and functional responses (OPA) calibrated against Prevnar13, protein-specific antibody responses, and induction of IL-17 release from splenocytes on vaccination with PRINT formulations.

Results: Non-adjuvanted single and multivalent PRINT formulations consistently elicited significantly enhanced serotype-specific antibody and functional responses ≥ Prevnar13 across multiple serotypes with multiple carrier proteins in mice and rabbits. PRINT formulations showed enhanced vaccine performance by inducing protein-specific antibody (IgG, neutralizing antibodies) and T-cell responses (IL-17, IFN-g) to the immunogenic carrier proteins.

Conclusions: Precisely defined PRINT nanoparticle formulations elicit anamnestic B- and T-cell immune responses and its wide-ranging multi-antigen formulation flexibility could allow for broadened efficacy, more affordable and simplified manufacturing for generation multivalent particulated pneumoccocal vaccines.

ESPID-0627

CLINICAL AND LABORATORY PROFILES OF CHILDREN AND ADOLESCENTS TYPHOID PATIENTS ATTENDING AN URBAN DIARRHEA HOSPITAL, DHAKA, BANGLADESH

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Introduction: Typhoid is a major cause of febrile illness due to bacterial infections of children and adolescents in most developing countries including Bangladesh. Objective: To evaluate the clinical and and laboratory profiles of children and adolescent patients with typhoid and diarrhea admitted to an urban hospital. Methods: We reviewed the hospital patients records of culture positive (*Salmonella typhi* or *Salmonella paratyphi*) admitted to Dhaka hospital of icddrb from January 2010 to December 2012. Results: In total, 449 typhoid and paratyphoid patients of all age groups were admitted during this period. The age distributions were: 0-5 y (41%); 6-12y (20%); 13-18y (25%); 19-45y (13%). Of these patients 60% were male and 40% female. The mean ±SD of duration (days) of fever and duration of diarrhoea on admission were 6.5±3.9 and 4.6±3.2 respectively. About 8% patients presented with altered consciousness (encephalopathy) and this feature was common in children and adolescents. Half of the patients' stool microscopy have shown invasive picture (stool WBC & RBC > 20cells/HPF. About 30% of patients had hyponatraemia (serum sodium <130 mmol/L). The time of defervescence of fever varied from 1 to 9 days. All the patients were treated with Injection Ceftriaxone. Most (95%) patients were recovered and discharged as usual; 17 patients were referred to other hospitals for complication (renal failure) and 3 died. Conclusion:To conclude that young children are common sufferers of this illness. Complication like typhoid encephalopathy is also common in this population. So, vaccination of children in young age might prevent from this illness.

ESPID-0629

LYME DISEASE ASSOCIATED ACUTE TRANSVERSE MYELITIS

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Background: Lyme disease is a multisystem infectious disease caused by the tick-borne spirochete *Borrelia*. In children with neuroborreliosis the main clinical manifestations are facial nerve palsy and lymphocytic meningitis. One very rare chronic manifestation is acute transverse myelitis (ATM), a focal inflammatory syndrome of the spinal cord. In paediatric patients only a few case reports are documented.

Methods: We describe the case of an 11-year old boy with Lyme disease associated ATM. He presented with a 5-week history of back pain, increased finger-to-floor distance, weight loss, and increased emiction.

Results: Neurological examination on admission revealed slight nuchal rigidity but no other abnormalities. Neuroimaging showed a 12.5 cm long lesion of the thoracic spinal cord (Th_8- L_1). Analysis of CSF showed lymphocytic pleocytosis. Antibodies against *Borrelia burgdorferi* were found both in blood (IgG 644.0 AU/ml, IgM 14.8 AU/ml) and CSF (IgG 2275.0 AU/ml, IgM 42.2 AU/ml). A tick bite was recalled 6 months back without a history of erythema migrans. Other differential diagnosis of ATM were excluded. Due to the serologic evidence Lyme disease was diagnosed and antibiotic therapy (ceftriaxone) was given for 3 weeks.

Conclusions: Lyme disease associated ATM can present with minimal neurological symptoms but severe pathological findings in MRI. Pain is one of the most common initial symptoms reported in children with ATM. For diagnostic work-up in children with unclear symptoms and spinal cord lesions, CSF and serologic analyses are essential.

ESPID-0631

THE EFFECT OF LACTOBACILLUS RHAMNOSUS GG (LGG) AND BIFIDOBACTERIUM LACTIS BB12 ON THE DURATION OF DIARRHEA AND LENGTH OF HOSPITAL STAY IN CHILDREN IN TURKEY

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Objectives and Study: We aim to evaluate the effect of LGG plus BB12 combination on the duration of diarrhea and length of hospital stay in children with acute diarrhea.

Methods: A multicenter, randomized (2:1 for probiotic vs. control) single blind, hospital based clinical trial was performed in 240 children (3 to 120 months) with acute watery diarrhea lasting > 24 but < 72 hours, requiring hospitalization. We enrolled children with mild to moderate dehydration. Children received oral rehydration with or without LGG plus BB12 combination ($1x10^9$ CFU for each) for 5 days. The primary endpoint was the duration of diarrhea (in hours), defined as the first normal stool according to Bristol stool score (score <5). Secondary outcome measures were duration of hospitalization (days) and percentage of children without diarrhea at 72 hours of intervention. Adverse events were also recorded.

Results: In total, data from 218 children could be evaluated: 150 in the probiotic and 68 in the control group. The duration of diarrhea was significantly reduced in the LGG

plus BB12 combination group (74.5 ± 40.8 hours vs. 98.4 ± 22.9 hours, $p<0.001$). After 72 hours, the % of children that was diarrhea-free was significantly larger in the LGG plus BB12 group (%60 vs. 33.8%, $p<0.001$). Mean length of hospital stay was similar for both group (5.03 ± 2.3 days vs. 5.25 ± 1.3 days, NS). No adverse effects related to the probiotic use were noted.

Conclusion: The combination of LGG and BB12 reduces the duration of diarrhea with ~ 24 hours. These results are in line with the reported results in literature for LGG alone.

ESPID-0632

SECONDARY ANTIFUNGAL PROPHYLAXIS IN PEDIATRIC HEMATOPOIETIC STEM CELL TRANSPLANTS

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Introduction: Invasive fungal infections (IFIs) constitute a leading cause of morbidity and infection-related mortality among hematopoeitic stem cell transplant (HSCT) recipients. With the use of secondary prophylaxis a history of IFI is not an absolute contraindication to allo-HSCT. But still, IFI recurrence remains a risk factor for transplant-related mortality.

Aims: It is aimed to investigate results of secondary antifungal prophylaxis to prevent recurrence of a previous IFI or onset of another.

Methods: In this study out of 105 children undergoing HSCT between April 2010 and February 2013, 10 patients who had IFI history before transplantation and were all undergone allo HSCT were evaluated retrospectively.

Results:Secondary antifungal prophylaxis was applied to 10 patients, 6 female and 4 male, aging between 7 and 16 years old (mean: 12.3 ± 3.4 years). As secondary prophylactic agents 5 patients received liposomal amphotericin B and 5 patients received caspofungin. After engraftment secondary prophylaxis was continued with voriconazole orally in 4 patients.

Conclusions:In conclusion in our study amphotericin B and caspofungin was succesfull as secondary antifungal prophylaxis agents with no relapse of IFI.

ESPID-0633

SURVEILLANCE CULTURES AND ITS CORRELATION WITH BACTERAEMIA IN PEDIATRIC PATIENTS IN A TERTARY CARE CANCER CENTRE

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Introduction : Infections with multi drug resistant organisms (MDROs) are associated with substantial morbidity and mortality among children hospitalized in the pediatric ward and increase the length of hospitalization and healthcare costs. *Enterobacteriaceae* carrying extended spectrum β-lactamases(ESBLs) and metallo beta lactamase(MBLs) Vancomycin resistant *Enterococcus* (VRE), methicillin resistant *Staphylococcus aureus* (MRSA) have emerged as significant pathogens in such patients.This requires the development of surveillance systems for monitoring these problems.

Objective : This study was undertaken to determine the extent of prevalence of fecal carriers of multi-drug resistant organisms among pediatric patients and their correlation with bacteraemia.
Methods: A total of 236 fecal samples from 155 patients were processed on MacConkey agar, bile esculin azide agar, and sheep blood agar as per standard microbiological methods. Blood cultures of same patients were also processed on MacConkey agar and sheep blood agar Identification of the organisms and ESBL production was done as per CLSI guidelines.
Results: E.coli (74.5%) was the commonest isolate followed by Klebsiella pneumoniae(12.3%). ESBL positivity was seen more in Klebsiella pneumoniae (51.7%) than E.coli(28.6%). Carbapenem resistance was commonest in Klebsiella pneumoniae (44.8%) followed by E.coli(42.9%). 12 of the 22 patients showing bacteremia, showed same growth as in fecal culture.
Conclusions: Although several studies have been reported on faecal carriage of ESBLs and VRE's in adult patients, there has been very few reports on pediatric patients. Since we have high incidence of ESBLs and VRE's in our hospital, this study was undertaken and requires further investigation.

ESPID-0634

SERO-CONVERSION RATE AFTER POSTNATAL IMMUNOPROPHYLAXIS OF INFANTS OF HBSAG-POSITIVE MOTHERS

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Introduction and Aims :

In India, the HBsAg prevalence rate among pregnant women varies between 0.9% and 11.2% . Vertical transmission of hepatitis B has grave consequences .There is very little data on the efficacy of immunoprophylaxis in infants of HbsAg-positive mothers in India.

The study was carried out to assess the efficacy of immunoprophylaxis with hepatitis B immunoglobulin given at birth and three doses of HBV vaccine at 0 , 6 weeks and 6 months in the prevention of vertical transmission of Hepatitis B infection .

Material and Methods :

It was a prospective study in Sri Ramachandra Medical College And Research Centre ,Chennai, INDIA over 7 years . Term infants born to HBsAg positive mothers were included with parents consent. They received immunoprophylaxis with HBIg and 3 doses of vaccine at birth , 6 weeks and 6 months and were followed up .

Results : During the 7 year period , 141(1%) mothers were found to be HbsAg-positive. Out of these , 70 babies(49%) completed follow. 90 % had adequate levels of anti HbsAg antibodies . HbsAg testing was advised for 6 children with nil antibodies. One was HbsAg-positive (2%), four were negative(6%) and one did not consent to be tested(2%). Four HbsAg negative children were re-vaccinated. AntiHbs Ab level checked 2 months from the third dose was protective (>10mlU/L).

Conclusion : AnitiHbsAg antiboby titres should be checked in all babies born to HbsAg positive mothers after immunoprophylaxis. The unprotected should be revaccinated after checking HBsAg status.

ESPID-0635

CARRIAGE OF BACTERIAL RESPIRATORY PATHOGENS IN THE 7TH YEAR AFTER IMPLEMENTATION OF PNEUMOCOCCAL VACCINE: RETURN TO THE PRE-VACCINATION EQUILIBRIUM

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Background: After implementation of 7-valent pneumococcal conjugate vaccine (PCV7), *Streptococcus pneumoniae* serotypes targeted by PCV7 were replaced in nasopharyngeal carriage by non-vaccine serotypes (NVTs), with particularly high peaks in serotype 19A carriage in children 4.5 years post-PCV7 (Spijkerman,2012). Moreover, increased carriage rates of *Staphylococcus aureus* and *Haemophilus influenzae* were observed in children and parents (Van Gils,2010; Spijkerman,2012). In fall/winter season of 2012-2013, we performed a cross-sectional study to investigate long-term effects of vaccination on nasopharyngeal carriage of bacterial pathogens seven years post-PCV7 implementation and 1.5 years after PCV7 replacement by the 10-valent pneumococcal conjugate vaccine.

Methods: Nasopharyngeal carriage rates of *S. pneumoniae, S. aureus, H. influenzae*, and *Moraxella catarrhalis* were determined in 330 PCV7-vaccinated 24-month-old children and their parents, and 330 PHiD-CV10-vaccinated 11-month-old children using conventional culture. Results were compared with data from studies conducted before, 3 and 4.5 years after PCV7 implementation.

Results: Carriage rates of serotype 19A had declined from 12% to 9% in 11-month-old children and from 14% to 8% in 24-month-old children between 2010 and 2013. With no serotype exceeding a carriage rate of 10% distribution of pneumococcal serotypes in 2012/2013 was more even and resembled serotype carriage in pre-PCV7 period. Also, the *S. aureus* carriage in 11-month-old children and parents of 24-month-old children declined and returned to pre-PCV7 rates. Carriage of *H. influenzae* and *M. catarrhalis* remained high after PCV-implementation.

Conclusion: Our data may reflect emerging of a new balance in the interplay between NVTs pneumococci, and other co-habitants of the nasopharyngeal niche.

ESPID-0636

HEARING LOSS: CAN IT BE NEUROBRUCELLOSIS?

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Introduction: Central nervous system is rarely involved brucellosis. It may present with a wide spectrum of neurological manifestations.

Case: A 15 years-old girl defined bilateral tinnitus that appeared 9 months ago as a first distinct complaint. She lost hearing gradually and was given a 3 courses of methylprednisolone pulse therapy. She was referred to pediatric emergency room because of a progressive gait disturbance and increase in fatigue, appeared on the fourth day of this therapy. On neurological examination, she had nuchal rigidity, ataxic gait, dysmetria and intentional tremors on bilateral hands. CSF examination revealed low glucose (16 mg/dl), high protein (823 mg/dl), 346 lymphocytes/mm^3 and 91 polymorphonuclear leucocytes/mm^3. Cranial MRI showed widespread contrast enhancement of leptomeningium, from the periphery of the lateral ventricles to the lumbar area. On detailed history the patient approved the consumption of a special kind of fresh cheese. Serologic tests confirmed the diagnosis of neurobrucellosis: serum agglutination test (SAT) was 1/80, serum Coombs' agglutination test, carried out to detect blocking antibodies by using anti-human gamma globulin sera was 1/320; CSF agglutination test was 1/40, CSF Coombs' agglutination test was 1/160. She was treated with doxycycline, rifampicin and gentamicin. On follow up, all clinical abnormalities were completely resolved other than bilateral sensorineural hearing loss.

Conclusions: Clinicians serving to patients from endemic areas of Brucellosis should be aware of its atypical clinical presentations. This is a report indicating importance of the need to include serological tests for brucellosis in the routine diagnostic screening for SNHL in endemic areas.

ESPID-0637

TRENDS IN THE PREVALENCE OF NASAL CARRIAGE WITH METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS AMONG DIABETIC OUTPATIENT POPULATION IN TURKEY, 2005 AND 2013

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Introduction: Diabetes mellitus is a risk factor for methicillin-resistant *Staphylococcus aureus* (MRSA) colonization and infection. We attempted to determine the changing prevalence of MRSA nasal carriage in a pediatric population of outpatients with diabetes.

Methods: This prospective study enrolled children with diabetes. Anterior nares cultures were obtained from patients with diabetes admitted to outpatient endocrinology department, and prevalence for MRSA colonization were analyzed in 2005 and 2013.

Results: A total of 235 patients (101, 42.9% in 2005 and 134, 57.1% in 2013) were enrolled the study. According to years; age, sex distribution, daycare or school attendance, hospitalization in the previous year, length of hospital stay, use of antibiotics in the previous 3 months, flu vaccination status, duration of DM, HbA1C level and smoking status at home were similar. The prevalence of colonization with MRSA was 0.9% in 2005 and 0.7% in 2013 (P>0.05).

Conclusion: The prevalence of MRSA colonization in our sample of diabetic outpatients was extremely low in different years. Despite the increase in colonization of MRSA all over the world, it does not seem a major problem in diabetic population.

ESPID-0638

BACTEREMIA AMONG FEBRILE PAEDIATRIC PATIENTS WITH MALIGNANCY ADMITTED AT MUHIMBILI NATIONAL HOSPITAL FROM JUNE 2012 TO JANUARY 2013

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Introduction : Bacteraemia is the presence of microbes (bacteria) in the blood with significant clinical consequences that include fever, chills, hemodynamic instability and compromise. Limited data is available on complications of infections in Paediatrics oncology patients in Tanzania. Where bacteraemia has been studied and published,evidenced based treatment is needed for better management.
Objectives : To determine the prevalence of bacteraemia, aetiological agents and antimicrobial susceptibility patterns among paediatric patients with malignancies presenting with fever attending Muhimbili National Hospital in Dar es Salaam, Tanzania.
Aims : Determine the antimicrobial susceptibility patterns of isolated bacterial agents
Methods : Descriptive hospital-based cross sectional study conducted from June 2012 to January 2013 among paediatric patients with malignancy who presented with temperature ≥ 37.5°C(WHO definition of fever) .
Results : 145 patients met inclusion criteria and recruited into the study, of which 70 (48.3%) were male and 75(51.7%) were females, 60 (41.5%) were less than 5 years old while 85 (58.6%) were 5 to 18 years old. 70 (48.3%) children had blood stream infections. The common aetiological agents were Coagulase negative staphylococcus (CoNS) 36 (51.4%), *Staphylococcus aureus* 8 (11.4%), Klebsiella spp 12 (17.1%) and *Escherichia coli* 7(10%). The microorganisms isolated were resistant to ampicillin 70(100%), cloxacillin 65 (92.9%), gentamycin 49(70%) and moderately resistant to ceftriaxone 38(54.3%). Of the bacteria organisms isolated, 92.6% were sensitive to amikacin and vancomycin. Fever was the independent predictor of blood stream infections.
Conclusions: Fever in paediatric patients with malignancies should be investigated thoroughly .CoNS should not be regarded as contaminants but potential pathogen.

ESPID-0639

HEALTHCARE WORKERS COMPLIANCE WITH HAND HYGIENE PROGRAM IN PEDIATRIC INTENSIVE CARE UNIT CIPTO MANGUNKUSUMO HOSPITAL JAKARTA

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Introduction. Transmission of microorganism from the hands of healthcare workers is the main source of cross infection in hospitals and can be prevented by hand hygiene (HH).

Objective. To determine the compliance with HH guidelines among healthcare workers in PICU CMH .

Methods. Observasional study in PICU CMH. All doctors, nurses and paramedical staff in the PICU were included.

Results. In 3226 observed opportunities for HH, overall compliance was 51.7% where 57.4% of it was perform properly. In multivariate analysis, doctors noncompliance was higher during prosedures that carry a high risk (aOR 1.48; 95% CI 1.01 to 2.18; P= 0.047), low risk for contamination (aOR 5.61; 95% CI 3.69 to 8.50; P= 0.000). Hand hygiene compliance was significantly worse following glove use (aOR 3.08; 95% CI 1.55 to 6.15; P= 0,001). Nurses noncompliance was higher during prosedures that carry a high risk (aOR 2.62; 95% CI 2.09 to 3.27) P= 0.000), low risk for contamination (aOR 3.74; 95% CI 2.98 to 4.69); P= 0.000), and when intensity of patient care was low (OR 1.30; 95% CI 1.05 to 1.61; P= 0.015). Nurses noncompliance was also higher on weekdays (aOR 1.4; 95% CI 1.16 to 1.70; P= 0.001), morning shift (aOR 1.75; 95% CI 1.42 to 2.17;P=0.000), and when they use glove for patient care (aOR 2.81; 95% CI 2.05 to 3.87; P= 0.000). Paramedical staff noncompliance was higher on weekdays (aOR 3.11; 95% CI 1.17 to 5.67; P= 0,000), night shift (aOR 2.15; 95% CI 1.003 to 4.61; P= 0.049), and when using a glove (aOR 8.83; 95% CI 2.91 to 26.80; P= 0,000).

Conclusions. Hand hygiene compliance need improvement. Further study to find the causality between healthcare workers compliance and the factors that associated is needed.

ESPID-0640

MYCOPLASMA PNEUMONIAE INFECTION – DIFFERENCE IN CLINICAL FEATURES ACCORDING TO AGE GROUPS

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Background and aims: *Mycoplasma pneumoniae* is a common etiologic agent of pneumonia in children. Our aim was to study the difference in the clinical features of this infection between pre-schoolers and school-aged children.

Methods: We conducted a retrospective study of 52 children admitted to a paediatric emergency department over a five and a half year period (January 2008 to June 2013) with respiratory symptoms and seropositivity to *M. pneumoniae*, comparing the clinical, laboratorial and radiographic features according to two age groups: ≤ 5 years of age (29 patients) and > 5 years (23 patients).

Results: We analyzed and compared the duration of symptoms prior to the diagnosis, the presence of respiratory symptoms and signs (cough, rhinorrhea, chest pain, wheezing, hypoxemia and other signs of respiratory distress as well as findings on pulmonary auscultation), extra-pulmonary manifestations (fever, myalgias, ear pain, vomiting, diarrhea and abdominal pain), laboratory findings (white blood cell and platelets count and C-reactive protein) and radiological pattern in both groups and found that the only statistically significant data was the presence of chest pain, that was more frequently reported in school-aged children ($p<0.05$).

Conclusions: Unlike what has been previously reported, we found no significant difference in the clinical presentation and evaluation of *M. pneumoniae* pneumonia in pre-schoolers and school-aged children.

ESPID-0641

CLINICAL EFFICACY AND SAFETY OF ERTAPENEM IN CHILDREN: FOLLLOW-UP IN A TURKISH UNIVERSITY HOSPITAL

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Introduction:The carbapenems are β-lactam-type antibiotics with a broad spectrum of activity involving coverage of Gram-positive and -negative aerobes and anaerobes. The first carbapenem to be identified in the mid 1970s was thienamycin, meropenem was the second carbapenem released for clinical use. Ertapenem with superior pharmacokinetics was developed thereafter. It has broad-spectrum activity, including aerobes and anaerobes, and is resistant to nearly all β-lactamases.

Objective: It is aimed to evaluate clinical efficacy and safety of ertapenem in an outstanding of tertiary referral center of pediatrics from all over the country.

Design/methods: We studied 100 patients that were treated with ertapenem between April 2009 and August 2012. Efficacy was determined by the clinical response and microbiologic cure rates achieved with ertapenem.

Results: Out of 100 patients treated with ertapenem with a mean 9.3± 3.8 days 89% had urinary tract infection (UTI), 7% had complicated soft tissue infection (STI), 1% had peritonitis and 1% had pneumonia. Extended spectrum beta lactamase (ESBL) producing *E. coli* was isolated in 64% of the patients, ESBL *K. pneumoniae* was isolated in 13%, ESBL *K. oxytoca* was isolated in 2%, *E. aerogenes* was isolated in 1%, *E. faecalis* was isolated in 1%, no microorganisms could be isolated in 19%. Microbiologic cure was observed in 70% of the patients, clinical cure in 22%, relapse in 6% and undeterminable outcome was present in 2%.

Conclusion: Favorable microbiologic cure and clinical response rates are achieved in patients treated with ertapenem. This data suggests that ertapenem is well tolerated and has good clinical efficacy in children.

ESPID-0642

EARLY LACTIC ACIDOSIS WITH LINEZOLID THERAPY IN PEDIATRIC PATIENTS

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Introduction: Linezolid is a new class oxazolidinone antibiotic used to treat a spectrum of gram-positive infections, including those due to methicillin-resistant staphylococci and vancomycin-resistant enterococci (VRE). In paediatric clinical trials, the frequency of possible linezolid-related adverse events ranged from 18.8% to 25.6%. The most common were gastrointestinal disturbances, headache, rash and liver function alterations. Metabolic adverse such as lactic acidosis which might especially be important in pediatric age group was rarely reported due to linezolid.
Aim: We planned to analyze the safety and adverse effects especially rarely reported ones such as lactic acidosis and safety of linezolid in children at a university hospital.
Methods:At our university hospital a total of 50 children receiving linezolid therapy for at least 3 days were evaluated retrospectively.
Results: As side effects 16% (8) of the patients had lactic acidosis, 16% lactic acidemia alone, 11 patients (22%) had detoriation in liver function tests (LFT) and 11 patients had detoriation in kidney function tests (KFT), 8 had anemia, 4 patients had thrombocytopenia (8%) and 1 patient had bicytopenia. Therapy was efficient (microbiologic and/or clinical cure) in 78% (39) patients, 11 patients had worsening in symptoms or relapses of underlying condition.
Conclusion: Linezolid is considered generally safe and effective in literature but but special attention could be helpful to notice early developping side affects such as lactic acidosis.

ESPID-0643

SERIOUS COMPLICATIONS OF VARICELLA IN AN INFANT: A CASE REPORT

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Introduction:

Hospitalization of patients with varicella is most commonly due to complications. The most commonly encountered complications of varicella that require hospitalization are skin/soft tissue infections, bone/joint infections, sepsis, pneumonia and dehydration.

Case:

A 10-month-old girl with a 4-day history of varicella was admitted to state hospital with vomiting and diarrhea. With deterioration of consciousness, patient was transferred to our Pediatric Intensive Care Unit. Physical examination showed respiratory distress, hypotension, tachycardia and high fever. Plasmapheresis was administered due to severe sepsis, coagulopathy and multiple organ failure. Soft tissue necrosis and hemorrhages on extremities defined as purpura fulminans were dressed daily. Two weeks later, pulmonary hemorrhage developed. One month following admission to hospital, limb pain, swelling and movement restriction of left elbow were realized and conventional X-ray showed joint destruction of the elbow affecting the metaphyseal bone of distal humerus and common periosteal reaction. Magnetic resonance imaging of the elbow revealed massive inflammation of the joint, prominent periosteal thickening around humerus. Intraoperatively, massive necrotic debris and seropurulent fluid were found around the periosteum of humerus and removed. Arthrocentesis from elbow showed abundant polymorph nuclear leucocytes and cultures were negative. Intravenous treatment with teicoplanin was started and continued for 2 weeks. Patient was discharged and oral clindamycin was given for a further two months. And X-ray of left elbow showed no further radiological findings and recovery was proved.

Conclusions:

Although varicella vaccination program was introduced recently in Turkey, varicella infections still should be paid attention in infants in terms of complications.

ESPID-0644

PERTUSSIS OUTBREAK IN SCOTLAND 2012-2013: IMPACT OF PERTUSSIS VACCINATION IN PREGNANCY

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Introduction: A national pertussis outbreak started in 2012 continuing throughout 2013. During 2012, 1926 laboratory confirmed cases of *Bordetella pertussis* were reported to Health Protection Scotland, a 16-fold increase compared to 119 reports in 2011. Incidence remained high in 2013 with 1178 confirmed cases.

Objectives & Aims: To describe the outbreak among infants and the impact of a vaccination programme for pregnant women.

Methods: In October 2012 a national immunisation programme was introduced for pregnant women, ideally at 28-38 weeks gestation, aiming to provide passive immunity to infants during the first few weeks of life prior to their own immunisations. A point of delivery audit was conducted in maternity units in January 2013 to estimate vaccine uptake.

Results: Vaccine uptake among pregnant women was high 78.1%.

In 2012, there were 140 confirmed cases in infants < 1 year, accounting for 7.2% of all confirmed cases; an incidence of 235.7 per 100,000, (compared to 36.8 per 100,000 across all ages). In 2013, the provisional number of confirmed cases in infants <1 year decreased to 19, accounting for 1.6% of all confirmed cases, an incidence of 32.0 per 100,000 (22.6 per 100,000 across all ages).

For 13 /19 infant cases in 2013, information was available on whether the mother received pertussis immunisation whilst pregnant, 10 were unvaccinated and three vaccinated.

Conclusion : The over 85% reduction in incidence among infants is an indication of the immunisation programme effectiveness in reducing disease in those most susceptible to complications.

* data for 2013 is still provisional.

ESPID-0645

PRIMARY INTRAMUSCULAR HYDATIDOSIS: A RARE CASE OF PRESENTATION IN A CHILD

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Case report

A 12 years-old Spanish boy is admitted for a left paraspinal lumbar mass. It was soft and painful at physical examination, no previous trauma was referred. The parents noted the mass one week before the admission.

Blood test was normal except eosinophilia (660/mm3). A lumbar ultrasonography showed a cystic image (78x57 mm) of well-defined wall, which seemed to derive from adjacent paravertebral conjunction hole. The study was completed with magnetic resonance imaging (MRI) (Image 1), suspecting an arachnoid cyst.

A complete excision was performed by neurosurgeons without incidence.

The characteristic scolices of *Echinococcus granulosus* were observed in the pathological study. Serological test was negative. We review the MRI checking that the intramuscular cyst was no communicating with the meninges. Thoracic radiography, abdominal ultrasonography and cerebral-spinal MRI ruled out the presence of cysts in these locations. After surgery the patient was treated with albendazole.

Discussion

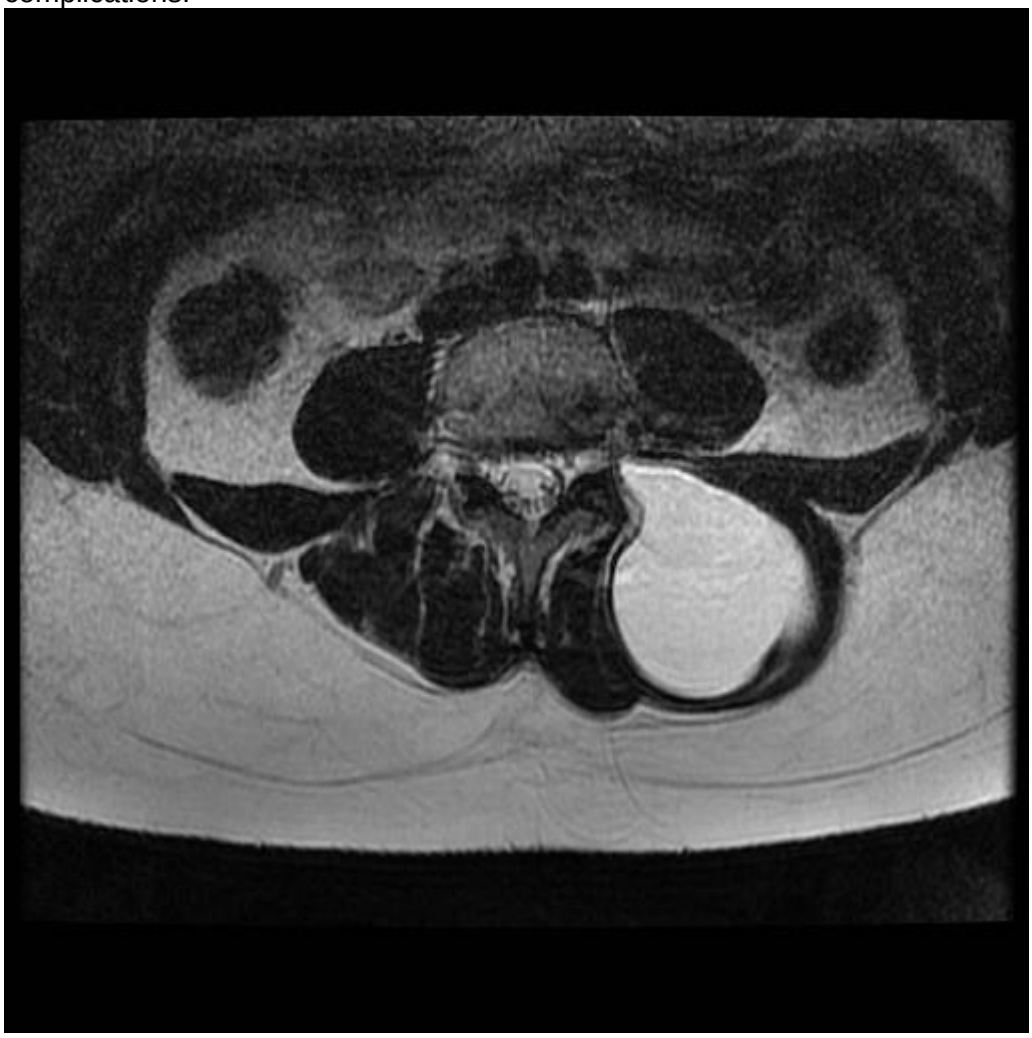
This case is a primary muscular hydatidosis a very rare presentation of this disease, especially in children (1-4% of all hydatidosis).

Although liver or lung hydatidosis should be ruled out, muscle cysts are usually isolated lesions.

Serology is usually negative and MRI is the gold standard for diagnosis. Treatment consists of an enlarged muscle resection associating albendazole preoperative and for 3 months after surgery.

Although muscular hydatidosis is rare, it should be included in the differential diagnosis of muscular cyst since any invasive diagnostic measures may lead to fatal

complications.



ESPID-0646

PAROTITIS IN A CHILD INFECTED WITH INFLUENZA A SUBTYPE H3N2 VIRUS

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Background and aims : The most common cause of acute parotitis in childhood is mumps infection (parotitis epidemica). Rarely influenza A virus have been reported like causal agent for acute parotitis.

Methods : We will describe the case of a 10-years-old girl with acute parotitis and influenza admitted in Dr V Babes Clinical Hospital of Infectious and Tropical Diseases, Bucharest in March 2009. In this clinical facility, 106 patients were diagnosed with influenza during 2008/2009 season, out of which 50 were hospitalized.

Results : The patient was admitted with fever, chills, dry cough, that started 3 days before; laboratory tests revealed leukopenia and elevated amilasemia (251U/L). Two days later left sided facial swelling installed. Serological ELISA testing for mumps infection was positive for IgG and negative for IgM antibodies. The throat swab for bacterial culture was negative. Positive diagnosis for influenza from nasal swab was based on reverse transcription- PCR and viral isolation in MDCK cell cultures and was negative for influenza B virus and positive for influenza A subtype H3N2 virus. The patient's mother was also tested and was positive for influenza A subtype H3N2 virus. The evolution was favorable with supportive treatment.
Conclusions : The clinical manifestations of influenza can be atypical. Influenza infection should be considered in the differential diagnosis of acute parotitis.

ESPID-0647

DEVELOPMENT OF E-LEARNING MATERIAL FOR SCHOOL-BASED PREVENTIVE EDUCATION ON INFECTIOUS DISEASES AND MATHEMATICAL SIMULATION OF INFECTIOUS DISEASES

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Introduction: Outbreaks of pediatric infectious diseases, such as pertussis occur among adolescents. These diseases have become a particular social problem and focus of research recently.

Objectives: Health education has been important to prevent pertussis outbreak, and we have been providing preventive education on infectious diseases in a school. We aimed to develop highly effective e-learning material for prevention of pertussis infection in schools.

Methods: E-learning material: We developed educational material using animation. Simulation of inflectional diseases: We made stimulator of infectious disease. We used SIR model and differential equation following, $dS(t)/dt=-\beta S(t)I(t)$, $dI(t)/dt=\beta S(t)I(t)-\gamma I(t)$, $dR(t)/dt=\gamma I(t)$ (S: susceptible, I: infected, R: recovered) to the simulate outbreak.

Results: E-learning material: We made an animation of basic data related to structure of Bordetella pertussis, mechanism of infection of Bordetella pertussis, diagnosis criteria of pertussis, treatment of pertussis, and vaccination against adolescent pertussis that students could easily understand. Simulation of inflectional diseases: We made a student-manipulatable simulator based on the quantitative analysis of pertussis outbreak to perform computer simulation of outbreak.

Conclusions: We developed highly effective e-learning material for infection prevention in schools. In accordance with the learners' interest, the learner could select the amount of learning and learning contents. In the teaching materials, the learner could self-learn about changing pattern of pertussis outbreak by operating parameters in the graph.

ESPID-0648

A NATIONAL POINT-PREVALENCE SURVEY OF NEWBORN INTENSIVE CARE UNIT-ACQUIRED, NECROTIZING ENTEROCOLITIS IN TURKEY

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Objectives: Necrotizing enterocolitis (NEC) is a serious condition, predominantly observed in premature infants. We conducted a national multicenter assessment of NEC in NICUs to determine the prevalence of infections, describe of associated risk factors.

Study design: We conducted a point prevalence survey of NEC in 38 NICUs. Patients present on the survey date were included. Data on demographics, underlying diagnoses, therapeutic interventions/treatments, infections, and outcomes were collected for all NICU patients.

Results: A total of 933 patients in 38 NICUs participated in the study, 39 of whom had NEC, corresponding to a prevalence of 4,2%. The stage of NEC patients were reported as 14 patients (35,8%) stage 1, 16 patients (41%) stage 2 and 9 patients (%23) stage 3. Causative microorganisms were isolated in seven (7,6%) patients with NEC. This pathogens were *Klebsiella pneumoniae* (3 infections, 12,9%) coagulase negative Staphylococcus (CoNS) (2 time infections, 5,1%), and *Candida spp*. (2 infections, 5,1%). The risk factors for NEC were total parenteral nutrition (TPN), gestation age ≤ 32 week and previous surgical operation. At 4-week follow up, 33 (3,5%) patients had died. NEC were found to be risk factors for death (p=0,017).

Conclusion: NEC is the second most common type of healthcare-associated infections in our study. The most common risk factors associated with infections were TPN, gestation age ≤ 32 week and surgery amplications. NEC was found to be a risk factor for mortality in NICUs. Preventive strategies for these infections should be considered as a health-politics priority.

ESPID-0649

DOES THE NUMBER OF BOOSTERS AND THE DIAGNOSTIC METHOD INFLUENCE THE NOTIFICATION OF PERTUSSIS?

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Background and aim: Because of the increase of pertussis during the last decade school-entry and -leaving booster doses were added to the Estonian immunisation schedule and the qualitative serologic test was replaced by the quantitative tests. We aimed to estimate how these changes influenced the incidence of officially reported pertussis.

Methods: Pertussis cases registered between 01.01.2004 to 31.12.2013 were derived from the databases of the Health Board and analysed in three time periods (Table 1). The incidence risk ratio with 95% CI-s for comparable periods of moderate endemic activity was calculated.

Results: During moderate endemic periods there was a significant decrease in notification of pertussis (2012-2013 vs 2004-2007) in all age cohorts covered by immunisation. This decrease was double in age groups with added booster doses and quantitative serology as compared to those with quantitative serology only (Table 1). In non-immunised cohort (adults) the notification rate remained unchanged despite of diagnostic method.

Table 1: The yearly incidence of officially notified pertussis per 100 000 population depending on disease activity, immunisation and serologic tests.

	2004-2007	2008-2011	2012-2013	Incidence risk ratio (95% CI)
Management	DTPw+qualitative serology	DTPa+qualitative serology	DTPa+quantitative serology	
Age (years)	moderate endemic	epidemic	moderate endemic	2012-2013 vs 2004-2007
<1	39.3*	58.6*	13.9*	0.4 (0.1-1.0)
1-4	82.2*	185.0*	33.3*	0.4 (0.3-0.6)
5-9	95.7	166.6*	22.7*	0.2 (0.2-0.3)
10-19	63.4	169.0	13.5*	0.2 (0.2-0.3)
>20	4.4	23.3	4.5	1.0 (0.8-1.3)

*cohorts covered by immunisation

Conclusions: In Estonia single sample qualitative serologic tests are not suitable to diagnose pertussis in children, but could be used in adults. Introduction of school-entry and -leaving booster doses with acellular pertussis vaccine significantly reduced symptomatic pertussis in children, but did not result in complete elimination of disease in the population**.**

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ESPID-0650

A NATIONAL POINT-PREVALENCE SURVEY OF NEWBORN INTENSIVE CARE UNIT-ACQUIRED, HEALTHCARE-ASSOCIATED BLOOD-STREAM INFECTIONS IN TURKEY

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Objectives: Patients admitted to neonatal intensive care units (NICUs) are at high risk of Healthcare-Associated Blood-stream Infection (HABSI). We conducted a national multicenter assessment of HABSI in NICUs to determine the prevalence of infections and describe associated risk factors.

Study design: We conducted a point prevalence survey of HABSI in 38 NICUs. Patients present on the survey date were included. Data on demographics, underlying diagnoses, therapeutic interventions/treatments, infections, and outcomes were collected for all NICU patients.

Results: A total of 933 patients in 38 NICUs participated in the study, 142 of whom had HABSI, corresponding to a prevalence of 15,2%. The reported HABSI were clinical sepsis (n = 88, 61,9%), laboratory-confirmed bloodstream infection (n = 50, 35,2%) and catheter related infection (n = 4, 2,8%). Causative microorganisms were isolated in 54 (38%) patients with HABSI. The risk factors for HABSI were total parenteral nutrition, nasogastric feeding tube, central venous catheter, absence of High Efficiency Particulate Air, gastrointestinal system disease, carrying out the preventive application bundle for catheter related infections, absence of next to each incubator disinfectant, duration of hospitalization more than 2 days and post-natal age more than 30 days. HABSI were not found to be risk factors for death (*p>0,05*).

Conclusion: Blood stream infections are the most common type of healthcare-associated infections. Clinical sepsis is the most common subtype of blood stream infections reported in NICUs. The most frequent pathogens were CoNS and *Candida spp*. Preventive strategies for these infections should be considered as a health-politics priority.

ESPID-0651

A NATIONAL POINT-PREVALENCE SURVEY OF NEWBORN INTENSIVE CARE UNIT-ACQUIRED, LOWER RESPIRATORY TRACT INFECTION IN TURKEY

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Objectives: Patients admitted to neonatal intensive care units (NICUs) are at high risk of Healthcare-Associated Infections (HAIs). We conducted a national multicenter assessment of Healthcare-Associated Lower Respiratory Tract Infection (HALRTI) in NICUs to determine the prevalence of infections, describe of associated risk factors.

Study design: We conducted a point prevalence survey of HALRTI in 38 NICUs. Patients present on the survey date were included. Data on demographics, underlying diagnoses, therapeutic interventions/treatments, infections, and outcomes were collected for all NICU patients.

Results: A total of 933 patients in 38 NICUs participated in the study, 30 of whom had HALRTI, corresponding to a prevalence of 3,2%. The reported HALRTI were ventilator-associated pneumonia (VAP) (n =23, 76,6%), pneumonia (n=4 13,3%) and lower respiratory tract (n = 3, 10%). The most frequent causative pathogens were *Klebsiella pneumoniae* (n=4, 13,3%), *Enterobacter cloacae* (n =2, 6,6%), *Serratia marcescens* (n =2, 6,6%) and *Acinetobacter baumanni* (n =2, 6,6%). The risk factors for HALRTI were mechanical ventilation, absence of HEPA and post-natal age more than 30 days. HALRTI were not found to be risk factors for death (*p>0,05*).

Conclusion: HALRTI were the third most common type of healthcare-associated infections in our study. VAP was the most common subtype of HALRTI. The most frequent causative pathogen was *Klebsiella pneumoniae*. The most common risk factors for HALRTI were mechanical ventilation, absence of HEPA and post-natal age more than 30 days. Preventive strategies for these infections should be considered as a health-politics priority.

ESPID-0653

ANTIBODY RESPONSES TO CONSERVED BACTERIAL PROTEINS DIFFER BETWEEN INDIGENOUS AND NON-INDIGENOUS AUSTRALIAN CHILDREN WITH OTITIS MEDIA - IMPLICATIONS FOR VACCINATION?

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Background and aims: Some children are prone to recurrent and severe otitis media (OM) particularly Indigenous Australian children. The aim of this study was to investigate differences in naturally acquired serum antibody responses to nontypeable *Haemophilus influenzae* (NTHi) and *Streptococcus pneumoniae* proteins in Indigenous and non-Indigenous otitis prone children.

Methods: Serum samples from 32 healthy non-indigenous children, 64 Caucasian children and 55 Indigenous children undergoing surgery for OM were for specific IgG and IgA antibody against pneumococcal proteins Ply, CbpA, PspA1 and 2 and NTHi proteins PD, P6 and P4, using a multiplex bead based assay.

Results: Indigenous children had higher levels of IgA than their non-Indigenous counterparts with OM (PspA1, CbpA, Ply and P6). No differences were observed for most IgG (Ply, CbpA, PspA 1 and 2, P6 and P4) between healthy controls, Indigenous OM children and non-Indigenous OM children. Despite high levels of NTHi exposure, Indigenous children had the lowest geometric mean concentration of PD IgA and IgG (10927AU and 92967AU respectively), when compared to both non-Indigenous otitis prone children (16399AU, 168384AU) and healthy non-Indigenous controls (11464AU, 335709AU).

Conclusions: Despite increased susceptibility to severe recurrent OM Indigenous children mount similar or increased antibody responses to most conserved NTHi and pneumococcal antigens tested when compared to their non-Indigenous OM prone children and healthy controls. Indigenous children with OM and their non-Indigenous counterparts, appear to have deficient PD IgA and IgG responses. This could have major implications when considering vaccination with the new PD containing pneumococcal conjugate vaccine.

ESPID-0654

NOROVIRUS HOSPITALIZATION IN GERMANY WELL REFLECTED IN FEDERAL DATABASE

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Introduction/Objectives: Noroviruses (NoVs) are an important cause of diarrhoeal hospitalization in children, replacing rotavirus as the main cause in countries where rotavirus vaccination has been introduced. With a NoV vaccine in late stage clinical development, it becomes important to estimate the burden in order to inform public health decision-making. In Germany, DESTATIS (the German Federal Statistics Office) registers all hospitalizations in the country.
Aims: We aimed to compare the estimates of NoV disease burden derived from the literature with the number of NoV hospitalizations reported to DESTATIS.

Methods: Data for patients aged < 10 years with ICD-10 codes A08-A09 (primary diagnosis) was extracted from DESTATIS for the period 2005-2010. A literature review was performed of studies providing incidence data for NoV hospitalizations in high income countries published in the last 10 years.

Results: According to DESTATIS, there was an average of 7,365 NoV hospitalizations in Germany among children < 10 years every year. The age standardized rate was 8.86 per 10,000 children. We found only two studies reporting the incidence of Norovirus hospitalization. These estimated incidence rates of 7 in the US and 33 in Israel per 10,000 children < 5 per year.

Conclusion: NoVs cause up to more than 7,000 hospitalizations every year in German children < 10 years according to German federal data. This is in line with the few published estimates from other high income countries. The DESTATIS database may provide useful insight into the burden of Norovirus hospitalisations in Germany.

ESPID-0655

A NATIONAL POINT-PREVALENCE SURVEY OF NEWBORN INTENSIVE CARE UNIT-ACQUIRED, HEALTHCARE-ASSOCIATED INFECTIONS IN TURKEY

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Objectives: Patients admitted to neonatal intensive care units (NICUs) are at high risk of Healthcare-Associated Infections (HAIs). We conducted a national multicenter assessment of HAIs in NICUs to determine the prevalence of infections, describe of associated risk factors.

Study design: We conducted a point prevalence survey of HAIs in 38 NICUs. Patients present on the survey date were included. Data were collected on underlying diagnoses, therapeutic interventions/treatments, infections, and outcomes.

Results: A total of 933 patients in 38 NICUs participated in the study, 220 of whom had one or more HAI, corresponding to a prevalence of 23.5%. The most frequently reported sites were blood-stream (n = 142, 64,5%), lower respiratory tract (n = 30, 13,6%) and gastrointestinal tract (n = 39, 4,2%). The most frequent pathogens were coagulase negative Staphylococcus (CoNS) (38 infections, 40,8%), *Klebsiella pneumoniae* (12 infections, 12,9%) and *Candida spp*. (10 infections, 10,7%). The risk factors for HAI were total parenteral nutrition (TPN), mechanical ventilation, nasogastric feeding tube, peripherally inserted central venous catheter, absence of HEPA filter, duration of hospitalization more than two days and postnatal age more than 30 days. Gastrointestinal system infection, TPN, mechanical ventilation and accompanying co-morbid factors were found to be risk factors for death.

Conclusion: This study documents the high prevalence of HAIs in NICUs. The most common risk factors associated with infections were TPN, mechanical ventilation, nasogastric feeding tube, central venous catheter, absence of HEPA filter, duration of hospitalisation. Preventive strategies for these infections should be considered as a health-politics priority.

ESPID-0656

THE IMPACT OF A PAEDIATRIC OUTPATIENT PARENTERAL ANTIBIOTIC THERAPY (P-OPAT) SERVICE IN A CHILDREN'S HOSPITAL IN THE UNITED KINGDOM

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Background: Paediatric OPAT (p-OPAT) allows children to receive intravenous antibiotics at home, with potential benefits for patients and families alongside significant cost saving for the healthcare system. Ensuring safe, high-quality care requires a formal framework involving a multidisciplinary team in conjunction with appropriate clinical governance structures. In recent years, many adult OPAT services have been developed across the UK. In contrast, no such service was previously available to children.

Methods: A p-OPAT service was introduced at Southampton Children's Hospital (SCH) in July 2012. SCH serves a regional population of approximately 500,000 children. The p-OPAT team consists of paediatric infectious diseases consultant time and a specialist nurse. Patients eligible for p-OPAT were identified on antimicrobial stewardship ward-rounds, and either formally managed by the p-OPAT service if they had central venous access (p-OPAT patient) or ambulated under the guidance of the OPAT team (p-OPAT-assisted). This study evaluated the impact of the Southampton p-OPAT service between July 2012 and December 2013.

Results: 112 patients were managed over an 18-month-period (67 p-OPAT, 45 p-OPAT-assisted), resulting in 1214 hospital bed-days saved, equating to an estimated £250,000 cost saving per year. The majority of patients had osteoarticular infections (51%). The most frequently used antibiotic was ceftriaxone (81%). Only 3 (4%) p-OPAT patients required readmission (2 infection related, 1 unrelated seizure).

Discussion: These results show that p-OPAT offers a safe and effective way of managing children at home on intravenous antibiotics. In addition, p-OPAT has the potential to deliver significant cost savings for the healthcare service.

ESPID-0658

THE USE OF PERIPHERALLY-INSERTED-CENTRAL-CATHETERS IN CHILDREN RECEIVING HOME INTRAVENOUS ANTIMICROBIAL THERAPY WITHIN PAEDIATRIC OUTPATIENT PARENTERAL ANTIBIOTIC THERAPY (P-OPAT)

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Background

Peripherally-Inserted-Central-Catheters (PICC) for paediatric inpatient therapy is safe, effective and common practice. However, limited data are available regarding their use for home intravenous antibiotics. This study evaluated the clinical safety and efficacy of PICC use for children being managed by the p-OPAT service at a regional children's Hospital.

Methods

Prospective study of all PICC inserted in children managed with home intravenous antimicrobial therapy under p-OPAT service supervision over a 17-month-period (July-2012 to December-2013).

Results

A total of 54 PICC were inserted in 53 patients. All PICC were placed using aseptic technique, with 91% placed in theatre. The total number of catheter-related complications was 6 (11.1%). All complications were mechanical, comprising of 1 blockage, 1 line-fracture, 2 accidental-dislodgements and 2 line-migrations. There were no instances of catheter-related infections. Only one patient required readmission for a second PICC for intravenous therapy, with the remaining 5 cases being changed to oral antibiotics for completion of their treatment.

Discussion

These results demonstrate the effectiveness and safety of PICC in the management of children within a p-OPAT service. This contrasts with findings from previous studies that observed PICC-related complication rates in up to 35% of cases. The low incidence of complications within a dedicated p-OPAT service, without catheter-related infections, indicates that PICC are a suitable and reliable form of intravenous-access for children in the home setting.

ESPID-0659

INVASIVE PULMONARY AND CEREBRAL INFECTION WITH ASPERGILLUS FUMIGATUS - CASE REPORT

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Introduction and aims: Pulmonary aspergillosis is a rare disease diagnosed in immunosuppressed patients or patients with preexistent pulmonary pathology. Hypersensibility syndromes, saprophyte noninvasive disease and invasive disease are three of the pathogenic aspects of this disorder.

Methods: The authors present a case of invasive aspergillosis (pulmonary and cerebral localization) in an immunosuppressed child. The diagnosis was established on clinical data and was confirmed by imagistic methods (pulmonary radiographs, pulmonary and cerebral CT-scan) and bacteriologic data (Aspergillus fumigates was isolated in broncho-alveolar secretions).

Results: One patient aged 17 years, known with autoimmune cirrhosis, splenectomy and corticosteroid treatment was admitted for bilateral pneumonia with rapid foul evolution. In 7 days, the patient developed multiple pulmonary abscesses, extensive pulmonary necrosis, piopneumothorax with no regression under antibiotherapy. Aspergillus fumigatus was isolated in broncho-pulmonary secretions. After 2 weeks of evolution the patient presented with right motor deficiency and right facial paresis, and cerebral CT-scan examination revealed multiple cerebral and cerebellar abscesses suggestive for cerebral aspergillosis. The patient received antifungal therapy (Voriconazol) with favorable evolution of the pulmonary and cerebral lesions, but with decompensation of the hepatic disease as collateral side effect. After 2 months the patient died by variceal bleeding.

Conclusions: Invasive aspergillosis is a severe opportunistic infection with very rapid evolution in immunosuppressed patients. The diagnosis and treatment are extremely difficult in these conditions.

ESPID-0660

THE ARPEC ANTIMICROBIAL WEB-BASED POINT PREVALENCE SURVEY: EVALUATION OF PAEDIATRIC CEFTRIAXONE PRESCRIBED DOSES IN HOSPITALS WORLDWIDE

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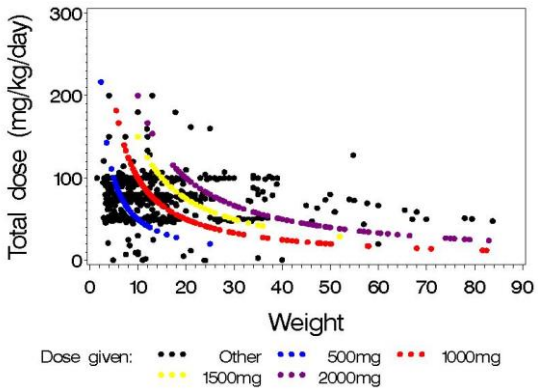
Background: Ceftriaxone is an antibiotic with broad-spectrum activity against Gram-positive and -negative bacteria. The blue book recommends a 50mg/kg/day dose in children, which is increased to 80mg/kg/day in case of meningitis and severe infections.

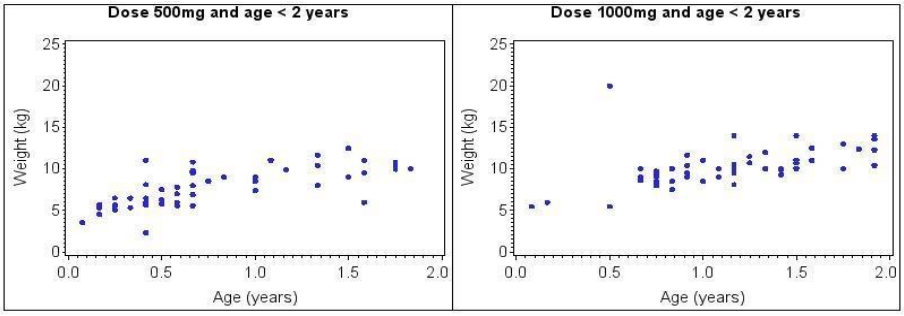
Methods: As part of the Antibiotic Resistance and Prescribing in European Children (ARPEC) project, we extracted 980 ceftriaxone prescriptions administered to children >1 month from the ARPEC-Point Prevalence Survey database. Exploratory plots were used to study the prescribed dose. Adherence to guidelines was evaluated using existing guidelines (British National Formulary for Children, Blue Book and Red Book) and ARPEC definitions for severity of the reason for treatment.

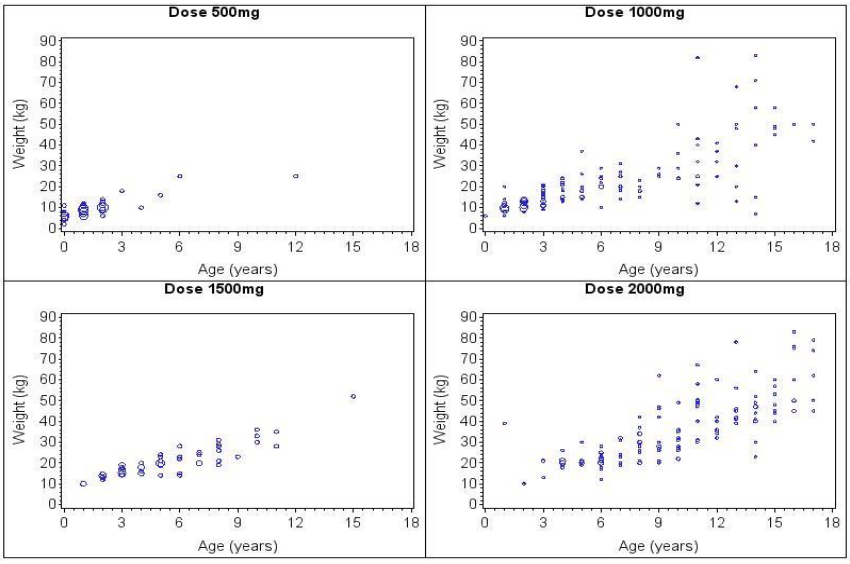
Severity	Reason for treatment
Severe	sepsis, central nervous system infections, cardiac infections, febrile neutropenia/fever in oncologic patients, catheter related bloom stream infections
Non-severe	surgical disease, prophylaxis, respiratory tract infections, acute otitis media, urinary tract infections, skin/soft tissue infections, joint/bone infections, pyrexia, gastrointestinal infections, other/unknown

Results: The plot of total dose versus weight (shown below) illustrates that 450 patients do not get doses according to their weight but driven by vial sizes (colored lines).



In this subgroup plots of weight versus age for different doses (shown below), with circle size proportional to the number of patients with similar age and weight, illustrate that ceftriaxone vials are commonly prescribed according to age.





Adherence to guidelines seems poor with only 17% of patients receiving the exact recommended dose and 34% receiving recommended dose +/- 5mg.

Conclusions: Ceftriaxone prescription does not follow guidelines and is driven by vial size and age rather than weight.

ESPID-0661

ROTAVIRUS GENOTYPES IN A TERTIARY PAEDIATRIC CARE HOSPITAL

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Background

Rotavirus infections are the major cause of severe diarrhoea in young children. The dominant rotavirus genotypes infecting humans are P[8]G1, P[8]G3, P[8]G4, P[8]G9 and P[4]G2. We assessed pre-vaccination genotype distribution in a population with high prevalence of underlying chronic diseases, to determine if approved rotavirus vaccines are well matched to rotaviruses circulating in this population at high risk for severe and complicated disease**.**

Methods

This retrospective observational study was performed in a paediatric tertiary care centre in the Netherlands between 2006 and 2010. Rotavirus gastroenteritis was confirmed by ELISA, subsequent genotyping was performed by sequencing the VP4 and VP7 genes of RT-PCR products.

Results

Out of 259 hospitalized children with rotavirus gastroenteritis, stool samples were available for genotyping in 113 (44%); RT-PCR results were negative in 8 samples (7%). Sixteen patients (14.2%) were born premature or small for gestational age and 83 (73.5%) suffered from a complex chronic condition. Sixty-eight infections (60.2%) were community-acquired and 45 (39.8%) nosocomial. Genotyping was successful for VP7 genes in 89 (79%) and for VP4 genes in 88 samples (78%). G[1] (n=54) and P8 (n=76) were the most frequent G and P types identified. G[9] and P4, both not covered in the available vaccines were identified in 10 and 12 samples, respectively. Only 1 patient was identified with a fully heterotypic strain G[9]P4.

Conclusion

Within this small study, genotype distribution in a population with high prevalence of underlying disease was well matched to genotypes covered by available rotavirus vaccines.

ESPID-0662

CARRIAGE AND ANTIBIOTIC RESISTANCE OF PNEUMOCOCCI ISOLATED FROM THE NASOPHARYNGEAL FLORA OF CHILDREN WITH ACUTE OTITIS MEDIA BEFORE AND AFTER 13VALENT PNEUMOCOCCAL CONJUGATE VACCINE ERA

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Objectives & Aims: To evaluate in France, carriage and antibiotics resistance of pneumococci isolated from the nasopharyngeal flora, in children with acute otitis media (AOM) before and after 13 valent pneumococcal conjugate vaccine (PCV13) era.

Methods: From 2006 to 2012, 66 pediatricians have enrolled children 6 to 24 months with AOM and performed nasopharyngeal specimens. Two periods were defined Pre-PCV13 before June 2010 and Post-PCV13 after June 2010.

Results: Of the 6280 children enrolled (median age 13 months), over 99% were PCV vaccinated including 2483(39.5%) by PCV13 in Post-PCV13 period. Among them 43.8% attended in day care center and 45.5% had received ATB within 3 months before inclusion (cephalosporins, 17.8% and amoxicillin clavulanate, 18.0%). Between Pre-PCV13 and Post-PCV13 period pneumococcus carriage decreased from 57.9% to 55.1%, and pneumococcal strains with reduced susceptibility to penicillin (RSP) decreased from 46.3% to 38.5% (P<0.0001). The 6 additional PCV13 serotype isolates expressed a RSP in 583 (68.0%) cases, their number fell from 648(18.5%) in the Pre-PCV13 to 211(7.6%) in the Post-PCV13 period (P<0.0001). In multivariate analysis, risk factors for carriage RSP strain were: day care center (OR 1.5, 95% CI [1.3, 1.8]), ATB within 3 months (OR 1.8, 95% CI [1.6, 2.1]). At the reverse Post-PCV13 period was associated with a decreased risk of RSP carriage (OR 0.7, 95% CI [0.6, 0.8]).

Conclusion: Our data suggest a reduction in the carriage of RSP pneumococcal strains in the Post-PCV13 period among children with AOM mainly due to the decrease of additional PCV13 serotype isolates.

ESPID-0663

CLINICAL AND GENETIC FEATURES OF HUMAN METAPNEUMOVIRUS INFECTIONS WITH DIFFERENT SEVERITY IN HOSPITALIZED CHILDREN

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Introduction: Human metapneumovirus (hMPV) is one of main pathogen causing respiratory tract infection in children. **Objectives:** We aimed to identify clinical and genetic features of severely presented hMPV infection. **Methods**: From 2011 to 2013, nasopharyngeal aspirates were obtained from children admitted to Chung-Ang University Hospital and tested for the hMPV by reverse transcription polymerase chain reaction assay. The genotype of the hMPV was identified by PCR-restriction length polymorphism analysis for fusion gene. Clinical features of the hMPV infection were compared between high fever (HP) and lower fever (LP) groups. **Results**: Among the 8,586 samples tested during the study period, 456 (5.3%) were positive for the hMPV. We could identify the genotype of 400 (87.7%) hMPV; of these, A2a was identified in 97 (24.3%), B1 in 186 (46.5%), and B2 in 117 (29.2%) isolates. We classified 80 subjects to the HP group and 82 subjects to the LP group. Mean absolute neutrophil count (5625±4418 vs. 4072±3076/μL) and C-reactive protein level (2.39±3.39 vs. 0.96±1.77 mg/dL) were higher in the HP group (p=0.01, in both). Wheezing (31.7% vs. 5.0%) and dyspnea (14.6% vs. 2.5%) were more frequently seen in the LP group (p<0.01, in both). The genotype distribution was similar in the two groups. **Conclusions:** hMPV-infected children with high fever showed elevated level of inflammatory markers, and those with low fever or afebrile were more frequently accompanied with wheezing and dyspnea. No significant difference was found between the two groups in terms of genotype and other clinical manifestations.

ESPID-0666

EPIDEMIOLOGICAL ASPECTS AND ANTIBIOTIC SENSITIVITY OF STREPTOCOCCUS PNEUMONIAE IN CHILDREN RESPIRATORY DISEASE, THE EXPERIENCE OF A ROMANIAN HOSPITAL

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Introduction: Acute respiratory disease is the most frequent reason for admission in a pediatric department. Streptococcus pneumoniae (SP) infection is present in a large number of cases.

Aims: This study aimed to investigate the epidemiological characteristics of patients admitted with acute respiratory disease and SP infection and the antibiotic sensitivity.

Methods: We performed a retrospective study, including patients hospitalised from January 2011 to December 2013 with respiratory disease and SP infection in 'Grigore Alexandrescu' Emergency Children's Hospital, Bucharest; we evaluated: personal data, time of admission (year, month), discharge diagnosis, positive cultures for SP and SP sensitivity.

Results: 480 patients had a positive culture for SP, 2% of 31696 patients hospitalised in this period. The sex ratio was male/female=1.5/1. We had 162, 179 and 139 cases in 2011, 2012 and 2013 respectively. The maximum incidence was recorded in November (11.2%). In the majority of cases the SP was isolated in the nasal secretions (85%) followed by otic cultures (5%). 18 cases were diagnosed with SP pneumonia (positive tracheobronchial aspirates or pleural liquid cultures). The SP isolated was highly resistant to: Penicillin, Erythromycin, Trimetoprim and Clindamycin in 87, 75, 74.3 and 60 % of cultures respectively. A good sensitivity was recorded with Levofloxacin, Vancomycin and Cefotaxime (100, 99.3, 75%). In addition 35 healthy patients were nasal carriers of SP.

Conclusions: SP is one of the important etiologies of pediatric respiratory disease, with important prevalence in pediatric populations. The sensitivity spectrum reveals significant antibiotic resistence (Penicillin, Erythromycin, Trimetoprim and Clindamycin).

ESPID-0667

HOSPITALIZATION WITH VARICELLA AND SHINGLES BEFORE AND AFTER INTRODUCTION OF GENERAL CHILDHOOD VARICELLA VACCINATION IN GERMANY

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Background:

In Germany, varicella vaccination is recommended for children aged <24 months with one (two) dose(s) since 2004 (2009) to reduce varicella-related disease burden. We assessed data on varicella- and shingles-associated hospitalization before and after vaccine introduction to quantify the impact of varicella vaccination at country-level.

Methods:

ICD-coded hospital discharge data from the Federal Bureau of Statistics on the number of varicella- (ICD9-052, ICD10-B01) and shingles-cases (ICD9-053, ICD10-B02) in 1995-2012 were analyzed.

Annual age-adjusted, age- and gender-specific hospitalization incidences (HI) were calculated per 100,000 population. Trends of HI were assessed and means were compared for the pre- and post-vaccination period (1995-2003 vs. 2005-2012).

Results:

Overall, age-adjusted varicella-HI decreased from 3.3 pre- to 1.9* post-vaccination. The age-specific varicella-HI decreased by age-group, and differed among children aged <1year, 1-4, 5-9 and 10-14 years in pre-(post-)vaccination period: 42.6 (16.5)*, 21.8 (8.2)*, 5.6 (3.5)*, and 1.2 (1.1). HI was higher in males than in females in all ages and both periods.

Age-adjusted shingles-HI increased continuously from 8.6 (1995) to 16.5 (2012). The age –specific shingles-HI increased by age and differed among children aged <1 year, 1-4, 5-9, and 10-14 years in pre-(post-)vaccination period: 1.8 (1.0)*, 2.6 (2.0), 2.2 (3.5)*, and 2.7 (4.5)*. HI was on average higher in females than in males.

(*significant pre-/post-vaccination difference)

Conclusions:

Varicella-vaccination reduced significantly varicella-related hospitalizations in children below 10 years. A decrease of shingles in children of vaccination-eligible age seems possible but is not significant. An increase of shingles-HI in older children and adults began before vaccination was introduced.

ESPID-0668

PAEDIATRIC INVASIVE PNEUMOCOCCAL DISEASE IN BELGIUM: IMPACT OF PNEUMOCOCCAL CONJUGATE VACCINES

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[3]Study group, Belgian IPD Scientific Committee, Brussels, Belgium

In 2007, PCV7 was implemented for infants (2+1 schedule) with a catch-up for <2y olds, and was substituted with PCV13 starting from July 2011. PCV uptake (3rd dose) was estimated at 89-97% (2012). We present changes in IPD incidence, clinical presentation and serotype distribution during PCV7 implementation (2006-2011) and early impact of PCV13 (2011- 2012).

Methods

IPD cases were identified through the national reference centre and paediatrician's surveillance network “PediSurv”. Capture–recapture allowed estimating the total number of cases.

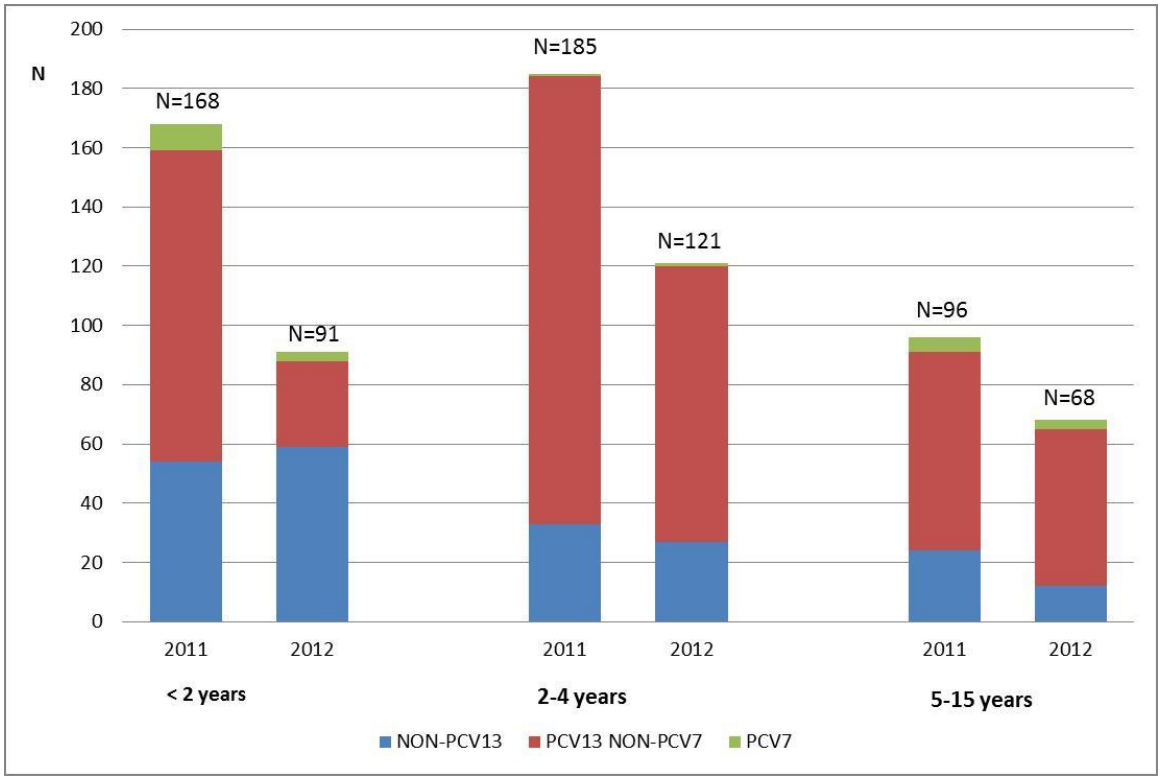
Results

Period 2006-2011: IPD-rates decreased in children < 2y from 124.3/100,000 to 90.8/100,000 (-27%; 95%CI 4-44%), but increased in 2-4y olds from 40.5/100,000 to 74.7/100,000 (+83%, 95%CI 25-168%). IPD-rates attributable to PCV7-serotypes decreased significantly, while non-PCV7-serotype rates increased. In 2-4y olds, a significant increase in invasive pneumococcal pneumonia was noted from 21.0/100,000 to 47.3/100,000 (+226%, 95%CI 135-378%), with most common serotypes: 1 (42%), 5 (12%) and 19A (9%).

Period 2011-2012: the 6 additional PCV13 serotypes decreased by 31% (95%CI 19-43%) in children < 2y old (Figure 1).

Conclusions

PCV7 implementation resulted in a significant decrease in IPD in the target group, but simultaneously a significant increase in IPD, mainly pneumonia, was noticed in 2-4y olds. Based on the preliminary favourable impact of PCV13 introduction, a significant decrease in incidence of IPD and of pneumococcal pneumonia can be expected in following years.


N
200
180
160
140
120
100
80
60
40
20
0
N=168
N=91
N=185
N=121
N=96
N=68
2011
2012
2011
2012
2011
2012
< 2 years
2-4 years
5-15 years
NON-PCV13
PCV13 NON-PCV7
PCV7

ESPID-0671

OUTBREAK OF ENTEROVIRAL MENINGITIS IN ESTONIA AND LATVIA DURING SUMMER 2013

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Background and aim: Outbreaks of enteroviral meningitis in Europe are common during the summer months. We aimed to describe clinical findings and course of aseptic meningitis during an outbreak in two Baltic countries in summer 2013 caused by echovirus type 30.

Methods: Hospital records of all PCR-confirmed enteroviral meningitis cases admitted to Riga Children Clinical University Hospital and to Tartu University Hospital Children`s Clinic during May - October 2013 were retrospectively reviewed.

Results: A total of 122 children, 91 from Tartu and 31 from Riga were reviewed. Median age was 10.0 years (IQR 7.0; 13.9) and 65% were boys. Outbreak started in the end of May and peaked in July. Most common symptoms were headache (100%), *followed by* fever (93%) and vomiting (75%). Meningeal signs were positive in 90% of patients. The mean pleocytosis was 182.8 x 10^9/l (range 9 - 1250).CSF protein level was increased in 22% of cases. Strain identified by cell culture was echovirus type 30. 7 (6 %) patients had positive PCR with normal CSF WBC count and protein. The median duration of hospitalization was 3.3 days (IQR 1.9; 4.0) being 2.0 days (IQR 1.0; 2.0) in Estonia and 8.0 days (IQR 5.0; 9.0) in Latvia ($p < 0.0001$). 93% and 61% of children accordingly received pain and/or parental rehydration therapy. All children recovered completely.

Conclusions: During this outbreak, hospitalization for enteroviral meningitis increased several fold. Most of hospitalized children were of moderate severity and required parental rehydration therapy because of dehydration or refusal to drink.

ESPID-0672

PREVALENCE OF HUMAN PAPILLOMAVIRUS IN ORAL/OROPHARYNX CAVITY IN HEALTHY UNIVERSITY STUDENTS FROM 18 TO 25 YEARS OF AGE IN VALENCIA, SPAIN

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Background and aims

Human papillomavirus (HPV) is a common sexual transmitted infection. High risk (HR) HPV genotypes have been associated with a subset of head and neck cancers. The natural history of this oral infection remains unclear.

Our aim was to determine the prevalence in healthy university students from 18-25 years, none vaccinated for HPV, in Valencia, Spain.

Methods

Cross sectional study was performed on 454 healthy students (255 male and 199 female) in Valencia, in 2013. Samples were obtained after 30 seconds of mouth washing and gargling with saline solution. HPV detection and typing was based on PCR followed by an essay of detection of the virus by hybridation, carried out using HPV SPF10 PCR-DEIA-LiPA25 assay (DDL, Diagnostic Laboratory). Positive results were considered as oral infection. All subjects signed an informed consent. The study was approved by the Ethical Committee of the institution.

Results

HPV oral infection was present in 7.04% (95%CI, 4.69%-9.39%), 62.5% male vs. 37.5% female. Of those, the genotype was determined in 62.5% of samples. Genotype remained unidentified by LiPA25 in the rest of samples. HR HPV genotypes (-16,-18,-31,-33,-45, -51,-52,-56,-66) were found in 75% and low risk or unclassified HPV (-34,-44,-74), in 25% of samples. Co-infections were present in 30%.Genotypes HPV-31 or/and HPV-51 were found in 83.3% of the co-infections. The most prevalent genotypes were HPV-18 and -51.

Conclusions

About 7% of university students had an HPV oral infection, with no differences in gender. The result is in concordance to literature. HR genotypes were frequently present.

ESPID-0673

LONG TERM PRESERVATION OF DATA IN VACCINE CLINICAL TRIALS: THE ENSURE PROJECT

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Introduction and Objectives:

Our society generates and receives an enormous amount of data which must be stored. In clinical trials, by law, it is mandatory to retain the information for an increasing period of time.

For so many years, paper was the way to store data and although efforts have been directed to a digitalization, there is a need to guarantee the usability of this digital format over and beyond the legal required time in a secure and cost-efficient manner.

Methods**:**

Within the 7th Framework Programme, FISABIO participates as the European Centre of Excellence for Research in vaccines providing advice on programme needs, suggesting scenarios and uses within clinical trials or other healthcare activities, and also putting forward solutions about which documentation should be stored and how, all in accordance with the GCP, giving particular attention to the preservation of the confidentiality of the data in the virtual space.

Results:

The project has succeeded in establishing the system requirements for the Clinical Trials framework, as well as the standards used. The aim is to obtain a system that, while ensuring the preservation of data, facilitates their collection for subsequent reviews, including meta-analysis.

Conclusions:

After three years of the project, the ENSURE programme will have a computer system focused on the pharmaceutical industry, to ensure the preservation of long-term data, and also the facilitation of its use. This system will improve costs and the lifetime of the information, guaranteeing sensitive data protection and confidentiality in the world of clinical trials.

ESPID-0674

TREATMENT PROTOCOLS FOR ANTIBIOTIC PRESCRIPTIONS IN NEONATES SHOULD BE EVIDENCE-BASED: A FRENCH NATIONAL SURVEY

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Objective: This survey aims to analyse the dosage regimens of antibiotics in French neonatal intensive care units (NICUs).

Methods: The senior doctors from 56 NICUs were contacted by telephone and/or email to provide their local protocols for antibiotic therapy.

Results: 79% of NICUs agreed to participate to this survey. : 407 dosage regimens for 39 intravenous antibiotics were included in the protocols. The number of dosage regimens varied from 2 to 32 per drug and 37 % used an uniform mg/kg dose for all neonatal age groups. Doses and/or dosing intervals varied significantly for 12 antibiotics (amikacine, gentamicin, netilmicine, tobramycin, vancomycin in continuous infusion, ceftazidime, cloxacillin, oxacillin, penicillin G, imipenem/cilastatin, clindamycin and metronidazole). Among these antibiotics, 6 were used in more than 70% of local guidelines. There are significant variations in the maintenance daily doses for amikacin, imipenem/cilastation, ceftazidime and metronidazole, the loading doses for continuous infusion vancomycin, dose intervals for gentamicin and amikacin.

Conclusion: A considerable inter-center variability of dosage regimens of antibiotics exists in French NICUs. The development of evidence-based dosage regimen of antibiotics on the basis of developmental pharmacokinetics-pharmacodynamics is required in neonates.

ESPID-0676

PERTUSSIS IN CHILDREN ATTENDED TO A PAEDIATRIC HOSPITAL, 2007-2013

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Introduction: Pertussis is a highly contagious disease that may occur at any age. Humans are the only pertussis reservoir and it has re- emerging in the recent years. Most cases of serious diseases are observed in early infancy. The aim of the present study was to assess the incidence of pertussis among children admitted in Pequeno Principe Hospital (PPH) a pediatric quaternary hospital in south of Brazil.

Methods: Between 2007 and 2013 all pertussis suspected cases were investigated by the Epidemiology and Infection Control Department (EICD). Diagnostic test used were culture and polimerase chain reaction (PCR) of nasopharyngeal specimen. Diagnostic criteria to confirm pertussis were lab test and or clinical- epidemiologic data. We analyzed confirmed pertussis cases, age, year and outcomes.

Results: In this 7 years of surveillance, 856 suspected cases were investigated, 293 cases (34.22%) were confirmed, with an increase proportion of confirmed cases in 2012 and 2013 (251; 85.66%).The prevalent age group of confirmed- cases was under 1 year age (246; 83.95%), 55.29 %(162) female and 6 (2.04%) deaths occurred in the study period. All death-cases occurred in children under 4 months of age. The EICD intensified the control measures: isolation of hospitalized patient, antimicrobial postexposure prophylaxis and has encouraged health care professionals to immunize with Tdap vaccine.

Conclusions: pertussis in early infancy showed high morbidity and mortality. We observed an increase of cases in the last two years. Re-emerging of this infection is a reality and the vaccine is the mainly measure for the prevention.

ESPID-0677

BED OCCUPANCY FOR ROTAVIRUS GASTROENTERITIS IN TWO FINNISH HOSPITALS BEFORE AND AFTER THE IMPLEMENTATION OF THE VACCINATION PROGRAM WITH ROTATEQ

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Introduction: Rotavirus gastroenteritis (RVGE) coincides with other common childhood epidemics like bronchiolitis and influenza every year and is responsible for a yearly average of 87,000 hospitalizations in Europe. Overlap of these epidemics causes an increased risk for seasonal hospital overcrowding harboring the potential for nosocomial infections and negative adverse effects on the overall quality of patient care.

In Finland, the national immunization program with the pentavalent rotavirus vaccine Rotateq® was introduced in 2009, reaching coverage rates >90%.

Aims: Aim of the study was to describe the benefit of the national vaccination program with Rotateq to avoid situations of seasonal hospital overcrowding by comparing numbers of bed-days for RVGE in the post versus the pre-vaccination period.

Methods*:* Retrospectively collected hospital discharge data were used to calculate the number of bed-days for RVGE before and after the introduction of the immunization program.

Results*:* An important decrease in the number of beds-days for RVGE was observed in the post-vaccination compared to the pre-vaccination period.

Period	Years	Tampere		Oulu	
		Children 0-16 years	Children 0-2 years	Children 0-16 years	Children 0-2 years
Pre-vaccination period	2001-2006	193.6*	146.6	219.4	161.0
Transition period	2006-2009	174.7	115.3	92.7	57.0
Post-vaccination period	2009-2012	28.0	12.3	46.7	29.3
% reduction [95%CI]	post-vacc. period vs. pre-vacc. period	**86 [82-88]**	**92 [88-94]**	**79 [75-82]**	**82 [77-85]**

*mean number of bed-days for RVGE per RV season

***Conclusions**:* The study highlights the substantial impact of the national vaccination program with Rotateq® on the reduction of the number of bed-days for RVGE. As a consequence, it is expected that RV vaccination increases quality of care by allowing a better management of other winter epidemics as bronchiolitis or influenza.

ESPID-0678

EPIDEMIOLOGY OF IMPETIGO IN INDIGENOUS CHILDREN IN REMOTE NORTHERN AUSTRALIA: RESULTS FROM A RANDOMISED CONTROLLED TRIAL

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Background and Aim: Impetigo affects >111 million children worldwide at any time. Indigenous children in remote Australia have the highest reported rates of impetigo in the world. Before their first birthday, >80% of children will be diagnosed with impetigo, with median (IQR) 3 (2 – 5) clinic visits. We describe the epidemiology of impetigo in Australian Indigenous children compiled in a non-inferiority, randomised controlled trial.

Methods: We randomly assigned 508 children with purulent or crusted skin sores aged 3 months to 13 years, over 663 visits, to receive either intramuscular benzathine penicillin G BPG (n= 165) or one of two short courses of oral trimethoprim/sulphamethoxazole (SXT) (n=343). Skin assessments on days 0, 2 and 7 included digital images and microbiological swabs.

Results: The median (IQR) age was 7.1 (4.8 – 9.4) years as recruitment was school-based. There were 12/508 (2.4%) participants <1year. At baseline, participants had a median (IQR) of 3 (1 – 4) involved body regions. 73% had 2 or more purulent or crusted sores and 17% had more than 10 total body sores. Impetigo was located on the face and scalp in 10%, trunk/groin and buttocks 7%, upper limbs 25% and lower limbs 58%. While 17% had scabies, rates for tinea (4%) and pediculosis (9%) were lower.

Outcome	Overall	BPG	SXT
Enrolled >1 time (only eligible >90 days from last randomization)	155/663 23%	57/222 26%	98/441 22%
Median (IQR) body sites with purulent or crusted sores at baseline	3 (1 -4)	2 (1 – 4)	3 (1 – 4)
Participants with ≥2 purulent or crusted sores at baseline	370/508 73%	119/165 72%	251/343 73%
<5 total body sores	198/508 39%	65/165 39%	133/343 39%
5-10 total body sores	225/508 44%	79/165 48%	146/343 43%
>10 total body sores	85/508 17%	21/165 13%	64/343 19%
Successful treatment at Day 7	416/490 84.9%	133/156 85.3%	283/334 84.7%

Conclusion: Impetigo in Australian Indigenous children is severe and prevalent. Scabies, tinea and pediculosis are common. Non-inferiority of SXT to BPG for impetigo has been demonstrated.

ESPID-0679

LONG-TERM OUTCOME OF EARLY TREATED HIV-INFECTED CHILDREN

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Background and aims:

Early highly active antiretroviral therapy (HAART) is now universally recommended as soon as infection is established in infants born to HIV-infected mothers. However, the long term outcome of early treated children is still largely unknown. We report our 17 years experience with early HAART.

Methods:

Since 1996 all infants born to an HIV-infected mother followed since birth in our center were treated by 3 reverse transcriptase inhibitors (RTI) as soon as HIV infection was diagnosed.

Results:

Between 1996 and 2010, HAART was initiated in 18 children <2 months of age. Two were later lost to follow up (FU).

The viral load (VL) became undetectable with the initial therapy in 12/17 infants followed >1 year. Non adherence was obvious in 3/5 failures.

Seroreversion was demonstrated in 6 children after clearance of passively acquired maternal HIV-1 antibodies. Three subsequently seroconverted during a treatment interruption. Three remain seronegative at 6.5, 12 and 17 years.

Six patients experienced a prolonged treatment interruption. Five had to resume HAART after a mean of 4.9 years without therapy and 1 remains untreated with CD4 cells >35% after >8 years of treatment interruption.

At last FU, all are asymptomatic and doing well. Among 15 patients on triple therapy, 13 have an undetectable VL and 2 are obviously non compliant. None has evidence of resistance mutation outside the RTI class. Only 2 patients have CD4 cells <25% and none <15%.

Conclusions:

Early HAART durably modifies the long-term outcome of HIV-infected children without compromising future treatment options.

ESPID-0680

RESPIRATORY VIRAL INFECTIONS IN CHILDREN AND ADOLESCENTS WITH CANCER, FEVER AND FEBRILE NEUTROPENIA

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Respiratory viral infections (RVIs) are not well understood in cancer patients with fever and neutropenia. Objective: to determine the prevalence of respiratory viruses in children under eighteen with cancer and RVIs; evaluate episodes of febrile neutropenia and clinical characteristics. Method: prospective observational study patients with cancer and RVIs admitted into two hospitals, Brazil, from January 2011 to December 2012. Were analyzed for nasopharyngeal aspirate secretions by rapid test (Biotrin®) for Influenza A, B and H1N1 and by Polymerase chain reaction (qPCR) (Fast Trade®) for 21virus. Results: 136 samples were analyzed. The median age was 10 ± 2 y; male (52.2%). The respiratory viruses have been detected in 46.8%; RVIs repetition (30.1%) and previous use of antibiotic (49.7%). The most frequent cancers were acute lymphocytic leukemia (39.7%) and osteossarcoma (14%). Physical examination: absence of cyanosis (98.5%); fever (76.1%); cough (15.4%), nasal obstruction (4%) and indrawing (1.5%). The anemia was 30.2% and neutropenia (<500) in 41.5%. The rapid test detected six cases (4 IFA and 2IFB). There was a case of H1N1 positive by qPCR but negative by rapid testing. The Rinovirus (19.4%) was the most prevalent, followed by RSV AB (8.9%); Metapneumovirus (4%); Coronavirus 229 (4.8%) and 43 (3.2%). In patients with neutropenia were observed the Rinovirus (20.4%), RSV (12.2%), Coronavirus 229 (6.1%) and 43 (4.1) Coronavirus, p>0.05. The number of cases of co-infection was 19%. The Rinovirus and Coronavirus 43 was most frequent virus. Conclusions: The RVIs were mild cases. The Rinovirus was the most prevalent, even in neutropenicos. Accuracy for the rapid test was low.

ESPID-0681

IMMUNOGENICITY AND SAFETY OF 2-DOSE CATCH-UP VACCINATION WITH THE 10-VALENT PNEUMOCOCCAL NON-TYPEABLE HAEMOPHILUS INFLUENZAE PROTEIN D CONJUGATE VACCINE (PHID-CV) IN THE 6TH YEAR OF LIFE

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Background and aims: 2-dose catch-up vaccination with PHiD-CV (GlaxoSmithKline Vaccines) was shown to be immunogenic and well-tolerated in children up to their 5th birthday. This study assessed 2-dose catch-up vaccination in children in their 6th year of life.

Methods: 100 children aged 64-68 months, previously not vaccinated with any pneumococcal vaccine, were enrolled in a phase III, open-label study in Poland (NCT00624819). These children received 2 doses of PHiD-CV 2 months apart. Sera for immunogenicity assessment (22F-inhibition ELISA and opsonophagocytic activity [OPA] assays for pneumococcal conjugates; ELISA for protein D) were collected pre-vaccination and 1 month post-dose 2. Solicited and unsolicited adverse events (AEs) were reported for 4 and 31 days after each dose, respectively; serious AEs (SAEs) until study end.

Results: The according-to-protocol immunogenicity cohort comprised 98 children. Post-dose 2, for each PHiD-CV serotype, high percentages of children reached the 22F-inhibition ELISA threshold and OPA cut-off (Table). Geometric mean antibody concentrations (GMCs) and OPA titers for vaccine serotypes increased 6-183-fold and 7-426-fold, respectively, from pre- to post-vaccination. The anti-protein D antibody GMC increased from 106.0 to 708.6 EL.U/ml. Pain was the most commonly reported solicited injection site AE (after 40.0% of doses). ≤6.5% of doses were followed by solicited general AEs; ≤1.5% by grade 3 solicited AEs; 3.0% by unsolicited AEs. No SAEs were reported.

Table: Serotype-specific pneumococcal antibody responses (with 95% confidence intervals) 1 month after 2-dose catch-up vaccination (according-to-protocol immunogenicity cohort)

Serotype	22F-inhibition ELISA N=98		OPA N=95	
	% ≥0.2 µg/ml	GMC, µg/ml	% ≥8	GMT
Vaccine serotypes				
1	**100** (96.3; 100)	**2.39** (2.06; 2.78)	**91.6** (84.1; 96.3)	**128** (97; 169)
4	**100** (96.3; 100)	**7.32** (6.70; 8.00)	**100** (96.2; 100)	**4451** (3962; 5001)
5	**100** (96.3; 100)	**3.10** (2.70; 3.55)	**96.7** (90.8; 99.3)	**93** (74; 118)
6B	**94.9** (88.5; 98.3)	**1.25** (1.01; 1.54)	**98.9** (94.3; 100)	**2537** (2014; 3196)
7F	**100** (96.3; 100)	**4.55** (3.93; 5.26)	**100** (96.1; 100)	**9692** (8299; 11318)
9V	**100** (96.3; 100)	**2.20** (1.85; 2.62)	**100** (96.2; 100)	**6456** (5458; 7637)
14	**100** (96.3; 100)	**7.81** (6.34; 9.63)	**100** (96.2; 100)	**4891** (4179; 5725)
18C	**100** (96.3; 100)	**13.21** (11.44; 15.25)	**100** (96.1; 100)	**2256** (1877; 2711)
19F	**100** (96.3; 100)	**15.47** (13.08; 18.29)	**100** (96.1; 100)	**1438** (1147; 1802)
23F	**100** (96.3; 100)	**1.63** (1.32; 2.01)	**100** (96.2; 100)	**5586** (4666; 6688)
Cross-reactive serotypes				
6A	**92.9** (85.8; 97.1)	**0.92** (0.73; 1.16)	**95.6** (89.1; 98.8)	**943** (691; 1287)
19A	**100** (96.3; 100)	**2.39** (1.90; 3.01)	**95.6** (89.1; 98.8)	**376** (256; 553)

OPA, opsonophagocytic activity; N, maximum number of children with available results; % ≥0.2 µg/ml, percentage of children with antibody concentration ≥0.2 µg/ml; % ≥8, percentage of children with OPA titer ≥8; GMC, geometric mean antibody concentration; GMT, geometric mean OPA titer.

Conclusions: 2-dose PHiD-CV catch-up vaccination in children in their 6th year of life elicited robust immune responses and was well-tolerated.

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ESPID-0682

A MULTI-CENTRE RETROSPECTIVE AUDIT OF THE MANAGEMENT OF CHILDHOOD ENCEPHALITIS

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Background and Aims: Although rare, encephalitis remains a devastating condition with a high rate of mortality and morbidity. Early diagnosis and institution of intravenous (IV) acyclovir treatment are key to improving outcomes. This study investigated the management of children with encephalitis.

Methods: Children aged 0 to 18 years with confirmed or presumed encephalitis and admitted to four paediatric units in the UK between 2008 and 2012, were identified through clinical coding. A retrospective review of case notes, investigations and treatment was then performed.

Results: 34 cases were identified. Radiological scans were performed in 55.8%, of which 14-27% were delayed (>48hours from admission). The median time to lumbar puncture (LP) was 12 hours (IQR 4-48). In 20.6% of children, LP was delayed (>48 hours from admission). IV Acyclovir treatment was commenced after 48 hours in 5% of cases. An inadequate acyclovir dose was used in 38.2%. 23.5% were treated with a macrolide. The commonly identified infective causes were enterovirus (29.4%) and HSV (17.6%). Immune mediated encephalitis was seen in 14.7%. No cause was found in 29.4%. 66.6% of cases with HSV encephalitis were reported to have behavioural, cognitive or developmental problems at follow up.

Conclusion: This audit highlights the inadequacy of the diagnostic work up for children with suspected encephalitis and the high rate of suboptimal acyclovir dosing. Recommended action is for paediatric doctors to rationalise their practice in accordance with a recently published UK guideline, as this will impact on care provision and outcomes.

ESPID-0683

DIFFUSION-WEIGHTED MRI OF ABDOMINAL AND SOFT TISSUE ABSCESS IN CHILDREN AND ADOLESCENTS

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Introduction: Diffusion-weighted MRI (DWI) detects cerebral abscess based on restricted diffusivity without the need of i.v. contrast application.

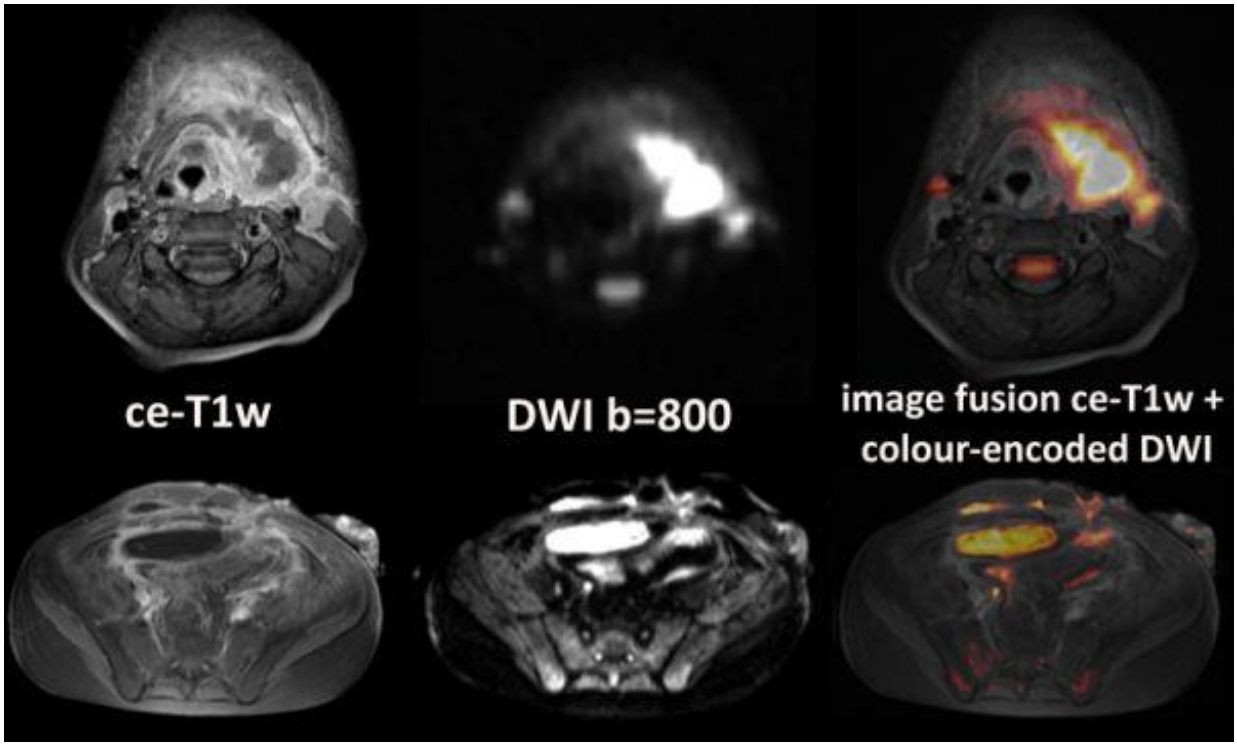
Objectives/Aims: Aim of our retrospective study was to evaluate detectability and imaging characteristics of extracranial abscess on DWI, compared to standard contrast-enhanced T1w (ce-T1w) sequences, in paediatric patients.

Methods: Twenty-four consecutive patients (15 females, age 9±6 years, range 1...17 years) with surgically confirmed abdominal and soft-tissue abscess underwent routine MRI including DWI (single-shot echo planar imaging, FOV 230-360 mm, TR 4600-9000 ms, TE 126-137 ms, b-values 0-50/800-1000 s/mm^2) and ce-T1w imaging. A group of 24 randomly chosen age-matched patients with non-purulent abdominal free fluid served as control. We measured mean apparent diffusion coefficient (ADC, unit $\times 10^{-3}$ mm^2/s) and lesion contrast-to-noise ratio of abscess and abdominal free fluid.

Results: All abscess formations showed high signal on DWI at high b-values indicating restricted diffusion and peripheral ring enhancement after i.v. contrast application. Image contrast was higher on DWI, compared to ce-T1w ($p<0.05$). ADC values < 1.0 with a mean value of 0.75±0.32 were measured in 23 of 24 abscess formations. One tuberculous soft-tissue abscess had a higher ADC of 1.85. There was no overlap with ADC of free abdominal fluid in the control group (3.3±0.34, $p<0.001$).

Conclusions: DWI is a reliable tool for detecting and characterizing extracranial abscess, based on ADC as a quantitative measure.

Figure: Cervical staphylococcus aureus abscess in a 6-year-old boy (upper row). Intraabdominal and abdominal wall abscess in a 16-year-old girl with Crohn's disease (lower row).


ce-T1w
DWI b=800
image fusion ce-T1w +
colour-encoded DWI

ESPID-0684

A EUROPEAN HOSPITAL SURVEY ON DURATION OF ANTIBIOTIC THERAPY FOR COMMON PAEDIATRIC INFECTIONS: WHAT IS CURRENTLY RECOMMENDED?

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BACKGROUND AND AIMS Prolonged antibiotic treatment, when this is not clearly indicated, is common practice in paediatric patients**.**Our aim was to investigate the existence and variability of treatment duration in prescribing guidelines for common infections amongst European paediatric hospitals.
METHODS This survey was in the context of Antibiotic Resistance and Prescribing in European Children study (ARPEC). An electronic questionnaire was disseminated twice (September 2011 and November 2012) to ARPEC participants. We requested data on suggested treatment duration for commonly encountered infections: respiratory (RTI), skin and soft tissue (SSTI), bone and joint (OA), urinary tract and sepsis.
RESULTS 82 paediatric hospitals from 19 European countries participated in the survey. 74/82 (90%) confirmed the existence of antibiotic guidelines for at least one infection group. 12/74 (16%) hospitals provided no data on treatment duration. Duration of therapy was most widely available for RTIs (80%) and less commonly available for SSTIs and OA infections (34% and 25% respectively). Median duration of therapy for AOM was 7 (5-10) days, for pneumonia 8 (7-10) days, UTI 10 (7-10) days, arthritis and osteomyelitis 21 (14-28) and 28 (21-28) days respectively. In terms of sepsis the median duration of therapy for culture negative sepsis in neonates was 7 (3-10) days, while for older infants and children 10 (10-14) days.
CONCLUSIONS We documented lack of treatment duration guidance in European hospitals and great variation especially in treatment of neonatal sepsis. Stronger evidence in treatment duration for common paediatric infections is needed, a key component in any antibiotic stewardship program.

ESPID-0685

PATIENT AND PARENT EXPERIENCES OF A PAEDIATRIC OUTPATIENT PARENTERAL ANTIBIOTIC THERAPY (P-OPAT) SERVICE IN A REGIONAL CHILDREN'S HOSPITAL

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Background

There is compelling evidence to support the management of children receiving intravenous antibiotics at home. Benefits include a reduction of healthcare-associated-infections, cost-savings, parent/patient satisfaction, psychological wellbeing and earlier return to school/employment. However, data regarding the experiences of patients and families being managed by OPAT services are lacking.

Methods

During an 18-month period (July-2012 to December-2013), 67 patients were treated by a regional children's hospital p-OPAT team. After completing treatment, 55 feedback questionnaires were sent out, of which 47 (85%) were returned. 8 patients were not given questionnaires; 2 patients had completed a questionnaire from a previous p-OPAT episode and for 6 patients it was not deemed appropriate due to readmission for other reasons. Children and parents were asked to jointly complete the questionnaire

Results

All 47 (100%) families agreed or strongly agreed that p-OPAT was preferable to inpatient treatment and would accept this form of treatment again. A recurring theme was the parental perception that management at home had expedited their child's recovery following serious illness. Parents also commented on the importance of clear communication between the hospital, community teams and the families.

Conclusions

This audit clearly demonstrates that p-OPAT is acceptable and for the majority of families, is the preferable option compared with extended inpatient stays. Managing children on home intravenous antibiotics should be considered whenever possible within a structured governance framework.

ESPID-0686

CLINICAL COURSE OF EOSINOPHILIC COLITIS IN CHILDREN

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Introduction: Eosinophilic colitis (EC), which is a rare form of eosinophilic gastrointestinal disorder, occurs as a primary allergic EC or is secondary to other gastrointestinal tract diseases. Diagnosis is based on a significant amount of eosinophils in inflammatory infiltration of the colon mucosa.

Aim of the study: The aim of the study was the analysis of the clinical picture of *eosinophilic colitis in children*, including comorbidities and endoscopic picture.

Methods: The study group constituted 43 children, average age – 12,1 years, with diagnosed EC (according to the Whitington Scale). In the study group, tests for food allergies, celiac disease, inflammatory bowel disease, gastrointestinal infections and parasitic diseases were performed. Furthermore, it was performed the analysis of the relationship between intensity of eosinophilic infiltration of the colon mucosa and the severity of clinical symptoms, endoscopic picture, and presence of inflammatory bowel disease and food allergy.

Results: Among the patients, half was the children with isolated EC. In other cases eosinophilic infiltrations were accompanied by inflammatory bowel disease, and more often by Crohn's disease. Endoscopic picture was nonspecific, and in histopathological examination III grade in Whitington Scale dominated, predominantly was located in the entire colon. Elevated levels of total IgE were only found in less than half of the patients and it did not correlate with the severity of eosinophilic infiltration. The correlation of the severity of eosinophilic infiltration with exacerbation of clinical symptoms, endoscopic picture and the presence of inflammatory bowel was shown. In about 20% of children with isolated EC and in 63% of patients with CD elevated levels of ASCA and ANCA antibodies were found.

Conclusions: Elevated levels of total IgE in less than half of the patients with EC indicate the necessity to expand the diagnosis of allergy also in the direction of IgE-independent allergies. The presence of elevated levels of ASCA and ANCA antibodies in some patients with isolated EC indicates the need for further observation for the occurrence of inflammatory bowel disease.

ESPID-0687

CLINICAL UTILITY AND THE RELATIONSHIP BETWEEN EBV DNA LOADS IN WHOLE BLOOD AND PLASMA IN A PAEDIATRIC RENAL TRANSPLANT COHORT.

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Monitoring of Epstein-Barr virus DNA viral loads (EBVLs) in whole blood and plasma collected from transplant patients has been used in the diagnosis and management of EBV infection and those patients at risk of EBV associated PTLD. Recent studies have confirmed that a cohort of transplant recipients persist with chronically high EBVLs, calling into question the utility of monitoring EBVLs. The aims of this study were (i) to compare EBVLs in paired whole blood and plasma samples collected from 64 pediatric patients post-renal transplants and (ii) to assess the utility of monitoring EBVLs. Sixty six percent of patients were EBV seronegative at transplant. Kinetic analysis over a long period of time showed a relationship between the plasma and whole blood EBVLs. However individual time-point values often did not correlate. A significant negative correlation was observed between EBVLs and time since transplant ($r=-0.95$, $p<0.002$). Furthermore, those patients acquiring primary infection post-transplant tended to progress to persistent high viral load carriers. To date, there is no published evidence that any biomarker measured during times of clinical quiescence can accurately predict long-term transplant outcome and risk of PTLD. Our findings show that a strong correlation of EBVLs in plasma and whole blood without necessarily high VLs maybe an indicator of primary EBV infection in the recent past.

ESPID-0688

IMPACT OF ROTAVIRUS VACCINATION IN A BELGIAN PAEDIATRIC HOSPITAL WARD: A CASE STUDY

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BACKGROUND AND AIMS: Rotavirus infection leads to epidemic conditions of acute gastro-enteritis in infants during each winter period. Rotavirus vaccination has been reimbursed since November 2006 in Belgium with an initial uptake >85%. It has led to a dramatic reduction in rotavirus-related hospitalisations in children ≤5y old. How does that reduction affect hospital management of infectious diseases in a paediatric ward during subsequent winter periods?

METHODS: We analysed retrospectively the data-base of one hospital in Belgium (n=34 paediatric beds) to determine the number of infectious diseases-related hospitalisations in function of bed occupancy rates and causes (APR-DRG code), over a 6-year period (2004-2009) and during the epidemic period (January- March).

RESULTS: We observed an overall reduction in bed occupancy rate from pre- to post-vaccine introduction (3020 bed-days in 2005 - 2430 bed-days in 2009, -20%) and a relative shift to disease areas that were less present before the vaccine introduction (viral diseases: +10%; renal infection: +10%; Epiglottis, Otitis, Laryngo Tracheitis: +7%). With the decrease in diarrhoea events we observed a similar reduction in respiratory events, partially explained by the concomitant introduction of pneumococcal vaccination (January 2007). The bed occupancy rate for both pathologies shifted from 82% (2004) to <50% (2009).

CONCLUSIONS: A dramatic change in infection pathology is observed at the level of a paediatric ward in hospital care since the introduction of the rotavirus and pneumococcal vaccines. It reduced the overall bed occupancy rates in absolute numbers during winter, but shifted the focus to new infection priorities for children.

ESPID-0689

ADEQUACY OF BLOOD CULTURE SAMPLING IN A TERTIARY CHILDREN'S HOSPITAL

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Background:
Blood cultures are the gold standard for detecting bacteraemia in children with suspected sepsis. Several factors influence the yield from blood cultures with the volume of blood sampled being among the most important.

Aim:
To determine (i) the volume of blood submitted for culture; (ii) the proportion of blood cultures with sufficient volume and (iii) the impact of blood volume on yield in children attending a tertiary children's hospital.

Methods:
The volume of blood submitted in blood cultures was determined over a seven-month period by weighing bottles before and after collection. Clinical staff were blinded to the study. Blood cultures were deemed adequate if they contained an appropriate age-related volume and were submitted in the correct bottle.

Results:
The volumes of blood submitted in 2893 culture bottles were measured. Of 2893 blood cultures 56% contained a sufficient blood volume and 81% were sent in an appropriate bottle. Fewer than 50% of cultures were deemed adequate. Samples from neonates were less likely to contain a sufficient volume of blood compared to older children (p=0.01). Blood cultures were positive in 4.9% of samples: 83/1609 (5.2%) with adequate volume versus 58/1284 (4.5%) with inadequate volume (p=0.4).

Age	Sufficient Volume n(%)	Appropriate Bottle n(%)	Adequate submission n(%)
Less than 1 m	63/167 (38)	165/167 (99)	62/167 (37)
1m to 3y	613/1082(57)	946/1082 (87)	519/1082 (48)
More than 3 y	933/1644 (57)	1243/1644 (76)	856/1644 (52)
Total	1609/2893 (56)	2354/2893 (81)	1437/2893 (49)

Conclusion:
More than half of blood samples submitted for culture were inadequate. This has direct implications for patient care and highlights a need for improved education in this area.

ESPID-0690

EPIDEMIOLOGY AND RISK FACTORS FOR INTESTINAL PARASITE IN INTERNATIONALLY ADOPTED CHILDREN

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Introduction: Little epidemiological data are available about digestive parasitic infections in internationally adopted children.

Objectives: The main objective was to determine the prevalence of digestive parasitic infections in internationally adopted children in Northern France. Secondary objectives were to identify risk factors for digestive parasitic infections.

Methods: A multicenter retrospective cohort study was performed over a 3-year period (2009-2011) in Northern France. All consecutively adopted children that have had a specialized outpatient visit for adoption within the first year after arrival were included. Analyses included the calculation of the prevalence of positive Parasitological Examination of Stools (PES), the rate of PES performed, and the identification of risk factors for positive PES using univariate and multivariable analyses.

Results: Among the 217 children included, 89% had a PES but only 26% have had three PES. PES was positive in 46% of screened children. Overall, 41% children had an intestinal parasite and 35% a pathogenic intestinal parasite. The most frequent were *Giarda duodenalis* (67%) and *Hymenolepis nana* (21%). After the multivariable analysis, factors associated to a positive PES were an age at arrival >12 months (adjusted odds ratio [aOR]: 4.0, 95% confidence interval [CI]: 1.5-10.3). Factors associated with the presence of a pathogenic parasite were the presence of diarrhoea (aOR: 2.3, 95%CI: 1.2-4.7) and of hepatitis A antibodies (aOR: 2.1, 95%CI: 1.0-4.1).

Conclusion: Digestive parasitic infections are frequent in internationally adopted children but not researched systematically and adequately. The knowledge of risk factors could contribute to a better identification and management of these children.

ESPID-0691

THE NEONATAL BCG VACCINATION PROGRAMME - THE CASE FOR ADOPTING A MORE TARGETTED APPROACH

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Introduction: In addition to International Union Against Tuberculosis and Lung Diseases criteria, economic evaluation is a useful tool for countries considering whether to modify or stop a universal BCG vaccination programme.
Objective: To compare the cost effectiveness of the current universal BCG vaccination programme of infants in Ireland versus a programme which considered selectively vaccinating high risk infants via decision analytical modelling.
Methods: The efficacy of the BCG vaccine was re-evaluated and a model was constructed to follow a birth cohort of vaccinated and unvaccinated infants over a 15 year time horizon. The number of life years gained (LYG) was the primary outcome measure. This was compared to the net cost of the vaccination strategies.
Results: In the base case analysis, the incremental cost effectiveness ratios (ICERs) for the universal strategy and selective strategy vs no vaccination were €40,234/LYG and €19,443/LYG respectively. If moving from a universal to a selective strategy the programme would save approximately €560,784 per birth cohort, but there would be less health gain (1.05 life years lost).
Conclusions: The results of the study have (i) confirmed the protective effect of the BCG vaccine in infants (ii) quantified the cost effectiveness of the current BCG vaccination strategy and the decremental difference in moving to a selective strategy. Given current fiscal constraints, the additional resources required by the universal programme for the small incremental benefit may seem unjustified and a more pragmatic solution may be to divert resources saved to other areas of TB case management and control.

ESPID-0692

TUBERCULOSIS INFECTION IN CHILDREN WITH HOUSEHOLD CONTACT OF ADULTS WITH ACTIVE PULMONARY TUBERCULOSIS AS ASSESSED BY TST AND IGRA

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Background and Aims: Detection of latent tuberculosis infection aiming treatment of high-risk individuals is important for tuberculosis (TB) control.

Methods: Tuberculin skin test (TST) and interferon-gamma release assays (QFT-IT and T-SPOT.TB) were performed in immunocompetent children and adolescents <15 years: one group exposed to adults with active pulmonary TB and another group without known exposure. All individuals were analyzed clinically, with chest radiography, TST, QFT-IT and T-SPOT.TB. If results of the 3 tests were initially negative, they were repeated after 8 weeks in the TB-exposed group.

Results: 101 children and adolescents, 59 TB-exposed and 42 TB-unexposed, were evaluated. All but one received BCG in the first months of life. Considering the 3 tests, the rate of infection was 69.5% for TB-exposed and 9.5% for TB-unexposed group. None of TB-infected children and adolescents had active TB disease. Infection rate evaluated with each test separately among TB-exposed individuals is shown in Table.

Evaluation	TST	T-SPOT.TB	QFT-IT
First	57.6%	55.9%	57.6%
Second	3.4%	1.7%	1.7%
Total	61.0%	57.6%	59.3%

Agreement between tests was 83.1% for exposed and 88.1% for unexposed group. T-SPOT.TB added 4/25 individuals with negative TST (16%; 95%CI, 1.6-30.4) and QFT-IT added 3/25 individuals with negative TST (12%; 95%CI, 0-24.7) in the exposed group. Risk factors associated to TB infection were exposure to active pulmonary tuberculosis (OR: 10.77; 95%CI: 3.11-37.29) and sleeping in the same room (OR: 7.06; 95%CI: 1.76-28.24).

Conclusion: TST and IGRAs had a similar performance in immunocompetent BCG-vaccinated children and adolescents, with a high rate of LTBI.

ESPID-0693

INFLUENZA B IMPACT IN PEDIATRIC AGE GROUPS: ANALYSIS OF 5,883 CONFIRMED INFLUENZA CASES IN SARS INPATIENTS, BRAZIL - 2013.

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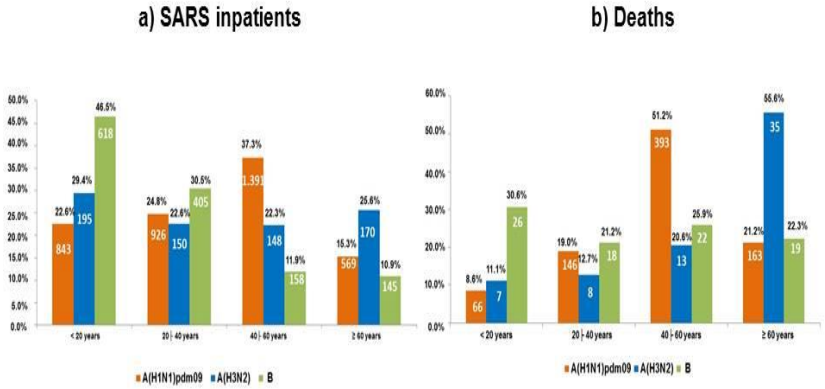
Background and objectives: Little information is available on influenza B impact in Brazil. The aim of this study was to review laboratory data in confirmed influenza SARS hospitalization cases recorded in 2013.

Methods: This is a descriptive study of SARS inpatients, performed from 01/01 to 12/10/2013 in Brazil. Data were obtained from the SINAN databank, and reviewed by age group, identified influenza strain and previous vaccination.

Results: In 2013, influenza was identified in 16.5% (5,883/35.558) of SARS hospitalization cases. The most frequent strains included: A(H1N1)pdm09 (63.4%), B (22.6%) and A(H3N2) (11.3%). The rate of confirmed B strain in the pediatric age groups (0-19y) was higher in both SARS hospitalization cases and deaths (Fig 1a and b). Influenza A(H1N1)pdm09 caused higher CFR in all age groups, except in children < 6 mo of age, and fatality rate increased with age until 40 years (Fig 2).

Conclusions: Influenza caused high morbidity and a significant number of deaths in patients of all age groups. In 2013, influenza B had a higher impact in pediatric age groups, as compared with other age groups. These results emphasize the relevance of prevention through immunization.

Fig 1. Distribution of SARS inpatients (a) and deaths (b) with influenza caused by strain A(H1N1)pdm09, A(H3N2) and B, by age group, Brazil 2013.

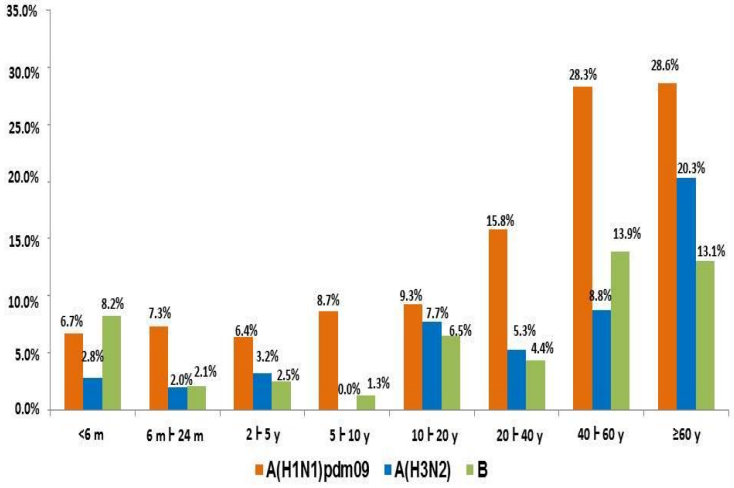


Total cases per strain:
A(H1N1)pdm09 – 3,729
A(H3N2) – 663
Influenza B – 1,326

Total of deaths per strain:
A(H1N1)pdm09 – 768
A(H3N2) – 63
Influenza B – 85

Source: Sinanweb Databank 12/01/2013 to 12/10/2013. Interim data.
Note: included only patients with recorded date of birth.

Fig 2. Influenza CFR in SARS inpatients confirmed by strain and age group, Brazil 2013.



Source: Sinanweb Databank 12/01/2013 to 12/10/2013. Interim data.
Note: included only patients with recorded date of birth.

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ESPID-0694

DISCREPANT PROCALCITONIN AND C-REACTIVE PROTEIN LEVELS IN CHILDREN

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Background and aims: Procalcitonin (PCT) and C-reactive protein (CRP) are used as biomarkers for bacterial infections. We describe here potential benefits and disadvantages of these markers by comparing clinical manifestations in patients with discrepant PCT and CRP results.

Methods: We identified from the laboratory data files PCT and CRP determinations done simultaneously for children treated at the Turku University Hospital during 2010. PCT values >0.5µg/l and CRP values >40 mg/l were considered elevated. Diagnoses, microbiological findings, and clinical characteristics were retrieved from the electronic patient files. We compared the groups where only PCT or CRP was elevated.

Results: 1240 pairs of PCT and CRP measurements were documented. There were 72 cases with elevated PCT but low CRP, and 85 cases with elevated CRP but low PCT. In the group with high PCT and low CRP, children were younger (mean age, 3.4 vs. 8.0 years, $p < 0.001$), the duration of symptoms was shorter (1.1 vs. 3.0 days, $p < 0.001$), and there were more neonatal infections (13 vs. 0, $p < 0.001$), more children with hypoxia or hemodynamic stress without confirmed infection (14 vs. 0, $p < 0.001$), and more cases of blood culture positive sepsis (9 vs. 0, $p=0.001$) than in the group with low PCT and high CRP. The latter group was associated with postoperative setting ($p=0.004$) and isolated, bacterial-type infections ($p=0.005$).

Conclusions: In certain clinical settings, either PCT or CRP may be increased non-specifically in the absence of a bacterial infection, and use of both markers might provide an advantage.

ESPID-0695

FACIAL NERVE PARESIS AS A COMPLICATION OF ACUTE OTITIS MEDIA

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Introduction: Facial nerve paresis (FNP) is a disorder of all ages that usually develops within 2 weeks after a systemic infection. FNP is an uncommon complication of acute inflammation of the middle ear, with an estimated incidence of 0.005%. Full recovery occurs in about 80% of the cases, but 20% experience some kind of permanent nerve damage. In this case, a 3-year-old boy with otitis media developed facial nerve paresis despite antibiotic therapy and excellent clinical condition.

Results: A 3-year-old boy was admitted with the diagnosis of right otitis media and high fever up to 39,5°C. The patient was already under treatment with azithromycin orally for 3 days by his pediatrician, without clinical improvement. In our hospital medical treatment consisted of intravenous cefuroxime. He got feverless the 3rd day of the intravenous treatment, while the earache had been getting improved. On the 6th day of hospitalization the patient presented unilateral facial paresis. The antibiotic treatment was changed to ceftriaxone and after otolaryngologist's recommendation, intravenous cortisone was added to treatment. The patient was transported to a central children's hospital where he underwent myringotomy by a children's specialist with excellent recovery.

Conclusions: Otitis media is a benign disease, which is often considered to be self-limited; however, the general pediatrician must always be aware of its complications, such as FNP, in which the treatment of choice is urgent myringotomy with excellent recovery.

ESPID-0696

ANTIBODY PERSISTENCE AND IMMUNOLOGIC MEMORY 4 YEARS AFTER COMPLETION OF 3+1 INFANT VACCINATION WITH 7- OR 10-VALENT PNEUMOCOCCAL CONJUGATE VACCINE

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Background and aims: The duration of protection after infant vaccination with pneumococcal conjugate vaccines (PCVs) is unclear. We assessed long-term antibody persistence and immunologic memory after vaccination with GlaxoSmithKline's 10-valent PCV, PHiD-CV, or Wyeth/Pfizer's 7-valent PCV, 7vCRM.

Methods: This phase III, open-label, follow-up study in Poland (NCT00624819) evaluated antibody persistence 1(Y1), 2(Y2) and 4(Y4) years after completion of primary/booster vaccination (at 2,3,4/12-18 months of age [M] in randomized trials NCT00307554/NCT00370396) with PHiD-CV (PHiD-CV/PHiD-CV), 7vCRM (7vCRM/7vCRM) or 7vCRM and PHiD-CV (7vCRM/PHiD-CV). These vaccinated children received an additional PHiD-CV dose at 64-68M (Y4). Anamnestic responses assessed 7-10 days (D) post-additional dose were compared with responses 7-10D after a 1st dose in age-matched, previously unvaccinated controls.

Results: For most vaccine serotypes, 22F-ELISA and OPA responses in vaccinated children declined until Y2, remained stable or slightly increased by Y4 (pre-additional dose), and were in similar ranges in the 3 groups at Y4; ≥90.5% children had antibody concentrations ≥0.05 µg/ml (except for serotypes 1, 7F [7vCRM/7vCRM]); ≥42.9% had OPA titers ≥8 (except for 1, 5 [all groups]).

Geometric mean antibody concentrations and OPA titers increased from pre- to 7-10D post-vaccination and, for most PHiD-CV serotypes, were higher in previously

vaccinated than unvaccinated children (Table).

Table: Serotype-specific pneumococcal antibody responses (with 95% confidence intervals) 7-10 days post-additional PHiD-CV dose in vaccinated children or 7-10 days post-1st dose in unvaccinated children (ATP cohort for immunogenicity)

Sero-type	PHiD-CV/PHiD-CV N=208	7vCRM/7vCRM N=14	7vCRM/PHiD-CV N=54	Unvaccinated N=98
Antibody GMC (22F-inhibition ELISA)				
1	**5.36** (4.54; 6.33)	**3.04** (1.22; 7.56)	**5.00** (3.72; 6.71)	**1.35** (1.08; 1.69)
4	**12.11** (10.08; 14.54)	**10.45** (6.49; 16.81)	**7.13** (5.18; 9.82)	**4.74** (3.77; 5.95)
5	**6.23** (5.19; 7.49)	**3.24** (1.44; 7.29)	**8.15** (5.71; 11.63)	**1.20** (0.97; 1.49)
6B	**3.68** (3.16; 4.29)	**2.85** (1.89; 4.30)	**2.15** (1.62; 2.85)	**0.53** (0.40; 0.71)
7F	**7.16** (6.11; 8.39)	**3.26** (1.67; 6.35)	**7.57** (5.84; 9.81)	**1.67** (1.33; 2.09)
9V	**9.94** (8.59; 11.51)	**9.00** (5.49; 14.77)	**5.32** (4.08; 6.94)	**0.90** (0.66; 1.23)
14	**19.38** (16.74; 22.43)	**13.26** (6.91; 25.43)	**18.61** (14.23; 24.34)	**1.72** (1.20; 2.46)
18C	**15.51** (13.06; 18.43)	**19.71** (11.87; 32.74)	**13.34** (9.34; 19.05)	**2.26** (1.66; 3.09)
19F	**11.63** (10.00; 13.51)	**16.44** (10.68; 25.29)	**8.09** (6.29; 10.42)	**5.12** (3.97; 6.62)
23F	**6.50** (5.61; 7.53)	**9.34** (5.62; 15.54)	**4.70** (3.43; 6.45)	**0.42** (0.30; 0.59)
6A*	**2.20** (1.85; 2.60)	**1.67** (1.00; 2.80)	**1.33** (0.96; 1.83)	**0.44** (0.33; 0.58)
19A*	**2.79** (2.33; 3.35)	**2.44** (1.20; 4.96)	**1.72** (1.14; 2.61)	**1.10** (0.84; 1.45)
OPA GMT				
1	**2921** (2354; 3625)	**1331** (587; 3020)	**1816** (1090; 3026)	**605** (463; 791)
4	**23634** (19119; 29215)	**10650** (3969; 28578)	**8593** (5609; 13163)	**18262** (15572; 21417)
5	**822** (663; 1020)	**376** (217; 649)	**684** (429; 1090)	**296** (219; 398)
6B	**3513** (2858; 4318)	**3567** (2446; 5200)	**1591** (943; 2683)	**1971** (1238; 3139)
7F	**25196** (21150; 30018)	**17829** (10270; 30950)	**13099** (9716; 17660)	**19243** (15701; 23585)
9V	**9419** (7586; 11696)	**12235** (8281; 18077)	**7730** (5362; 11145)	**8323** (6606; 10486)
14	**8572** (7145; 10284)	**4193** (2219; 7924)	**6883** (5057; 9368)	**4678** (3788; 5778)
18C	**3379** (2652; 4305)	**3479** (1789; 6766)	**1663** (971; 2850)	**2503** (1693; 3702)
19F	**1346** (1069; 1697)	**2340** (655; 8365)	**662** (430; 1020)	**700** (456; 1075)
23F	**8700** (7022; 10781)	**11341** (5375; 23931)	**7872** (4965; 12480)	**6814** (5250; 8845)
6A*	**1218** (958; 1548)	**1490** (682; 3258)	**468** (294; 745)	**827** (594; 1150)
19A*	**467** (335; 651)	**438** (81; 2356)	**106** (54; 208)	**431** (269; 690)

*Cross-reactive serotypes; ATP, according-to-protocol; PHiD-CV, 10-valent pneumococcal non-typeable *Haemophilus influenzae* protein D conjugate vaccine; 7vCRM, 7-valent pneumococcal CRM_{197} conjugate vaccine; PHiD-CV/PHiD-CV, previously primed and boosted with PHiD-CV; 7vCRM/7vCRM, previously primed and boosted with 7vCRM; 7vCRM/PHiD-CV, previously primed with 7vCRM and boosted with PHiD-CV; unvaccinated, not previously vaccinated with any pneumococcal vaccine; N, maximum number of children with available results; GMC, geometric mean concentration; OPA, opsonophagocytic activity; GMT, geometric mean titer.

Conclusions: Antibody persistence was observed up to 4 years post-PHiD-CV or 7vCRM booster vaccination. An additional PHiD-CV dose at 64-68M elicited robust anamnestic responses, suggesting induction of immunologic memory after previous priming/boosting irrespective of the PCV used.

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ANTIBIOTIC PRESCRIBING IN AMBULATORY PEDIATRICS IN GREECE, 2010-2013

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Introduction: Antibiotics are commonly prescribed for children with conditions for which they provide no benefit. Up to 50% of prescriptions are unnecessary or inappropriate.

Objectives: Our objective was to provide a nationally representative analysis of antibiotic prescribing in ambulatory care pediatric patients.

Methods: Data on antibiotic prescriptions for patients < 19 years old between July 2010 and June 2013 in Greece were extracted from the IMS Health Xponent database, which represents a 100% projection of prescribing activity in the community based on representative sample. Data collected included physicians' and patients' demographics, physicians' specialty, medications prescribed and diagnoses. Antibiotics were grouped into narrow-spectrum antibiotics (penicillin, amoxicillin, 1st generation cephalosporins, tetracyclines, and sulfonamides) and broad spectrum (all other antibiotics). The number of prescriptions and census denominators were used to calculate prescribing rates.

Results: 7 million prescriptions were dispensed; annual rate of 1,100 prescriptions per 1000 persons (95% CI: 1099 – 1101). Prescribing rates were higher among in children < 10 years old (1,633 prescriptions/1000 persons). Acute respiratory infections (ARIs) accounted for 80% of prescriptions. 25% were for ARIs which antibiotics are not clearly indicated. Cephalosporins (32.9%), penicillins (32.3%) and macrolides (32.1%) were the most commonly prescribed antibiotic classes. Clarithromycin (25%), amoxicillin/clavulanic acid (22.6%) and cefprozil (18.4%) were the most frequently prescribed agents. The majority (88%) of antibiotics were broad-spectrum.

Conclusion: Broad-spectrum antibiotic prescribing is common in outpatient pediatric patients and frequently inappropriate. The overuse of broad-spectrum antibiotics imposes high cost and leads to increased antimicrobial resistance.

ESPID-0698

EFFECT OF EARLY ONSET OF ACUTE OTITIS MEDIA ON THE USE OF HEALTHCARE RESOURCES DURING CHILDHOOD

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Background: Acute otitis media (AOM) before one year of age is associated with recurrent AOM. We further investigated the association between age of initial AOM in the first year of life and AOM related healthcare consumption during childhood.

Methods: In the Wheezing-Illnesses-STudy-LEidsche-Rijn birth cohort study children were followed prospectively from birth through age six years. Children with at least one GP-diagnosed AOM episode before one year of age were included in the analysis. Data on subsequent GP-diagnosed AOM and related consultations, antibiotic prescriptions and specialist referrals were collected from electronic GP records. Negative binomial and cox regression was used to model associations between age of initial AOM during the first year of life and AOM healthcare consumption up to age six years.

Results: 527 out of 2010 children experienced a first AOM episode before one year of age (first-year incidence: 52/1000 child-years; 95% confidence interval [CI]:43-61). With each month decrease in age of initial AOM, the rate of GP-diagnosed AOM during the subsequent 6 years follow-up increased by 5% (adjusted rate ratio (aRR):1.05; 95%CI:1.01-1.09). Similarly, GP consultation rate increased by 6% (aRR:1.06; 95%CI:0.02-1.09), number of antibiotic prescriptions by 6% (aRR:1.06;95%CI:1.02-1.10) and risk for specialist referral by 9% (adjusted hazard ratio:0.92;95%CI:1.02-1.16), per month decrease in age of initial AOM.

Conclusion: Within the first year of life, earlier age of initial AOM is significantly associated with increased AOM healthcare consumption during childhood, suggesting more frequent and more severe disease. Preventing early onset of AOM could decrease AOM healthcare consumption and associated disease.

ESPID-0699

QUANTIFYING THE BURDEN OF HA-BSI IN CHILDREN IN ENGLAND: ESTIMATING EXCESS LENGTH OF HOSPITAL STAY AND MORTALITY

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Introduction Hospital-acquired bloodstream infections (HA-BSI) are associated with substantial morbidity and mortality in all patient populations. Young children have been shown to have a high rate of healthcare-associated infections compared to the adult population. Despite this there are few robust estimates of the health and economic impact of HA-BSI in this population.

Aims To quantify the excess mortality and length of stay (LoS) in paediatric patients due to HA-BSI.

Methods We analysed data collected retrospectively from a probabilistically linked national database of paediatric in-patients with a microbiologically confirmed HA-BSI in England between January-March 2009. A multistate model, adjusting for the time to onset of HA-BSI, was used to compare outcomes of patients with HA-BSI to those without infection. We further adjusted for patients' co-morbidity and other characteristics as recorded in hospital admission data.

Results The dataset comprised 297,973 admissions, with 251 cases of HA-BSI. After adjustment for time to HA-BSI and co-morbidities, the daily probability of discharge (dead or alive) for HA-BSI patients was 0.84 times (95% confidence interval CI: 0.68, 0.94) that of non-infected patients. Excess LoS associated with all-cause HA-BSI was 4.31 days (95% CI: 1.21, 7.41), although this varied by pathogen. HA-BSI patients had a 3.86 (95% CI: 1.45, 10.23) times higher daily chance of in-hospital death, than non-infected patients.

Conclusions HA-BSI increased the length of stay and mortality of paediatric inpatients. The results of this study provide an evidence base to judge the health and economic impact of programs to prevent and control HA-BSI in children.

ESPID-0700

CHILDHOOD OSTEOMYELITIS IN STOCKHOLM, SWEDEN 2005-2013

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Introduction: Osteomyelitis in children is a potentially serious invasive bacterial infection. If not correctly diagnosed and promptly managed, complications may arise and long-term sequele such as growth disturbance and pathological fractures may follow.
Objectives: To study the incidence, epidemiology, microbiology, inflammatory markers and diagnostic imaging procedures in children with osteomyelitis at the major university children's hospital in Stockholm, Sweden.
Methods: All cases of osteomyelitis in children were studied retrospectively by reviewing the medical records of all children hospitalized during 8 years between July 2005 and June 2013. All positive blood cultures in children during the same period were studied and those with osteomyelitis were identified.
Results: The incidence of OM in Stockholm was 11/100 000. 61% of the cases of OM occurred in children less than 4 years and there were no peak later in childhood. 32% of the children had positive cultures either in blood or tissue. The most common culture verified pathogen was *S. aureus*. The best available imaging technique for osteomyelitis, MRI, was used in only 24% of the children. Mean hospital stay was 4.7 days and the mean CRP value was 7.1 mg/dL.
Conclusion: This study confirms the difficulties in diagnosing osteomyelitis in children and underscores the importance of doing studies in your national setting. Symptoms are often subtle in contrast to previous textbook descriptions, where osteomyelitis presents with high fever, severe pain and inability to walk. The need for well-controlled prospective multicentre studies is crucial.

ESPID-0701

EFFICACY AND SAFETY OF WITHHOLDING ANTIMICROBIAL TREATMENT IN CHILDREN WITH CANCER, FEVER AND NEUTROPENIA WITH A DEMONSTRATED VIRAL RESPIRATORY INFECTION

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Background. Current data suggests that respiratory virus (RV) are one of the most frequent microorganism detected in children with cancer and febrile neutropenia (FN).The aim of this study was to determine efficacy and safety of withholding antimicrobial therapy in children with a respiratory viral exclusive FN episode. **Methods**. Prospective, multicenter, randomized study. Children presenting with FN at five hospitals in Santiago, Chile, were evaluated at admission for a protocolized microbiological, imaging and molecular-based evaluation for RV, performed in nasopharyngeal aspirate by a PCR-microarray platform for 17 RV. Children with episodes positive for a RV, with a favorable evolution at 48 hours of hospitalization were randomized into a current antimicrobial management (group A) versus antimicrobial withholding (group B). End point were days of fever/ hospitalization/ antimicrobial use, resolving uneventfully/developing bacterial infection/sepsis, need for intensive care unit (ICU)/death. **Results.** A total of 62 (18%) of 343 FN episodes evaluated (June 2012-December 2013) had a RV as a unique identified microorganism, 23 randomized to group A and 39 to group B. Days of antimicrobial use were 7 *vs* 3, P<0.05, with similar days of fever and hospitalization, similar frequency of resolving uneventfully (95%-92%) and bacterial infection (4%-5%), with one case of sepsis and need for ICU in group A, without cases of death. **Conclusion.** The reduction of antimicrobial use in children with FN and RV infections, based on stringent clinical and microbiological/ molecular diagnostic criteria should favor the adoption of evidence-based management strategies in this population

ESPID-0702

MUMPS NEUTRALIZING ANTIBODY CAPACITY DIFFERS SIGNIFICANTLY BETWEEN MALES AND FEMALES.

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We previously reported a highly significant male bias for acute mumps virus infection which was independent of vaccination status (Carr et al, J Clin Micro. 2010). This study further investigates this potential gender bias. Mumps specific IgG levels were measured in sera using four immunoassays with different mumps strains/antigenic targets: mumps nucleoprotein (NP), Enders strain (ES), Jeryl-Lynn vaccine strain plus Enders strains (AT), and G5 the current outbreak strain (G5). Serological evidence of prior immunological exposure to mumps virus by the detection of mumps IgG following infection or vaccination was high in both genders but the titre was significantly higher in males for the NP ($p< 0.001$); ES ($p<0.02$) and AT ($p<0.002$) but not G5 (pNS) test systems. Female patients identified as acutely infected with mumps by the presence of mumps IgM, had levels of mumps IgG significantly higher than those females with previous exposure in all 4 test systems ($p<0.001$ for all tests), but males showed no difference in levels. Neutralization assays to the G5 mumps strain revealed significant gender differences. Sera from females showed significantly greater neutralizing ability compared to sera from males in both acute and previously exposed cases ($p<0.001$). Sera from males showed no difference in neutralizing ability in acute or previously exposed cases (pNS). Our findings show that although sera from males have higher levels of mumps IgG, the neutralizing capacity is lower than that seen in females. This may in part explain the significant male gender bias observed in recent outbreaks.

ESPID-0703

ANTIRETROVIRAL IMPACT ON NEUROCOGNITIVE PROFILE IN HIV-INFECTED CHILDREN. NEUROCORISPES COHORT

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Aim:The aim of our study is determine neurocognitive profile and possible risk factors.Methodology: HIV infected children 4-21 years due to vertical transmission followed according to a standard protocol (metabolic/antropometric studies, neurocognitive tests and psychosocial profile). Neurocognitive functions evaluated:attention, visuoconstructional ability,executive functions, memory and intellectual skills. Cross-sectional study. Results: 61/ 250 were evaluated. Median age: 15.7 years old (5.1,21.6), age at diagnoses 0.48 years (0,11.2), 63.9% females, 44.3% were born abroad, AIDS 27.9% (11.5% encephalopathy) Median CD4 at baseline: 1100 cell/mm3 (133,1944), CD4/CD8 1.2 (0.3,2.4). Viral load <50 copies/ml (88.5%). Median time on HAART 13.3 years (0, 13.6). Median number of ARV regiments: 4 (0,11). Most frequent combinations at baseline: 2 NRTI+PI (63.3%), 2NRTI+NNRTI (43.3%). Good adherence: 85.4%. Puberty 52,9%. Lipodistrophy 21.6%. Most affected functions: attention and phonemic fluency, showing poor performance (-2 SD) between 31% and 38% of the sample depending on the test. Results in crystallized intelligence were below the average in 47% of patients, but only 19% obtained similar performance in fluid intelligence. Due to big differences between these measures 50% of the IQ Composure wasn't valid ($p<0.05$). Patients with undetectable viral load showed better performance in executive function (semantic fluency, $p=0.022$; cognitive flexibility, $p=0.036$). Patients who were taking NNRTI (mainly Efavirenz) obtained worse results in attention ($p=0.019$, $p=0,050$).

Conclusion: We found several neurocognitive deficits in our patients, affecting principally to attentional and executive abilities. Repeteadly IQ Composure doesn't reflect their intellectual capacity. NNRTI use was related to worse performance in attention tests, as well as viral load control benefits better executive function.

ESPID-0705

CENTRAL VENOUS CATHETER INFECTION DUE TO MORGANELLA MORGANII: A CASE REPORT

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Introduction: Central venous catheters (CVC) are frequently used invasive devices to supply safe venous access with multiple complications. Catheter related blood stream infections (CRBSI) are frequent complications during CVC usage. Normal flora bacteria are the most common causative agents in patients with CVC for CRBSI.

Case Report: A 4-year-old girl, having tufting enteropathy and parenteral nutrition at home was brought with the complaints of 2-days duration of fever, chilling, respiratory distress and palpitation. She had a history of lower femoral fracture secondary to osteoporosis. Body temperature was 38.8°C, she had tachypnea with minimal subcostal retractions and tachycardia. On laboratory examination, leukocytes 2720/mm3, C-reactive protein 127 mg/dL, erythrocyte sedimentation rate 33 mm/hr. After all samples were obtained for culture, she was started empirical ceftriaxone and vancomycin considering sepsis. Because of fever persistence during the first 72 hour, ceftriaxone was stopped and piperacillin-tazobactam was started. The catheter culture revealed *Morganella morganii,* sensitive to piperacillin-tazobactam. Although causative agent was sensitive to treatment, fever persisted. Despite having no positive result in simultaneous peripheral blood culture, it was thought that she may have had CRBSI. Vancomycin was stopped, amikacin was added, and the catheter was changed. As a result, fever resolved in a few days. Control catheter and peripheral cultures revealed no growth. The treatment was given for 14 days.

Conclusions: This case is presented to mention that *Morganella morganii* can be seen as a rare cause of catheter related bacteremia.

ESPID-0707

AN UNUSUAL CAUSE OF FUNGAL PERITONITIS IN A LIVER TRANSPANT PATIENT: PAECILOMYCES VARIOTII

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Introduction: Paecilomyces species are an infrequent cause of disease in transplant patients, with skin and soft tissue infections being the most common presentation. In non-transplant patients, paecilomyces infection has been associated with implantation of medical devices such as peritoneal catheters. We report the unusual case of P. variotii peritonitis in a liver transplant patient.

Case report:

A 16 -year-old boy developed fever, diffuse abdominal pain and distension 3 months after liver transplantation. Two months posttransplant, he developed an episode of acute rejection for which he received immunosuppressive therapy and he had peritoneal catheters because of the bile collection in the abdomen. Broad spectrum antibiotics for persistent fever and peritonitis were started. All peritoneal fluid and blood cultures for bacteria were negative and P.variotii (Figure 1) was isolated from the peritoneal fluid. Phenotypic idetification were confirmed by DNA sequencing of Inter Transgenic Spacer (ITS) genes located in rDNA gene region and antifungal susceptibility testing were performed according to Clinical Laboratory Standarts Institute (CLSI) guidelines. According to susceptibility testing result, intravenous amphotericin B treatment was started. The clinical and laboratory signs of infection persisted despite antifungal treatment. The patient fully recovered after the removal

of peritoneal catheters.

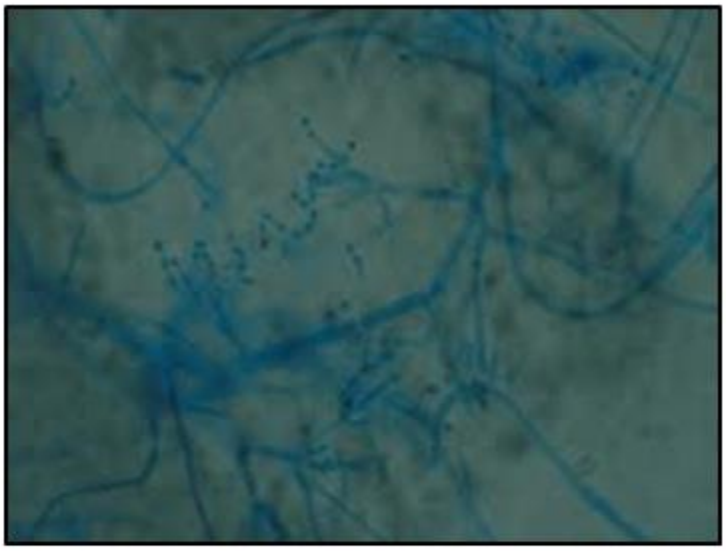

Figure 1. *Paecilomyces variotii* **conidiophores and conidia (x100)**

Conclusion: P.variotii can cause substantial morbidity in transplant patients and sensitive antifungal therapy alone could not be sufficient in the treatment of peritonitis without catheter removal. Continued reporting of invasive infections caused by unusual molds is needed to better define their appropriate management.

ESPID-0708

A PEDIATRIC TETANUS CASE IMMIGRATED FROM SYRIA DUE TO WAR

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Background and aims

Tetanus is a vaccine-preventable, rare disease caused by Clostridium tetani. Although observed whole world around it is more common in developing countries. Immigration from Syria is increased in a few years.

Case report

A 12-year-old boy was admitted with a two day complaint of jaw pain and severe back-ache with rigidity of extremities. He was immigrated with his family from Syria 1 year ago. He defined foot injury occurred 10 days before. He was conscious and had generalized muscular rigidity, trismus and risus sardonicus facies with the rest of examination unremarkable. His laboratory values were in normal range. After foot injury there were no symptoms other than minimally spontaneously resolved swelling so he didn't apply health center. He was diagnosed with generalized tetanus with his clinical manifestations and absent vaccination history. Tetanus vaccination and tetanus immunoglobulin was given. He had severe pain. On admission metranidazole, diazepam, dexmedetomidine and magnesium sulphate was started. In a few days opisthothonus developed and due to the pain he was mechanically ventilated. Fentayl, midazolam, rocuronium bromide was started. Athough the use of muscular relaxants the rigidity didn't resolved. He was accepted as a severe form of generalized tetanus with resistant to muscle relaxants.

Conclusions

Tetanus is still difficult-to-treat disease. Despite the use of multiple muscular relaxants and drugs for pain relief its morbidity remains high. Although tetanus is so rare in Turkey in pediatric population nowadays tetanus cases are observed more because of increased immigrants from Syria who didn't vaccinated.

ESPID-0709

GRANULOMATOUS NONTUBERCULOUS LYMPHADENITIS IN CHILDREN – CLINICAL FEATURES AND VARIOUS TREATMENT OUTCOMES

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Introduction and Aims: Granulomatous nontuberculous lymphadenitis is not uncommon in children. The aim of our study was to describe the clinical features and treatment outcome of granulomatous nontuberculous lymphadenitis in children in Singapore.

Methods: Retrospective study of all children from our centre diagnosed with granulomatous nontuberculous lymphadenitis [based on negative Interferon-Gamma Release Assay, histology showing granulomatous inflammation +/- positive nontuberculous mycobacterial (NTM) cultures] from 2007 to 2012.

Results: There were 79 patients in our study. There were 48 boys (60.8%), and the mean age was 5.6 years (1.2-13.0 years). The mean duration of symptoms was 7.5 weeks. NTM was not isolated in 55/79 cases (69.6%). Of the remaining cases, *M. haemophilum* (12/79, 15.2%), *M. abscessus* (7/79, 8.9%), *M. fortuitum* (2/79, 2.5%) and *M. avium* (1/79, 1.3%) were isolated. Unilateral lymph node involvement, skin discolouration and fever occurred in 94.9%, 57.7% and 14.3% of cases respectively. Nine subjects were excluded in treatment analysis (missing surgical data). Table 1 shows the outcome in the various treatments.

Conclusions: The cure rate in complete excision +/- anti-microbials was higher (33/38, 86.8%) compared to other types of surgery +/- anti-microbials (19/32, 59.4%) for granulomatous nontuberculous lymphadenitis in children.

	Surgery types	Complete Resolution
Surgery only (n=25)	Incision and drainage (n=2)	1/2 (50.0%)
	Complete excision (n=23)	21/23 (91.3%)
Surgery + anti-microbials* (n=45)	Incision and drainage (n=24)	16/24 (66.7%)
	Partial excision (n=6)	2/6 (33.3%)
	Complete excision (n=15)	12/15 (80.0%)

Table 1. Treatment and outcome.

* Anti-microbials included ≥ 1 of clarithromycin, rifampicin, ethambutol or isoniazid of various duration.

ESPID-0710

INFANTILE BRUCELLAR PNEUMONIA

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Introduction: Pulmonary involvement due to Brucella is a rare entity. Human-to-human transmission is a rare mode of transmission.

Case Report: An asymptomatic 3-month-of boy was brought upon maternal neurobrucellosis. His mother had associated complaints during pregnancy. The baby was exclusively fed by breast milk and had no suspicious contact. He looked healhty otherwise mild tachypnea. Chest X-ray, abdominal ultrasonography, echocardiography, and cerebrospinal fluid (CSF) examinations revealed no positive findings. Brucellar serum agglutination test (SAT) was 1/640. The CSF and blood cultures yielded no growth while bone marrow culture was positive for *Brucella melitensis.* Culture of breast milk was negative but *Brucella melitensis* polymerase chain reaction (PCR) was positive, so he was separated from breast milk. After 2 weeks of the completion of 45-day-treatment of trimethoprim-sulfamethoxazole and rifampicin, he admitted again with cough and tachypnea. Chest radiography showed atelectasis and pneumonic infiltrates. Due to unresponsiveness to empirical ampicillin-sulbactam therapy, re-investigation was made in case of brucellar pneumonia. Blood, bone marrow cultures, and SAT were negative. On thoracic computed tomography, right hilar 7 mm lymphadenopathy, and multipl well-bordered fibrotic, atelectatic findings were shown. Tuberculin skin test and other diagnostic tests for tuberculosis from gastric aspiration materials (GAM) were negative. *Brucella melitensis* PCR was found positive in GAM. Trimethoprim-sulfamethoxazole, gentamicin, and rifampicin were started for brucellar pneumonia and all of his complaints subsided without complication with 4 months of treatment.

Conclusions: Brucellosis can transmit transplasentally or by breast milk from mother to baby. Focal infections like pneumonia may cause the disease relapses.

ESPID-0711

LASSA FEVER AND MALARIA PARASITAEMIA IN CHILDREN WITH CONVULSIONS ASSOCIATED WITH FEVER IN ENDEMIC AREAS

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Introduction: There is a dearth of data on the prevalence of Lassa fever (LF), its role in childhood convulsions associated with fever (CAWF) and its relationship with malariaparasitaemia (MP), the commonest cause of acute febrile illnesses and CAWF in tropical Africa. These issues are of practical importance in the practice of child health in the tropics.

Objectives: To determine the prevalence and relationship of LF and MPin febrile children with CAWF.

Methods: Prospective study of 373 consecutive children aged ≥1 month – 15 years with admitted to the Children's Emergency Room of Irrua Specialist Teaching Hospital over a 1 year period. The children were evaluated clinically followed by laboratory tests (including blood smears for MP and Lassa virus reverse transcriptase polymerase chain reaction, LV-RT-PCR, test). LF was defined as the presence of a positive LV-RT-PCR test.

Results: The prevalence of infections in CAWF (n = 108) was LF = 0, MP = 44 (40.7%) and LF + MP = 3 (2.8) versus 9 (3.4%), 36 (13.6%) and 1 (0.4%) in children with fever but no convulsions (n = 265) (p<0.0001). 3/3 with LF and CAWF versus 1/10 with LF only (Fisher exact p= 0.028) had co-infection with MP. Mortality rate was 3/13 in children with LF versus 10/348(p = 0.017) in other infections.

Conclusion: LF is an important cause of fever in endemic areas, but it has no significant relationship with CAWF. However, malaria co-infection may be important in the pathogenesis of convulsions in LF.

ESPID-0712

KERION CELSI AFTER ACUTE TRAUMA TO SCALP: A CASE REPORT

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INTRODUCTION: Kerion celsi is an inflammatory form of tinea capitis. It usually evolves after a pet contact carrying a dermatophytic infection. The disorder has rarely been reported after acute trauma to scalp.

CASE REPORT: A 7-years-old girl admitted to another hospital with multiple 2-3 cm diameter swellings and one 6x8 cm wide erythematous scalp lesion with partial hair loss present for 15 days. She had been treated as bacterial subcutaneous skin abscesses with no improvement. She was referred to our clinic. She reported that she had a previous head trauma over the place of largest lesion. Cultures from pyogenic deep abscesses were sterile. KOH examination was not helpful for diagnosis. Culture for definite fungal agent has been pending. She was diagnosed clinically as tinea capitis with kerion celsi. Griseofulvin is the preferred drug but is not available in our country. The patient was put on oral terbinafine therapy and a 7-day course of low-dose steroid was given to suppress intense inflammation; along with antiseptic wet dressings and shampooing with antifungal. Partial regression has been observed and the case is still under follow-up.

CONCLUSION: Kerion celsi is a T-cell–mediated hypersensitivity to the causative dermatophyte. It may lead to permanent hair loss and early diagnosis is of paramount importance to avoid unnecessary and inappropriate surgical intervention. Tinea capitis is predominantly a disease of preadolescent children and kerion celsi should be considered in differential diagnosis of any scalp wound unresponsive to usual therapeutic modalities.

ESPID-0714

CYTOKINE PROFILE AND RADIOGRAPHICAL ABNORMALITIES IN COMMUNITY-ACQUIRED PNEUMONIA AMONG CHILDREN

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Aims: To assess association between the cytokine profile and radiographical abnormalities in children with community-acquired pneumonia(CAP).

Methods: Children <5-years-old hospitalized with CAP were investigated in a prospective study at Federal University of Bahia Hospital, in Brazil. On admission, clinical data and biological samples were collected to investigate 18 etiological agents and determine serum cytokine levels (IL-8,IL-6,IL-10,IL-1β,IL-12,TNFα,IL-4,IL-5,IFNγ,CXCL10,CCL5,CCL2, and CXCL9); chest radiographs(CXR) were read by a blinded pediatric radiologist.

Results: From 252 enrolled patients, 205(81.3%) had the etiology determined. Radiographic diagnosis of pneumonia was confirmed in 162(79.0%) cases, with detection of pulmonary infiltrate (n=155;95.7%) or pleural effusion(PE) (n=18;11.1%). Out of 43(21.0%) CXR without pneumonia, 35(81.4%) were normal and 8(18.6%) had other abnormalities. Viral, typical bacterial and atypical bacterial infections were detected in 105(51.2%), 67(32.7%) and 33(16.1%) cases, respectively. Table 1 assesses the comparison of cytokines between different radiographic subgroups, table 2 presents the comparison between cases with and without PE and table 3 shows the cytokines concentrations within the etiologic subgroups. IL-1β,IL-4,IL-5,IFNγ,CXCL9, and CCL5 did not show detectable levels. By multivariate analyses, IL-6 was directly associated (OR=2.5;p=0.013;IC95%=1.2–5.3) and IL-10 was inversely associated (OR=0.4;p=0.01;IC95%=0.2-0.8) with radiographically-confirmed pneumonia; IL-6 (OR=11;p=0.003;IC95%=2.3-53) and IL-8 (OR=3.5;p=0.037;IC95%=1-11.1) were directly associated with PE.

Conclusions: High IL-6 and low IL-10 levels are independent risk factors for radiographically-confirmed pneumonia. High IL-6 and IL-8 levels are independent risk factors for PE.

Table 1. Comparison of median (interquartile range) concentrations (pg/ml) of cytokines and chemokine between patients with radiographically confirmed pneumonia and other different radiographic diagnoses

Cytokines	Radiographic diagnoses						
	Pneumonia n=162	No pneumonia n=43	P	Normal n=35	P	Other n=8	P
IL-8	87.3 (31.0–239.4)	64.0 (14.1-151.8)	0.2	64.0 (17.5-188.9)	0.3	47.2 (9.9-148.9)	0.3
IL-6	4.7 (0-27.0)	0 (0-3.6)	0.01	0 (0-6.4)	0.04	0 (0-2.7)	0.1
IL-10	9.0 (8-10.3)	9.7 (8.7-11.5)	0.006	9.6 (8.7-11.2)	0.03	10.5 (8.8-12.0)	0.04
IL-12	5.5 (4.7-7.0)	5.7 (4.7-6.8)	0.8	5.6 (4.7-6.7)	0.7	6.8 (5.3-8.0)	0.2
TNFα	2.8 (2.1-4.2)	3.0 (2.3-4.3)	0.7	2.7 (2.1-3.7)	0.5	4.6 (3.8-6.9)	0.01
CXCL10	74.7 (36.1-149)	67.6 (32.2-136.6)	0.6	66.3 (30.5-148.5)	0.6	68.8 (32.8-122.9)	0.7
CCL2	19.3 (10.2-23.2)	18.5 (9,4-24.3)	0.6	18.9 (9.8-24.8)	1.0	11.8 (8.3-19.1)	0.2

Table 2. Comparison of median (interquartile range) concentrations (pg/ml) of cytokines and chemokine between patients with and without pleural effusion

Cytokines	**Pleural effusion**		**P**
	Yes (n=18)	No (=187)	
IL-8	167.1 (81.7-421.4)	71.7 (24.3-203.4)	0.03
IL-6	26.5 (15.1-100.4)	0 (0-16.3)	< 0.001
IL-10	8.8 (7.7-9.4)	9.2 (8.1-10.6)	0.2
IL-12	5.4 (4.4-6.6)	5.6 (4.7-7.0)	0.4
TNFα	2.3 (1.4-3.1)	3.1 (2.1-4.4)	0.03
CXCL10	76.5 (31.2-275.2)	74.2 (35.3-133.2)	0.6
CCL2	16.3 (6.6-19.7)	19.4 (10.1-23.7)	0.1

Table 3. Median (interquartile range) concentrations (pg/ml) of cytokines and chemokine by etiological subgroups

Cytokines	**Etiology**		
	Viral n=105	Typical Bacteria n=67	Atypical Bacteria n=33
IL-8	71.1 (30.8-173.2)	126 (34.3-307.1)	44.4 (18.9-160)
IL-6	0 (0-15.8)	10.1 (0-50.4)	0 (0-3.8)
IL-10	9.3 (8-10.9)	8.9 (8.2-9.9)	9 (8-10.4)
IL-12	5.8 (4.8-7)	5.5 (4.9-7.2)	4.9 (4.2-6.1)
TNFα	3.2 (2.1-4.2)	2.8 (2-4.9)	2.8 (2.2-3.4)
CXCL10	73.4 (32.8-141.5)	90.8 (37.4-168.6)	73.8 (33.7-131)
CCL2	19.1 (9.9-23.6)	18.9 (9.6-22.3)	20.1 (11.6-24.4)

ESPID-0715

THE RISK FACTORS OF VENTILATOR ASSOCIATED PNEUMONIA DUE TO CARBAPENEM-RESISTANT ACINETOBACTER AND PSEUDOMONAS SPECIES IN PEDIATRIC PATIENTS

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Introduction: Infections due to carbapenem resistant pathogens have become a major health threat for especially hospitalized patients. *Acinetobacter* and *Pseudomonas* species are important nosocomial microorganisms causing ventilator-associated pneumonia (VAP) with high resistance to carbapenems.

Methods: Between 2009 and 2012, an active, prospective surveillance study based on patient and laboratory data was conducted in Gazi University Hospital. All children from pediatric intensive care unit (ICU), neonatal ICU, and surgical ICUs, between 1 month and 18 years of age with VAP due to *Acinetobacter* and *Pseudomonas* species, based on CDC criteria were included.

Results: During this period, there were totally 202 VAP episodes. *Acinetobacter* (n=65, 36.1%) and *Pseudomonas* (n=65, 36.1%) species were the most frequent causative agents. Among these, 92.3% (n=60) of *Acinetobacter* and 53.8% (n=35) of *Pseudomonas* species were carbapenem resistant. *Acinetobacter* and *Pseudomonas* VAP episodes were mostly seen (n=113, 86.9%) in pediatric ICU. While no significant differences were found between carbapenem resistant and sensitive *Acinetobacter* spp. regarding risk factors; antacid usage, presence of central/peripheral catheters, prior use of cefepime, ciprofloxacin, and teicoplanin were found to be associated with carbapenem resistant *Pseudomonas* (CRP) VAP (p=0.01, p=0.02, p=0.01, p=0.01, and p=0.002 respectively). In logistic regression analysis, previous use of ciprofloxacin (OR, 6.013; 95% CI, 1.131–31.958, p=0.013) and teicoplanin (OR, 5.869; 95% CI, 1.623–21.221, p=0.002) were found independently associated with CRP VAP.

Conclusions: Nosocomial infections due to carbapenem resistant *Pseudomonas* and *Acinetobacter* species are significant cause of morbidity and mortality. Rational antibiotic use and infection control measures are important.

ESPID-0717

EPINEPHRINE VERSUS PLACEBO IN HOSPITALIZED INFANTS WITH BRONCHIOLITIS TREATED WITH HYPERTONIC SALINE SOLUTION

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Introduction: No bronchodilator nebulized in saline has proven to be more effective than saline alone. The efficacy of adrenaline in hypertonic saline solution has not yet been studied.

Aims: To determine the utility of nebulized adrenaline in hypertonic saline solution to treat acute bronchiolitis in moderately ill hospitalized infants.

Methods: Randomized, double-blind, controlled trial. One hundred and fifty four hospitalized infants (age 1.98 ± 2.32 months (mean ± SD)) with acute bronchiolitis received either nebulized adrenaline, 3 mg, in 7 ml of 3% hypertonic saline solution (group SSH3%+A; n = 77) or placebo, 3 ml, in 7 ml of 3% hypertonic saline solution (group SSH3%+P; n = 77), in addition to routine therapy. Nebulisations were initially administered every four hours and adjusted thereafter according to clinical response. The principal outcome measure was hospital length of stay (LOS). The significance level was established at 95% ($p < 0.05$).

Results: On an intention-to-treat basis, the infants in the SSH3%+A group had a clinically relevant reduction in LOS to 2.83 ± 1.27 days, compared with 3.77 ± 2.37 days in the SSH3%+P group ($p = 0.014$), severity scores ($p = 0.003$) and respiratory rates (0.017). The treatment was well tolerated, with no adverse effects.

Conclusions: The use of nebulized adrenaline in hypertonic saline solution is safe and effective in acute bronchiolitis for moderately ill hospitalized infants.

ESPID-0718

EVALUATION OF A CLINICAL SCORE AS PREDICTOR OF THE LENGHT OF HOSPITAL STAY IN ACUTE BRONCHIOLITIS

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Introduction: Wood Downes's modified by Ferres score (WDF) was not designed for bronchiolitis, but it has been used to evaluate their severity.
Aims: Our aim is to relate the length of stay and the bronchiolitis´s severity by WDF.
Methods: acute bronchiolitis hospitalized during two epidemics (2011-2013) were included, classified as mild (mB; WDF <4), moderated (MB; WDF 4-7) or severe (SB; WDF> 7) according to the WDF score at admission. The mild ones were excluded as well as patients without WDF at admission. The main variable was length of stay. We registered: age, RSV, sex, previous treatment and treatment during length of stay. Analysis with SPSS 17.0.

Results: 208 patients were included, 55,3 % males, mean age of 72,9 days (5-373). Positive RSV in 67,8 %. Before admission they received salbutamol (26,9 %), corticoids (21,2 %) and antibiotics (6,3 %). Mean WDF was 5,42 (4-10). 90,5 % was MB and 9,5 % SB. During the stay, they received nebulized salbutamol (11 %), SSH3% with adrenaline (55 %) and SSH3 % (34 %). 22% received corticoids and 8,2% antibiotics. 12,5 % needed admission in UCIP. Length of stay: 5,3 days (0-46). The BM had an mean length of stay of 4,8 days and the BG of 13,44 ($p = 0.0001$).

Conclusions: WDF score has demonstrated, in our sample, to be a good predictor of the length of stay in moderate and severe bronchiolitis. SB had a statistically significant higher mean length of stay.

ESPID-0720

NOSOCOMIAL INFECTIONS IN A PORTUGUESE NEONATAL INTENSIVE CARE UNIT OVER A 5-YEAR PERIOD

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Background and aims

Nosocomial infections (NI) are a major cause of morbidity, mortality and prolonged length of hospital stay among preterm neonates in neonatal intensive care units (NICU). This study aims to characterize NI in a NICU over a 5-year period.

Methods

Retrospective review of NI in a secondary care hospital NICU. Data collected from January 2009 to December 2013, through the database of the national surveillance programme of nosocomial infections in NICU.

Results

During the 5-year period, 884 neonates were admitted, 326 with very low birth weight (VLBW), 58 submitted to major surgery. The admissions accounted for 17266 days, 3320 ventilation days and 6191 days of central venous catheters (CVC). A total of 262 infections were diagnosed in 137 neonates (109 VLBW) with bloodstream infection (48%) and pneumonia (11%) accounting for the majority. Device associated infection rates were: 19 primary bloodstream infections per 1000 central-line days and 12 pneumonias per 1000 ventilator days. A microorganism was isolated in 58% of NI's episodes. Staphylococcus epidermidis (80% oxacillin, 0% vancomycin resistant), other coagulase-negative staphylococcus (91,7% oxacillin, 0% vancomycin resistant) and klebsiella pneumoniae (100% ampicillin, 0% amikacin resistant) were the most common agents isolated from cultures.

Conclusions:

Epidemiologic surveillance of NI is essential to achieve an understanding on trends of infection, causative microorganisms and its resistance. Our data are consistent with the Portuguese national results. Nevertheless, we aim to improve our practices and reduce infection rates by adaptation of new strategies, strict protocols and the education of NICU physicians and nurses.

ESPID-0721

SAFETY OF NEBULIZED ADRENALINE AND 3 % HYPERTONIC SALINE SOLUTION IN BRONCHIOLITIS

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Introduction: The use of nebulized adrenaline in the treatment of infants with acute bronchiolitis, has been related to increased cardiac rate. On the other hand, bronchoconstriction episodes requiring bronchodilators have been reported with the use of nebulized 3% hypertonic saline solution (3%SSH) without bronchodilators.
Aims: We aimed to analyze the safety of nebulized adrenaline and nebulized 3% HSS in the management of infants hospitalized for acute moderate bronchiolitis

Methods: Randomized, double-blind, controlled trial. One hundred and fifty four hospitalized infants (mean age 1.98 ± SD 2.32 months) received nebulized 3%HSS (7 ml) either with 3 mg of adrenaline (group SSH3%+A; n = 77) or 3 ml of placebo (group SSH3%+P; n = 77), in addition to routine therapy. Nebulisations were initially administered every four hours and adjusted thereafter according to clinical response. The principal outcomes measures were cardiac rate (CR) up to the median of stay, nebulisation requirements and need of transfer to the pediatric intensive care unit (PICU).

Results: There was not statistically significant differences in the cardiac frequency in 3 days of median of stay (p = 0.33, 0.58 and 0.50, respectively), nebulisations rates (p=0.94), PICU's admission (p= 1). No other adverse events were reported.

Conclusion: Nebulized adrenaline and nebulized 3%HSS are safe in acute bronchiolitis for moderately ill hospitalized infants.

ESPID-0722

NASOPHARYNGEAL CARRIAGE OF NEISSERIA MENINGITIDIS: A SMALL-SCALE SURVEY IN ISTANBUL, TURKEY

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Background and aims

Neisseria meningitidis is one of the common causes of bacterial meningitis in Turkey, especially after the national immunization programme including conjugated pneumococcal and *Haemophilus influenzae* type b vaccines.

Although asymptomatic carriage is common, few carriers develop invasive disease. We investigated the prevalence of nasopharyngeal carriage of *N. meningitidis* in 1000 healthy children and adults.

Methods

In 18-months period in 2012 and 2013, nasopharyngeal swabs were collected from 1000 healthy children and adults in Istanbul. Swab samples obtained from posterior nasopharynx, were immediately inoculated into modified Stuart transport medium tubes and, then inoculated onto 5% blood agar and Thayer-Martin agar. Suspected colonies were confirmed by API-NH (BioMerieux, France).

Results

Six hundred and sixty seven (66,7%) subjects were female and 333 (33,3%) subjects were male. 131 of them were younger than 12-months of age and mean age was 2.7 months. 869 of them were older than 12 months of age and mean age was 27 years.

N. meningitidis carriage were detected in 6 (0.6%) of 1000 subjects. All of them were adults. *N. lactamica* was detected in 13 subjects (1.3%). All of them were adults.

Conclusions

Carriage rate of meningococci in our study was relatively low. The accurate incidence of meningococcal carriage and disease in Istanbul is not known. This should be verified with a multicenter national survey.

ESPID-0723

INFECTIVE ENDOCARDITIS DUE TO GRANULICATELLA ADIACENS IN A 7-YEAR-OLD BOY WITH VENTRICULAR SEPTAL DEFECT

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Background: *Granulicatella adiacens*, formerly known as one of the nutritionally variant streptococci, is a normal commensal of human mucosal surfaces, inhabiting the oral cavity, urogenital and gastrointestinal tracts and rarely causing disease. Endocarditis due to this gram-positive bacterium is extremely rare in childhood. We report a case of infective endocarditis (IE) caused by this fastidious microorganism in a child with ventricular septal defect (VSD).
Case report: A 7-year-old boy was admitted to our center with fever of unknown origin. He have had relapsing fever and abdominal pain for six months. His past medical history was unremarkable except VSD. At admission, he presented with general malaise, pale skin, splenomegaly and a systolic murmur. Laboratory tests revealed a white blood cell count of 12,600/mm^3 with 65% neutrophils and CRP 6.98 mg/dL. A mobile, hyperechogenic, vegetative mass on the tricuspid valve pouch was identified by transthoracic echocardiography. Blood cultures were obtained and empiric antibiotic treatment with ceftriaxone and gentamicin was started. *G.adiacens* was isolated from four of his blood culture samples, which was sensitive to beta-lactams, tetracycline, vancomycin, moderately sensitive to gentamicin, and resistant to co-trimoxazole. The child recovered completely on treatment with high dose of ampicillin and gentamicin for 28 days.
Conclusion: Normal human commensal *G.adiacens* may be the causative agent of IE in children with congenital heart defect. Since *G adiacens* is a nutritionally deficient bacterium, it may fail to grow on conventional culture media, and it can be difficult to identify.

ESPID-0724

EPIDEMIOLOGICAL AND CLINICAL CHARACTERISTICS OF CLOSTRIDIUM DIFFICILE INFECTION IN CHILDREN - THE EXPERIENCE OF A SINGLE CENTER

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Introduction: The incidence of Clostridium difficile infection (CDI) in children is progressively increasing lately.

Aims: The study aimed to evaluate the epidemiological and clinical characteristics of CDI in children.

Methods: We performed a retrospective study that analysed the cases diagnosed with CDI in Grigore Alexandrescu Emergency Children's Hospital, Bucharest, cases identified through enzyme immunoassays for A toxin or for A and B toxin of Clostridium difficile in the stool.

Results: Between January 1st 2005 and December 31st 2013, 52 episodes of CDI were diagnosed in 42 patients. We noticed an increasing incidence reaching a maximum in 2012, 3.3 cases/1000 patients. A large number of cases (53.8%) were diagnosed in the age group 1 to 4 years. The sex ratio was M/F =0.8/1. 33.3% of patients had community-acquired CDI. We report 7 cases of recurrent CDI (13.4%). Seventeen patients (40.4%) presented with bloody diarrhea. We had 38 cases of mild to moderate forms of CDI and 4 cases with severe forms, one of which was confirmed to be pseudomembranous colitis. Seventeen patients (40.4%) had associated comorbidities: 8 cases had severe comorbidities (Hirschsprung disease, ulcerative colitis) and 9 were diagnosed with food allergies (especially cow's milk allergy) and/or Ig A deficiency.

Conclusions: Our study shows a significant increase of CDI cases. The majority of patients in the study group were 1 to 4 years aged children. One third of patients had community-acquired CDI. 40% of patients associated comorbidities, the most frequent being the cow's milk allergy.

ESPID-0725

PREVENTION OF STAPHYLOCOCCUS AUREUS POSTOPERATIVE INFECTIONS IN PEDIATRIC CARDIAC SURGERY

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Objective: Nasal carriage of Staphylococcus Aureus (SA) increased the risk of SA postoperative infection. The aim of this study was to assess preoperative elimination of SA nasal carriage for children who had cardiac surgery.

Methods: From October 2011 till October 2013, pediatric patients undergoing cardiac surgery were screened for SA nasal carriage 10 to 15 days before surgery. Since November 2012, patients with SA carriage were treated prophylactically with mupirocin nasal ointment and chlorhexidine gluconate medicated soap for seven days until the surgery. We compared the postoperative SA infection rate between two periods, before and after beginning prophylactic treatment.

Results: Two hundred thirty seven patients were included. The overall rate of colonization of SA was 19.4 %. Before prophylactic treatment, 109 patients were screened and 16 of them (14.7%) were colonized at admission. We observed also 4 postoperative SA infections during this period and two of them were colonized before the surgery.
One hundred twenty eight patients were screened after November 2012, 30 (23,4%) were SA nasal carriers. We observed 3 postoperative SA infections: none of them were colonized before the surgery.

Conclusion: We observed a reduction of postoperative SA infections after the beginning of preoperative decontamination of SA nasal carriage. However, a significant difference could be highlighted with more patients included.

ESPID-0726

RESPIRATORY VIRAL INFECTION IN A NEONATAL UNIT

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Introduction: Respiratory viral infections are ubiquitous in the community and among children admitted to hospital.

Objectives: To investigate perinatal and postnatal respiratory viral infection in infants admitted to a tertiary referral neonatal unit during a five year period from 1st January 2009 to 31st December 2013.

Methods: The following viruses were tested: Respiratory Syncytial Virus (RSV), Influenza A and B, Parainfluenza 1, 2, 3 and Adenovirus. Human Metapneumovirus was tested from 1st September 2011. An infection was considered perinatal if the infant presented with symptoms at birth or shortly after birth within the incubation period. An infection was considered postnatal if the infant developed symptoms when the baby was older than the recognised incubation period.

Results: During the study period, 46,831 infants were born at the hospital and 64 mothers had Influenza infection diagnosed. There were 7,293 admissions to the neonatal unit, excluding infants admitted for less than four hours. Nasopharyngeal aspirates were obtained from 135 infants. Thirteen respiratory infections were confirmed: nine RSV, two Influenza A, one Parainfluenza 3 and one Adenovirus. The Adenovirus infection was acquired perinatally; this baby required ECMO and subsequently died. All other infections were acquired after birth. No other baby died, although RSV infection was associated with significant morbidity including ventilation.

Conclusions: Respiratory viral infections are uncommon in our neonatal unit, occurring in 0.18% of admissions. Most infections are acquired after birth. Perinatal respiratory viral infection is rare but can be associated with a high mortality. Influenza is rarely transmitted from mother to baby.

ESPID-0727

ANALYSIS OF INVASIVE MENINGOCOCCAL DISEASE (IMD) IN CHILDREN IN IRELAND IN THE 21ST CENTURY TO INFORM MENB VACCINE PLANNING

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Background:

IMD was hyperendemic in Ireland, at 14.75/100,000 in 1999, with 60% Serogroup(Sg)B, 30% SgC. Meningococcal C Vaccine (MCV) in 2000 virtually eliminated SgC. Spontaneous decline in SgB resulted in 2012 rate of 2.2/100,000.

Aims:

Determine IMD epidemiology and disease outcome in children in Ireland since MCV introduction. Review clinical presentation and hospital course to ascertain impact of national sepsis guidelines and generate data to inform decisions regarding MenB vaccine.

Methods:

All confirmed cases of IMD, 2001-2011, from 2 tertiary paediatric hospitals identified from the Irish Meningococcal Reference Laboratory had charts reviewed using standardised assessment tool. A prevaccine study of 407 IMD cases provided comparative data.

Results:

382 cases, 225 (59%) male, median age 1.5 years (range 0.1-18 yrs) were identified. Serogroup distribution: B 360(94%), C 12(3%) , W135 5(1%), Y2 2(1%), NG 3(1%).

	Pre MCV 1995-2000	Post MCV 2001-2011	P value
Fever	97%	82%	0.0001
Lethargy	36%	51%	0.0001
Neck stiffness	5%	10%	0.0001
Pallor	5%	37%	0.0001
Morbidity	10.8%	9.4%	0.29
Mortality	4.6%	3.6%	0.2

ICU admissions remained similar(62vs61%). Despite more interventions no significant change in outcome found. 15 patients died. 4 were dead on arrival or died in ED. Median time to death was only 5 hours for 11 children admitted to ICU. 10% mortality for transfers from another hospital.

Conclusion:

Despite MCV success and sepsis guidelines, incidence reduction has not coincided with improved outcome for those children with IMD. Children who die are critically ill before receiving medical attention, highlighting the need for a vaccination strategy.

ESPID-0728

PREVALENCE OF LASSA FEVER IN CHILDREN RELATIVE TO ADULTS IN ENDEMIC AREAS: THE NIGERIAN EXPERIENCE

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Introduction: Lassa fever has been thought to be of lower prevalence and lesser severity in children compared to adults in endemic areas in West Africa but the situation in Nigeria, which is plagued with a high burden of LF and malaria as well as multiple strains of the Lassa virus, is unknown. Investigation of these issues may be relevant to the practice of child health in the tropics.

Objectives: To determine the relative prevalence and severity of LF in febrile children relative to adults in an endemic area of Nigeria.

Methods: Prospective study of febrile patients screened for LF based on the presence of defined criteria (fever of 38^{o}C for at least 2 days or fever with bleeding or facial oedema or fever unresponsive to antimalarials or antibiotics after 2 days of treatment or fever in known contact) from 2010-2014. LF was defined as the presence of a positive Lassa virus reverse transcriptase polymerase chain reaction test in a febrile patient.

Results:40/691 (5.8%) febrile children (≤15 years old) versus 437/4808 (9.1) febrile adults had LF (OR (95% CI) of LF in febrile adults = 1.63 (1.17, 2.27), p = 0.005). Case fatality rate in febrile patients with LF was 120/437 (27.5%) in adults versus 6/30 (20%) in children (OR (95% CI) = 1.51, 3.80), p = 0.498).

Conclusions: The prevalence of LF in febrile children in endemic areas is lower but the severity is comparable. Equal or greater aggressiveness is required in the management of LF in childhood.

ESPID-0729

INTUSSUSCEPTION AS A COMPLICATION OF ROTAVIRUS INFECTION IN CHILDREN

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Introduction

In Poland, rotavirus infections are still prevalent etiological factor of acute gastroenteritis in children. In most cases the clinical course of these infections is mild, although more often require hospitalization. Complications in the form of intussusception, or intestinal pneumatosis determine severe disease.

Aim of the study

Discussion of the clinical course of four children with acute course of rotavirus infection with the occurance of intussusception and / or intestinal pneumatosis.

Methods

Retrospective analysis constituted 613 children hospitalized in the Department of Pediatrics, Medical University of Silesia in Katowice in 2013 due to acute gastroenteritis, in 276 of cases (45%) rotavirus infection was etiological factor. Complications in the form of intussusception and / or intestinal pneumatosis were noted in 4 children, in the aged from 2.5 to 7.5 years (1.45%), with severe form of disease.

Results

In two children accompanying pneumonia was observed, furthermore in one of them reduced levels of platelets were shown. In 1 child, so far healthy, apart from intussusception occurred haemolytic uraemic syndrome. In the oldest girl with a history of food allergy and with IgA and IgG deficiency occurred both intussusception and intestinal pneumatoza. Intussusception occurred in 3-4 day of acute gastroenteritis, while pneumatoze intestines was observed in the first day of disease duration.

Conclusions

Children with severe course of acute gastroenteritis require intensified control in the direction of complications in the form of intussusception and intestinal pneumatosis.

ESPID-0730

ROTAVIRUS DIVERSTY IN EUROPEAN COUNTRIES WITH AND WITHOUT ROTAVIRUS VACCINATION: 7 YEARS OF ROTAVIRUS STRAIN SURVEILLANCE

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Introduction

EuroRotaNet, has been conducting rotavirus strain surveillance for 7 consecutive years in 16 European countries

Aims:
To develop and apply methods for rotavirus characterisation, monitor their effectiveness, describe the molecular epidemiology, emergence and spread of novel strains, and develop an infrastructure for evaluating the impact of rotavirus vaccination on rotavirus ecology.

Methods:

Rotavirus-positive faeces obtained from routine diagnosis. Strains are G and P genotyped using standardised RT-PCRs, unusual strains characterised further by sequence analysis.

Results:

A total of 51,183 strains were genotyped between 2007 and 2013 and 48 G/P combinations identified in Europe. G1P[8], G4P[8], G2P[4], G9P[8], G3P[8] constituted >90% of the strains typed and G12P[8] were identified in more than 1% of the total: The relative frequency of the different rotavirus genotypes and temporal distribution of infections vary significantly between seasons and countries independently of vaccination.

The data suggest that rotavirus vaccines provide cross-protection against the rotavirus strains found in Europe. A relative increase in circulation of G2P[4] strains in older individuals and in some countries with rotavirus vaccine may be the result of differences in cross-protection against strains of different genogroups.

Conclusions:

To date there is no suggestion that rotavirus vaccines have resulted in selection of unusual rotavirus strains. Relative increases of G2P[4] strains in some vaccinated populations need to be interpreted in the context of a reduction in the number of rotavirus diarrhoea cases. Determining whether cross-genogroup protection is less efficacious than cross-genotype protection is important for assesingthe potential long term effects of rotavirus vaccination.

ESPID-0731

PROBIOTIC SUPPLEMENTATION IN PRETERM NEWBORN INFANTS: EFFECT ON INTESTINAL BACTERIAL COLONIZATION AND INCIDENCE OF LATE NEONATAL SEPSIS

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Introduction: Probiotic supplementation in neonates is an important clinical problem.There are a lot of unresolved issues regarding the efficacy and safety ,especially in preterm neonates.
Objectives: To determine the efficacy of probiotics in high risk preterm infants for prevention of late neonatal sepsis ,necrotizing enterocolitis (NEC) and intestinal colonization by potentially pathogenic bacteria and Candida species.
Aims: To analyze the effect of probiotics on the incidence of late neonatal infection in preterm infants and the type of intestinal bacterial colonization.
Methods: 99 preterm infants treated in NICU (49) and Special Care Unit (50).The intestinal bacterial colonization was assessed before and after the treatment with probiotic containing Bifidobacterium lactis, Lactobacillus acidophilus and Streptococcus thermophilus. The control group consisted of 30 preterm neonates. We analyzed the incidence of NEC, late neonatal sepsis and the type of intestinal bacterial colonization in target and control groups. The mean duration of supplementation was 20 days.
Results: 22 preterm infants from the NICU group were colonized by ESBL Klebsiella pneumoniae. The colonization was eliminated in all patients after the probiotic course.In the Special Care Unit group Candida colonization was significantly reduced. No case of NEC was diagnosed in the whole study population. The incidence of late neonatal sepsis was slightly higher in the control group, but without statistical significance.There was no evidence of neonatal infection, caused by probiotic bacteria.
Conclusions: Probiotic supplementation in preterm infants is safe and is very effective in the process of elimination of potentially pathological intestinal bacterial colonization.

ESPID-0732

MULTIDRUG-RESISTANT TUBERCULOSIS(MDR-TB)INFECTION IN BELGIUM: REPORT OF TWO CASES

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Drug resistant TB is rare in children in countries with low TB incidence. We report a 16 month-old child with pre-XDR miliary TB and a 3-year-old boy with MDR Pott's disease. *Mycobacterium tuberculosis* and resistance to rifampicin were identified by molecular test (Xpert®) on gastric aspirate fluid and bone biopsy specimen respectively. Both were negative for HIV. Except for young age and radiological features of advanced disease in a child emigrating from Somalia, no risk factor of MDR-TB was noticed in the first case. MDR-TB was suspected in the second child of East-European origin because parents recalled a contact, one year before, with a distant relative diagnosed with smear-positive pulmonary MDR-TB. Treatment was individualized according drug susceptibility testing results and both children showed clinical and radiological evidence of cure. Amikacin was administrated in both regimens with quinolone only in the second case. Both children presented abnormal brainstem auditory evoked responses (BAER), requiring hearing aid. This complication happened 2 months after amikacin had been stopped (8 months in total) for the first case, and during the fourth month of treatment for the second. Childhood TB does not spare any country in Europe. High levels of awareness are necessary to ensure not only to think about TB but to consider drug-resistant TB in any child. Attention should be paid to timely diagnosis and adequate treatment, and also to adverse drug-reactions. Furthermore, this report highlights that, even more than in sensitive TB, contact screening remains extremely important in vulnerable populations.

ESPID-0733

TINN - TREAT INFECTION IN NEONATES - EUROPEAN NETWORK ON EVALUATION OF ANTI-INFECTIVE AGENTS FOR THE TREATMENT OF PRETERM AND TERM NEONATES

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Introduction/Background:

In contrast to the situation in adults, most medicines used to treat the children of Europe have not been tested and are not authorised for use in children: the health and therefore quality of life of the children of Europe may suffer from a lack of testing and authorisation of medicines for their use.

Objectives/Clinical Studies:

In this context, the European Medicines Agency has identified a priority list of the therapeutic areas that need specific drug evaluation in neonates. Among these priority medicines, *Ciprofloxacin* and *Fluconazole* are prescribed off-label to treat infections that can make babies seriously ill or even kill them.
To improve the situation, the TINN project was selected by the European Commission in 2008 to conduct *two clinical trials to evaluate the utility and safety of these two drugs*.

Preliminary/Expected outcomes:

Major achievement have been obtained for both drugs during the last five years:
- Literature reviews were performed,
- A european survey was organized to evaluate their use in NICUs over Europe,
- Juvenile animal studies were conducted,
- A ciprofloxacin pharmacokinetic and safety study was conducted, and a population modeling was performed.

In December 2013, the European Commission accepted a project extension for 24 months (up to October 2015) that will also allow:
- To evaluate long-term safety of ciprofloxacin in terms of arthrotoxicity (Magnetic Resonance Imaging study),
- To achieve a randomized pharmacokinetic/pharmacodynamic study of fluconazole and micafungin
- And to perform a non-invasive complementary safety study of fluconazole, in neonates receiving concomitant treatment of fluconazole and ibuprofen.

ESPID-0734

INCIDENCE RATES AND MORBIDITY OF URINARY TRACT INFECTION IN A PROSPECTIVE COHORT OF CHILDREN UNDER 6 YEARS OF AGE

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Background/aims: Information on epidemiology of childhood urinary tract infection (UTI) is scarce and based mostly on retrospective data. We investigated incidence and morbidity of UTI in a prospective cohort of children with a 6-year longitudinal follow-up.

Methods: A representative cohort of 1049 neonates born in our area during 2004/2005 was recruited and first UTI episodes were recorded through maternal recall in standardized interviews at 1 month and in 3-month intervals during the 1st year and thereafter at 6 years. Hospital records were used for re-catch and further analysis.

Results: We recorded 76 first UTI episodes (cumulative incidence 0-6 years, 7.2%; boys, 4.5%, girls 10.3%).

Age (months)	Population (n)			Incidence(/100 at risk/year)		
	Total	***Boys***	***Girls***	***Total***	***Boys***	***Girls***
Birth	1049	558	491			
0-1	1027	547	480	2.31	4.34	0.00
1-3	984	523	451	2.37	4.47	0.00
3-6	996	529	455	5.28	6.15	4.41
6-9	926	492	434	3.41	2.43	4.57
9-12	926	492	434	4.44	1.68	7.54
0-1 year	926	492	434	3.87	3.74	3.97
1-6 years	590	302	288	1.08	0.26	1.92

Full clinical information was available in 55/76 UTI episodes. Hospitalization was required for 25 (45.5%) children, 16 (29.1%) suffered recurrences, 10 (18.2%) received prophylaxis, 8 (14.5%) had urinary tract malformations, and 3 (5.45%) required surgery of whom 2 (3.63%) progressed to impaired renal function despite repeated reconstructive interventions.

Conclusions: UTI affects 7% of children by the age of 6 years. Morbidity is considerable and, despite advances in diagnosis and treatment, long-term consequences may still be encountered.

ESPID-0735

EPIDEMIOLOGY OF ROTAVIRAL INFECTION IN UNIVERSITY CHILDREN'S HOSPITAL IN LATVIA

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Rotavirus is the most common cause of severe gastroenteritis in children in Latvia. Rotaviral vaccination is reinbursed from government by 50%.

Objective. To estimate the incidence, seasonality of RVGE cases in patients treated in University Children's Hospital (UCH) and vaccination against RVGE in Latvia in 2003 – 2013.
Aim. To include rotaviral vaccination in NIP in Latvia.

Methods**.** Retrospective research, data from the UCH, Centre for Disease Prevention and Control of Latvia, Drug wholesalers in Latvia were used. Data of 5225 children (exluding 123 neonates) treated in the UCH with rotavirus positive stool samples from period of 2009 – 2013 were analysed. *SPSS Statistics* were used.

Results**.** The number of RVGE increased from 2081 cases in Latvia in total and 513 cases in the UCH in year 2003 to 3316 and 1429 cases in year 2013 accordingly. Patients *Median* age was 1,86 years, 50% of the patients were 1,09 - 3,23 y.o. According to *Pearson Chi Square test* (p<0,001) the highest incidence of the RVGE is in age groups of 1-2 years – 32,40%. Seasonality of the RVGE was peaking in March (19,04% of patients). The number of rotavirus vaccinated infants increased – from 1,0% in 2006/2007 to 13% in 2013.

Conclusions. RVGE associated with significant morbidity in Latvia. Data requires rotaviral serotype analysis for further routine rotaviral immunization in Latvia.
Part of the study "Clinical peculiarities of Rota viral infection, molecular epidemiology and health associated life quality for hospitalized children and their family members", financially supported by Riga Stradins University.

ESPID-0736

RSV INFECTION REVERS INHIBITORY EFFECTS OF BRONCHIAL EPITHELIAL CELLS ON MONOCYTES

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Respiratory Syncytial Virus is the most common viral infections for children under three years of age. Considered as the first line of defense bronchial epithelial cells (BEC) play an important role in regulating the immune response during viral infection. However, the interplay of epithelial cells and professional immune cells during RSV infection is only partly studied. The present study was performed to determine whether RSV infected bronchial epithelial cells affect the activation of monocytes during RSV infection. Whereas BECs in healthy conditions were shown to inhibit reactivity of monocytes, we hypothesized that RSV infected BECs release monocytes from inhibition. We report that direct contact of monocytes with unstimulated BEAS2B epithelial cells resulted in inhibition of TNF secretion upon activation, while epithelial cells infected with RSV or stimulated by poly I:C mimicking dsRNA activation induced a significant release of inhibition. Our study shows that the release of inhibition required a direct contact between epithelial cells and monocytes. The supernatant produced by infected epithelial cells failed to stimulate the monocytes. The role of (PD-1/PD- L1) in the release of inhibition by lung epithelial cells was investigated. The amount of TNF produced by monocytes doubled when epithelial cells and monocytes where co-incubated with anti-PD-L1 antibody. Blocking PD-L1 on RSV infected epithelial cells co-cultured with monocytes led to an increase in TNF secretion. Based on these results we conclude that epithelial cells can release monocytes and maybe other immune cells such as dendritic cells and T lymphocytes from steady-state inhibition during RSV infection.

ESPID-0737

CLINICAL VALUE OF PLASMA SOLUBLE UROKINASE-TYPE PLASMINOGEN ACTIVATOR RECEPTOR (SUPAR) LEVELS IN TERM NEONATES WITH INFECTION OR SEPSIS

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Introduction: suPAR, the soluble form of the urokinase-type plasminogen activator receptor, has been identified as a biomarker of infection in adults but its properties in neonatal infection are not known.

Objectives: To evaluate the clinical value of suPAR in the detection of neonatal infection or sepsis, discrimination between bacterial and viral infections, and monitoring the responsiveness to treatment.

Methods: Plasma suPAR levels were determined by ELISA in 47 term infected neonates (19 with bacterial and 28 with viral infections) and in 18 healthy term neonates (controls). Thirteen out of 47 infected neonates were septic. In all infected neonates, suPAR levels were repeated at 24h, 48h, 3-5 and 7-10 days following admission. Associations of suPAR with clinical and laboratory parameters including CRP, leukocyte and platelet count were assessed.

Results: Plasma suPAR levels were increased in infected neonates upon admission (5.01±1.52 ng/mL, $p<0.001$), whereas they were highest in septic neonates (6.05±1.96 ng/mL, $p<0.001$), in comparison with controls (3.61±0.74 ng/mL) and correlated positively with serum CRP levels ($r_s=0.42$, $p=0.001$). At infection subsidence, suPAR concentrations decreased significantly in comparison with baseline ($p<0.001$) but remained higher than in controls ($p=0.01$). ROC analysis resulted in significant areas under the curve (AUC) for detecting either infected (AUC=0.801, $p<0.001$) or septic neonates (AUC=0.788, $p=0.001$), but not for discriminating between bacterial and viral cause of infection.

Conclusions: SuPAR is a diagnostic biomarker of infection or sepsis in term neonates; however, can not discriminate bacterial from viral infections and also its utility for monitoring the response to treatment is questioned.

ESPID-0738

NO DETECTION BY PCR OF HIGH- AND LOW-RISK HPV IN OROPHARYNGEAL SAMPLES IN YOUNG ADULTS IN COIMBRA, PORTUGAL

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Introduction

Increases in oropharyngeal cancers among younger men without history of alcohol or tobacco use and recognition of high-risk oral HPV as an independent risk factor renders the epidemiology of oral HPV in the context of use of adolescent HPV vaccines topical. Studies of oral HPV infection report a wide range in prevalence but use different detection methods.

Objectives

We measured the prevalence of oral HPV subtypes 6, 11, 16 and 18 in young healthy adults using PCR.

Methods

Oropharyngeal swabs from 601 Portuguese university students of medicine and pharmacy, of whom 28% were male (median age 21), were screened for HPV subtypes 6, 11, 16 and 18, using: 1. Two sets of primers (GP5+/6+ and MY 9/11) with melt-curve analysis and electrophoresis gels 2. Nested PCR 3. A multiplex assay based on oligonucleotide sequences of HPV type-specific probes, and 4. Confirmatory monoplex assays on weakly positive samples.

Results

No strong positives were detected except in control material. Weakly positive samples in the multiplex were not reconfirmed on monoplex assays. Detection limits were 50 copies for HPV18 and 500 copies for HPV16.

Conclusions

This study failed to detect any oropharyngeal HPV infection among this sample of healthy young adults, the majority of whom (the females) had previously been immunised with quadrivalent HPV vaccine. Although this is reassuring, further evaluation of the sensitivity of the sampling methods and detection assays are needed to ascertain how accurately these results reflect the true incidence of infection in this and other populations.

ESPID-0739

DECOMPRESSIVE CRANIECTOMY AS A TREATMENT OPTION OF INTRACRANIAL PRESSURE IN MENINGOENCEPHALITIS: EXPERIENCE OF TWO PEDIATRIC CASES

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Encephalitis is a very serious illness, with a significant risk of morbidity and mortality worldwide, because of an often associated focal necrosis and edema that can give rise to space-occupying lesions and high intracranial pressure (ICP). When progressive raising of ICP, not responding to medical therapy, is observed, death is a common occurrence. In 18 month period two patients effected by acute meningoencephalitis of unknown causation were treated with decompressive craniectomi at the Department of Neurosurgery of the Ege University. Because of the development of intracranial hypertension refractory to medical treatment, decompressive craniectomy (DC) was performed. Despite acyclovir therapy, our first patient's clinical condition deteriorated following a period of clinical stability, necessitating decompressive surgery on the 13th day of the clinical course. Our second patient was interesting because of ICP peak was in first 3 days. The first patient had muscle bilateral weakness but more in the right side and became physiotherapy program. A neuropsychologic evaluation indicated mild menatl retardation, behavioral problems and cognitive disorders at 12 months. The second patient recovered uneventfully and three weeks later, findings on neurological examination were only mild facial paralisia and muscle weakness in left side. The second patient did not have any detectable neurologic deficite. Case reports and small anecdotal series have shown that DC can be a lifesaving method to prevent uncal herniation following severe encephalitis

ESPID-0740

SYNERGISTIC EFFECT OF XANTHONE ANALOGS IN COMBINATION WITH AMPICILLIN AGAINST PATHOGENIC LEPTOSPIRES

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Background: Leptospirosis, a spirochaetal zoonotic disease, has been recognized as an important emerging infectious disease that had been reported in children.

Aims: Eight xanthone analogs were examined for their inhibitory activities and synergistic effect.

Methods: Minimal inhibitory concentrations (MIC) of xanthones analogs were examined for inhibition growth of pathogenic (*L. interrogans* serovar Autumnalis, Bataviae, Javanica and Saigon) and non- pathogenic (*L. biflexa* serovar Patoc) leptospires by using broth microdilution technique and alamar blue. The synergy was evaluated by calculating the fractional inhibitory concentration (FIC) index.

Results: The results showed that xathone analogs were active against pathogenic and non- pathogenic leptospira with MICs ranging from 50 to ≥ 800 µg/ml. Among them, 1,3,8-trihydroxyxanthone and 1,3-dihydroxythioxanthone were the most active compounds against both of pathogenic (MIC ranged 100-200 µg/ml) and non-pathogenic leptospira (MIC = 100 µg/ml). However, these MIC values were higher than those of traditional antibiotics. Combinations of 1,3,8-trihydroxyxanthone with ampicillin generated partial synergy against pathogenic and non-pathogenic leptospira (FIC ranged 0.51 to 0.75).

Conclusions: The xathone analogs with significant antibacterial activity may be used to control leptospirosis. The combination of xanthone analog with antibiotic enhances the antileptospiral efficacy.

ESPID-0741

EVALUATION OF VIRAL RESISTANCE AND COMPLIANCE TO COMBINED ANTIRETROVIRAL THERAPY INCLUDING LOPINAVIR/RITONAVIR IN PATIENTS WHO START TREATMENT IN THEIR CHILDHOOD

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Introduction: Constanta is one of the most affected counties by HIV from Romania, in young adults infected since their childhood.

Objective: To evaluate efficacy versus virologic failure by resistance to Lopinavir/ritonavir (LPV/r) containing regimens in young adults treated since their childhood.

Material and method: We analyzed demographic data, length of HIV infection and length of LPV/r exposure, and also CD4 count, and viral load. Drug resistance genotyping was performed using 3 different methods: Celera Diagnostics, ViroSeq™ HIV-1 and TruGene HIV-1.

Results: From a total of 295 patients' children and adolescents who received treatment with LPV/r for a period of 6.2 years (range: 1-11) we suspected 82 patients (68.75%) for viral resistance. 42 patients (51.21%) presented resistance strains to LPV/r (which were considered compliant), and 40 patients (48.78%) were without resistance mutation (uncompliant patients). Median age in the moment of starting Lopinavir/ritonavir based regimen was 13.5 years (yrs.) in compliant patients and 14.11 yrs. in uncompliant patients, and in the moment of resistance were 20.38 yrs., and respectively 20.97 yrs. For patients with viral resistance median CD4 count was 316.95 cells/mmc, and median viral load was 75957.31 copies/ml (4.4 Log_{10}). Most common major mutation to LPV/r was V82A, in 34 patients; most frequent minor mutations were L10I/V/F/R and L24I/F in 37 and respectively 24 patients. 34 patients presented high level resistance to LPV/r, and 8 patients presented intermediated resistance.

Conclusions: Highly resistant strains to LPV/r in compliant patients were in 41.46%, and 48.78% uncompliant patients' harbored viruses without any resistance mutations.

ESPID-0742

CAUSES OF C-REACTIVE PROTEIN >100 MG/L IN NEONATES AT A CHILDREN'S HOSPITAL.

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Background and aims

C-reactive protein (CRP) is an acute phase reactant commonly measured in children in hospital. A CRP > 100 mg/l is thought to be unusual in neonates and is suggestive of a serious inflammatory process. Little work has been done to determine the causes and the outcome of neonates with such a high CRP.

Methods

A retrospective audit of all neonates with CRP >100 mg/L admitted to a children's hospital over a 5 year period (2007-11).

Results

241 neonates had 781 CRPs >100 mg/L during the study period. The commonest causes were; Infection (98 neonates – 49 community acquired), after Cardiac or abdominal surgery (n=81), enterocolitis/ intestinal perforation (n=38). All except 5 neonates were given empirical antibiotics when the CRP was >100 mg/l – a cephalosporin +/- a penicillin in 184 neonates. 30 neonates grew pathogens resistant to cefotaxime and amoxicillin (4 community acquired, 26 Healthcare Associated). Antimicrobials were changed for 51 infants depending on culture results or clinical response. Antibiotics were given for a median of 7 days (range 1-40). 41 neonates (17%) died – 26 during that admission, 15 later.

Conclusions

Neonates with a CRP > 100 mg/l have a high risk of infection and 17% mortality. Most neonates with community acquired infection and CRP >100 mg/l will be adequately treated with cefotaxime and amoxicillin, most neonates with healthcare associated infection and CRP >100 mg/l will NOT be adequately treated with this regimen. Further work is needed to differentiate when CRP is raised because of surgery or infection.

ESPID-0743

TREATMENT EFFECT OF CLARITHROMYCIN ON SCRUB TYPHUS IN CHILDREN

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Introduction: While clarithromycin have recently been used for the treatment of scrub typhus in adults, there has been no report on its effect in the paediatric patients.

Objectives and Aims: We evaluated the effect of clarithromycin on scrub typhus in children.

Methods: We retrospectively analyzed medical records of 56 children with scrub typhus who were admitted from 2004 through 2013 at Chonbuk National University Hospital, Jeonju, Korea. They were divided into chloramphenicol-treated group (CM group), azithromycin-treated group (AZ group), and clarithromycin-treated group (CL group). We compared the clinical findings among CM group (n=19), AZ group (n=25), and CL group (n=12).

Results: Most were diagnosed during October (46%) to November (48%). All patients showed fever and rash. Common clinical manifestations were an eschar (71%), lymphadenopathy (48%), upper respiratory symptoms (42%), headache (30%), and hepatosplenomegaly (14%). Elevated levels of CRP, ESR, AST, and ALT were detected in 95%, 96%, 83%, and 77% of the patients. In addition, decreased levels of platelets and WBCs were seen in 43% and 41% of the patients. There were no statistical difference among the groups in clinical manifestations including time for defervescence after treatment (P = 0.0848): 1.3 ± 1.3 days in CM group, 1.8 ± 0.8 days in AZ group, and 1.1 ± 0.9 days in CL group. All patients recovered without complications related to the disease or the drugs.

Conclusions: Clarithromycin was effective as chloramphenicol or azithromycin in paediatric scrub typhus and may be used as a first line treatment drug.

ESPID-0744

ANTIMICROBIAL ACTIVITY OF SELECTED NATURAL COMPOUNDS AGAINST MULTI-RESISTANT PATHOGENS

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Background and aims

The increasing number of microorganisms resistant to antimicrobial agents has been global challenge due to the high selective antibiotic pressure. Multi-resistant pathogens such as *Staphylococcus aureus*, *Enterococcus faecium*, *Pseudomonas aeruginosa* and *Klebsiella pneumoniae* may cause serious disorders of children including skin infections. One of possible approaches for skin infections treatment is to exploit antimicrobial properties of natural compounds instead of antibiotics. Aim of this study was to evaluate an antimicrobial activity of selected natural compounds against *Staphylococcus aureus*, *Enterococcus faecium*, *Pseudomonas aeruginosa* and *Klebsiella pneumoniae* strains.

Methods

Antimicrobial properties of natural substances including thymol, carvacrol, eugenol, gallic acid, alfa-pinen, beta-pinen and usnic acid against tested microorganisms were determined as minimum inhibitory concentration (MIC) using a microdilution method. The MIC value was defined as the lowest concentration of natural compound in which the growth of microorganisms was inhibited.

Results

We found usnic acid to be the most effective against gram-positive bacteria. MIC values were in range 4.7-18.8 mg/l. However, thymol and carvacrol were substances with broad spectrum of efficacy against all tested microorganisms; MIC values were in range 300-600 mg/l and 150-1200 mg/l, respectively. Gallic acid was the most efficient against *Pseudomonas aeruginosa* strains; MIC values were in range 150-300 mg/l.

Conclusions

Our results revealed natural compounds to possess broad spectrum of activity against examined microorganisms. The present study describes antimicrobial properties of selected natural compounds and points out their possible involvement in the therapy of skin infections.

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ESPID-0745

SAFETY AND TOLERABILITY OF MENINGOCOCCAL GROUP C CONJUGATE VACCINE IN TUSCANY FROM 2005 TO 2012

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BACKGROUND AND AIMS: The previously increasing trend of serogroup C meningococcal disease in Italy dramatically declined after the introduction of a universal vaccination programme against Neisseria meningitidis serogroup C. In Tuscany, in 2005, a policy of active offer of conjugate meningococcal C (MCC) vaccination with three doses to all newborns at 3, 5 and 13 months of age and a catch-up until 6 years with a single dose was approved. The newborn schedule turned, in 2008, to a single dose at 13 months. The aim of our study was to evaluate the safety of MCC vaccine in Tuscany.

METHODS: Adverse reactions (AR) to MCC vaccine notified by the 12 local health units from 2005 to 2012 (classified as not severe; severe requiring hospitalization but followed by resolution; very severe, possibly with long-term consequences) were collected and analysed using the Microsoft Excel Programme 2010.

RESULTS: Following the administration of 451.570 doses, 110 AR were notified. The average annual reporting rate was 2,8/10.000 doses. The most frequently reported AR proved to be fever (60%), followed by febrile seizures (13,6%) and swelling at the injection site (11%). Overall, 77,3% were not severe, 22% required hospitalization, one (1%) was reported as a pervasive developmental disorder developed almost four month after the vaccination. Most (80,9%) happened after co-administration with other vaccines/drugs.

CONCLUSIONS: AR proved to be rare. The only severe disability reported cannot be put in correlation with MMC vaccination due to the lack of biological plausibility. All other AR had only temporary consequences.

ESPID-0746

ALTERED CYTOKINE/CHEMOKINE RESPONSES TO MITOGEN RESPONSIBLE FOR INDETERMINATE QUANTIFERON RESULTS IN IMMUNOCOMPETENT CHILDREN ONGOING ACUTE INFECTION

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Introduction: Indeterminate results (i.e. negativity of IFNg-response to mitogen used as positive control in Interferon-g release assay) represent a limitation to diagnose Mycobacterium tuberculosis (M.tb) infection (TB) in young children.

We recently reported that ongoing acute infection, common in young immunocompetent children, is associated with Quantiferon indeterminate results.

Objectives,aims: highlight the mechanism(s) involved.

Methods: Levels of Th1 (IL2, IFNg, TNFa), Th2 (IL4, IL5, IL13), Th17 (IL-17), regulatory (IL10) cytokines and of the IP-10 chemokine were measured in Quantiferon residual plasma from 23 immunocompetent children (Median age: 4.0y). Fifteen children with determinate results and either with M.tb infection (Active-TB n= 3, Latent-TB n= 4, Median age: 4y) or uninfected following contact n=8 (median age: 3.42y) were included as controls. Results from controls were compared with results from 8 children (Median age: 3.78y) with indeterminate results (i.e. results <0.50 in the mitogen tube) and acute common infection.

A multiplexed microsphere-based assay was used for cytokine/chemokine measurement.

Results: As expected, M.tb antigens induced Th1 and Th2 cytokines selectively in M.tb-infected children. Significant induction by mitogen of Th1, Th2, Th17 and IL10 cytokines in the determinate group contrasted with significant induction of the only IL10 cytokine in the indeterminate group.

Furthermore, IL10/IL2, IL-10/IL13, IL10/TNFa, IL10/IP-10 and IL10/IL5 ratios in the mitogen tube were higher (p from 0.04 to 0.0001) in the indeterminate group.

Conclusions: IL10 over-expression likely represents one regulatory mechanism responsible for indeterminate Quantiferon results in young children with common acute infection unrelated to M.tb.

ESPID-0748

DISEASE BURDEN OF ROTAVIRUS GASTROENTERITIS IN CHILDREN IN GERMANY

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Introduction/Objective: Representative popular-based data on the epidemiology of acute gastroenteritis (AGE) due to Rotavirus (RV) are rare. The rationale of this study is to provide robust information on the epidemiology and health economic that characterize RV disease burden in Germany today, establishing a valuable baseline for the future assessment of RV vaccination impact.

Aims/Methods: Data which are mandatory reported for any hospitalization including ICD-10- and Diagnosis related group (DRG)-Code for AGE, gender and direct costs was extracted from DESTATIS (German Federal Statistics Office) for children aged < 10 years for the period 2005-2010. Crude rates (CR) and age-standardized rates (AR) per 100,000 person-years (PY) were calculated. Poisson regression was used to estimate rate ratios of seasonal effects and immunisation recommendations adjusted for year, federal state and age where appropriate.

Results: From the 100 million hospitalizations regarded in this study a total of 5,843,730 children aged 0 to 10 have been hospitalized, 520,606 due to an AGE. 152,638 cases of an AGE cause by RV with an AR of 302 hospitalizations per 100,000 PY have been identified causing average annual direct costs of 42 million €. CR were fairly similar by sex, but decreased with age. Rates were similar for both genders, but differ by federal state, year and season.

Conclusion: In conclusion, direct health care costs were high for children between age 0 and 10 with inpatient treatment of AGERV. RV disease constitutes a large public health burden in Germany.

ESPID-0750

ARTERIAL ISCHEMIC STROKE AS A RARE EARLY COMPLICATION OF VARICELLA IN CHILDREN

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Introduction: Post varicella arterial ischemic stroke (AIS) is rare and usually a late complication, although it has been reported within the first week of illness. The anterior cerebral circulation and the basal ganglia are commonly affected.

Case report: 3 year-old boy, with β-thalassemia major submitted to bone marrow allotransplant in the previous year and under cyclosporine treatment. Admitted for acute right hemiparesis, right upper-limb dystonia and hyperreflexia at day 2 of varicella. Cranial MRI showed a basal ganglia infarction in the territory of the perforating branches of the middle cerebral artery with no arterial stenosis. PCR for varicella-zoster virus (VZV) was positive in the cerebrospinal fluid. Treatment with intravenous acyclovir was established for 21 days. Transcranial and cervical doppler and cardiologic evaluation were normal. The pro-thrombotic study revealed a transient antiphospholipid syndrome. Concomitant treatment with a platelet aggregation inhibitor (dipyridamole) was initiated. At 6 months follow-up a residual right hemiparesis was still present.

Conclusions: In immunocompromised patients with VZV vasculopathy, the gap between rash and neurological signs may be smaller with positive VZV-DNA in cerebrospinal fluid. Prior to transplant anti-VZV immunization would have been beneficial. The transient antiphospholipid syndrome was probably due to the underlying infection and did not represent a pro-thrombotic risk factor. The signs of acute infarction of the basal ganglia (hypertonia, hyperreflexia and dystonia) may difficult the diagnosis, as they are typically late manifestations of other cerebral areas infarction; therefore obtaining history of recent varicella is important.

ESPID-0752

PROSPECTIVE EDUCATIONAL INTERVENTION ON PARENTS' ATTITUDE TO VARICELLA-ZOSTER VIRUS VACCINE IN JAPAN

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Background and aims: As result of the low varicella-zoster virus (VZV) vaccine's coverage, annual estimates of varicella cases are 0.8 - 1 million in Japan. The VZV vaccine is not funded by our national vaccine program that it costs 60 euro per dose for parents. Besides the cost barrier, previous studies found that lack of parents' understanding for varicella was also associated with low vaccine's rate. We evaluated whether parents would give VZV vaccine to unimmunized children through education provided by physicians.

Methods: A prospective study was conducted for hospitalized children at our children's hospital in Japan. Immunocompromized children and infants were excluded. Structured educational intervention was provided by physicians to encourage VZV immunization to parents of children who were non-immune to VZV. Their willingness of giving VZV immunization was surveyed before hospital discharge. Three months later, VZV immunization status was interviewed by telephone.

Results: Median age of child was 3.7 year-old. Ninety four parents were eligible for the study. Seventy five (79%) parents received educational intervention during hospitalization. Among them, 67 (92%) parents had willingness to give VZV immunization at discharge. After 3 months, only 24 (37%) parents actually had their children vaccinated. Expense for VZV vaccine and time required for visiting clinic were major reasons not to immunize their children.

Conclusion: Educational approach had little impact on VZV immunization for hospitalized children. Removing cost barrier by public funding may improve VZV vaccine coverage.

ESPID-0753

INVASIVE GROUP A STREPTOCOCCAL INFECTION AMONG CHILDREN IN TWO UNIVERSITY HOSPITALS IN KOREA FROM 1992 TO 2013

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Background and aims: Group A streptococcus (GAS) accounts for a wide spectrum of diseases including pharyngitis, cellulitis and is an important cause of invasive diseases in children. We aimed to describe the clinical characteristics of invasive GAS infections in children in Korea.

Methods: A retrospective study of children under 18 years of age with invasive GAS infections admitted to Seoul National University Children's Hospital between March 1992 and October 2013, and Seoul National University Bundang Hospital between Mar 2003 and October 2013 was conducted. Demographic factors, clinical characteristics, laboratory findings, treatment, mortality and morbidity were reviewed.

Results: A total of 30 among 36 cases identified as invasive GAS disease were available for review. There was a predominance for male subjects (male: female = 2.75:1). The median age was 4 years 2 months (range 12 days to 15 years) and 53.3% were under 5 years of age. Skin and soft tissue infections (8/30, 26.7%), bacteremia without identified focus (6/30, 20%) and bone and joint infections (6/30, 20%) were the most frequent clinical presentations. Streptococcal toxic shock syndrome (3/30, 10%) and pulmonary, abdomen and central nervous system infections were also seen. There was a peak in year 2012 (9/30, 30%). There were no cases of mortality. Erythromycin and clindamycin resistance rates were low by 3.3% and 6.7%, respectively.

Conclusions: GAS is an important cause of invasive disease in Korean children especially in those under 5 years of age. Early recognition and prompt adequate antibiotic therapy is important in reducing morbidity and mortality.

ESPID-0754

MOLECULAR CHARACTERIZATION OF LISTERIA MONOCYTOGENES ISOLATES FROM PREGNANCY-RELATED CASES IN NORTHERN ITALY

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Background and aims

Invasive listeriosis usually affects pregnant, newborns, the elderly, and immunocompromised individuals. In pregnant women *Listeria monocytogenes* may cause abortion, fetal death, or neonatal morbidity. The aim of this study was to characterize pregnancy-related isolates of *L.monocytogenes* observed in Lombardy, Italy, from 2005 to 2012.

Methods

Intragenic regions of six virulence and seven housekeeping genes of 19 pregnancy-related isolates were amplified and analyzed. Virulence gene sequences were compared to major human listeriosis outbreaks worldwide. Housekeeping alleles and STs were assigned by the Pasteur Institute, France.

Results

On the whole, 15 VTs and 14 STs were identified. Based on the MVLST results 37% of isolates belonged to one the seven currently known ECs of *L. monocytogenes*. Interestingly, two ECI isolates (VT20) corresponded to ST1 and ST595 both included in the same Clonal Complex (CC)1 which includes also VT87 (ST1). A similar picture was recorded for CC101 which included ST38 and ST101 that have been typed as VT80 and 100, respectively, presenting just a SNP for both the typing protocols. Eight isolates proved to belong to previously observed VTs-STs (Table 1).

Table 1. Description of the 19 *L. monocytogenes* isolates from pregnancy-related cases analyzed in the current study.

ID	Serotype	Year	MLST ST	MLST CC	MVLST VT	VT was previously observed in
5	4b	2005	1	1	VT20	ECI
13	4b	2006	4		VT76	Animal encephalitis (Rocha et al., 2013)
19	1/2a	2007	8		VT59	ECV
38	4b	2007	4		VT76	Animal encephalitis (Rocha et al., 2013)
63	1/2a	2008	29		VT74	2011 US cantaloupe outbreak (Lomonaco et al., 2013)
67	1/2a	2008	7		VT59	ECV
108	1/2a	2009	36		VT75	Animal encephalitis (Rocha et al., 2013)
131	4b	2010	6		VT102	newly assigned VT
141	1/2a	2010	38	101	VT80	2012 Ricotta salata outbreak
143	4b	2010	2		VT21	ECIV
144	1/2b	2010	560		VT101	newly assigned VT
146	4b	2010	520		VT103	newly assigned VT
149	4b	2010	6		VT19	ECII
150	4b	2010	1	1	VT87	na
171	1/2a	2011	38	101	VT100	newly assigned VT
202	4b	2011	595	1	VT20	ECI
206	4b	2012	2		VT21	ECIV
207	1/2a	2012	101	101	VT80	2012 Ricotta salata outbreak
208	1/2a	2012	155		VT45	various sources (Chen et al., 2007; Knabel et al., 2012)

Conclusions

Typing of *L. monocytogenes* isolates analyzed herein from apparently sporadic pregnancy-related cases of listeriosis showed a possible relation between them. Such data will be important to better determine how ECs are distributed and trace their long-term spread.

ESPID-0755

LICENCE TO VACCINATE – ROKOKO-PROJECT PROVIDES NATIONWIDE TRAINING MODULE OF VACCINATION COMPETENCE FOR NURSES THAT WILL BE USED BY ALL UNIVERSITIES OF APPLIED SCIENCES IN FINLAND

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Background: Nurses give almost all vaccinations in Finland. They have a central role in counseling population on vaccine preventable diseases and vaccinations. Public health nurses at Health Centers, Child Welfare Clinics and School Health Care are in a key role carrying out the National Immunization Program, NIP. Physicians play a consulting role. Nurses are educated by 25 Universities of Applied Sciences.

The NIP vaccination coverage of children ≤ 2 years has been excellent: 93-99% depending on birth year and vaccine, seasonal-influenza vaccination coverage (children 6-35 months) has been only 13-34%. Pandemrix-vaccine related narcolepsy cases have raised questions about vaccination safety. Antivaccine sentiments are more visible. The need of all NIP vaccinations is questioned, especially new vaccines (influenza-, rotavirus- and pneumococcal-vaccines).

Aims: The Aim of the ROKOKO -project is to develop a nationwide, high level training module (length of 3 ECTS) of vaccination competence for nurses.

Methods: Ministry of Social Affairs and Health has granted funding to Helsinki Metropolia University of Applied Sciences for ROKOKO-project. Project is done with Turku and Diaconia University of Applied Sciences and National Institute for Health and Welfare. Learning will be mainly virtual. Teaching contains video lectures, laboratory training, simulations and case studies.

Results: The project provides homogenous, national training module (both in Finnish and Swedish) for all universities and testing the knowledge of nurses. The training module will be in use 2015.

Conclusions: The project promotes Health Care Professionals, HP´s positive attitude toward vaccinations, helps to maintain trust in NIP and supports high vaccination coverage.

ESPID-0757

PAEDIATRIC PARAPNEUMONIC EMPYEMA (PPE) IN GERMANY 2010-2013 – MICROBIOLOGICAL RESULTS FROM 666 CHILDREN

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Introduction

An increase in the incidence of PPE has been observed in several countries. We aim to determine incidence, etiology, complications, treatment and influence of pneumococcal conjugate vaccines (PCVs) in children with PPE in Germany.

Methods

Between October 2010 and June 2013 nationwide hospital-based PPE surveillance has been conducted using the German Surveillance System for Rare Paediatric Diseases (ESPED). Children <18 years of age with diagnosis of pneumonia accompanied by pleural effusion persisting for ≥7 days or necessitating pleural drainage were included. Molecular pathogen detection from pleural fluid by broad-spectrum eubacterial 16S-rDNA PCR and pneumococcal serotyping was offered.

Results

This analyse includes 666 patients (49% males) aged 5.0 years (median, IQR 3.3-9.6). From 620 (93%) children 533 blood cultures, 288 pleural fluid cultures and 174 PCRs were taken; 253 of these 995 microbiological analyses (25%) were positive. Pathogens were detected in 224 of 620 children (36%). *Streptococcus pneumoniae (SPN)* was detected in 109 (18%), *Streptococcus pyogenes* in 24 (4%) and *Staphylococcus epidermidis* in 11 (2%) of all PPE-children. In 35 PPE-children a total of 36 SPN-Serotypes (ST) have been identified: ST 1 (n=17/47%); ST 3 (8/22%); ST 7F (5/14%); ST 19A (4/11%); ST 18C (1/3%); ST 19F (1/3%). Of 109 PPE-children with SPN-infections 61 (56%) had received PCV.

Discussion

PCR of pleural fluid increased the overall bacterial detection rate from 26% to 32%. *SPN* was the most frequently identified pathogen in PPE-children. Theoretical coverage of SPN-PPE with known ST was 6% for PCV7, 67% for PCV10 and 100% for PCV13.

ESPID-0758

MALIGNANCIES AMONG HIV-INFECTED CHILDREN IN UKRAINE

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Background and Aims:
The risk of malignancy development in HIV positive people is higher than among the general population. We aimed to determine the frequency of oncologic diseases among 502 HIV-infected children treated at the Infectious Diseases Center for HIV - positive Children at Kyiv, Ukraine.
Methods:
Among 502 HIV-infected patients treated in our center between April 2008 and April 2013, a retrospective analysis was performed on 15 cases of diagnosed malignancy.
Results:
The total number of HIV positive children with cancer was 15 during the selected time period. The average age of children was 7.5 years, 27% were female and 73% was male. The most common malignacy was non-Hodgkin's lymphoma -47%. Number of Hodgkin's lymphoma cases was 33%, 7% Kaposi Sarcoma was observed in our cohort and 13% of other malignancy cases were unspecified. Severe immune suppression at the time of malignancy diagnosis was detected in 72% patients with non-Hodgkin's lymphoma, and 60% in the cohort with Hodgkin's lymphoma. Of all the children who developed cancer, 40% were on HAART, but only 13% had a high level of adherence.
Tuberculosis (TB) was a very common co-morbidity and 60% of patients with cancer also received treatment for TB. Toatal mortality was 60%, in group with non-Hodgkin's lymphoma-100%.
Conclusions:
- Non-Hodgkin's lymphoma is the most agressive and common cancer among HIV positive children in our clinic.
- Severe immune suppression, poor adherences are predictors for the development of malignancy among HIV-infected children.
- HIV/TB coinfection complicates the management of malignancy cases and worsens prognosis.

ESPID-0759

TINN2: TREAT INFECTION IN NEONATES 2 AZITHROMYCIN FOR THE PREVENTION OF BRONCHOPULMONARY DYSPLASIA IN PRETERM NEONATES

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Background: In neonates, pulmonary Ureaplasma colonization, and inflammation may play a role in BPD development, a multifactorial disease of prematurity. The macrolide antibiotic azithromycin may be effective in reducing the severity of BPD as being active against Ureaplasma and presenting anti-inflammatory properties.

Objectives and Clinical trial design: The TINN2-project (www.tinn2-project.org) was submitted and financed by the FP7 program in order to evaluate azithromycin in neonates and obtain a PUMA with the TINN2 Pediatric Investigation Plan approved by the PedCo in January 2013.

This randomised, double-bind, placebo-controlled trial was designed to assess the efficacy of azithromycin in increasing the rate of survival without BPD in 810 preterm infants of ≤28weeks gestation ventilated within 48hours of birth treated with 10mg/kg/days for 10days.

Among the main secondary objectives TINN2 will assess changes in the overall neonatal mortality rate, safety and pharmacokinetics of azithromycin, pulmonary colonisation by *Ureaplasma*, and Ureaplasma resistance to treatment.

Recent advances in TINN2 include the initiation of the Voluntary Harmonization Procedure in early 2014, validation of TINN2 procedures and stopping rules by the Independent Safety Monitoring Board, selection of TINN2 participating centers and design of the e-CRF.

Expected outcomes, potential implications: TINN2 will provide the required information on the pharmacokinetics, efficacy and safety, of azithromycin in the newborn to apply for a PUMA. TINN2 currently benefits from various paediatric drug evaluation initiatives across Europe, including the ongoing TINN1-project consolidating a network of units with experience in clinical research that will be used for additional drug evaluation in neonates.

ESPID-0760

NEUROLOGICAL COMPLICATIONS OF NOVEL INFLUENZA A (H1N1) INFECTION OBSERVED IN PEDIATRIC INTENSIVE CARE UNIT

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Introduction and objectives: Neurological complications are well-described in patients with influenza A virus (H1N1) infection, especially in pediatric cases. We reported seven children of influenza A infection presenting severe neurological symptoms in our pediatric intensive care unit (PICU).

Methods: From August 2009 to January 2011, seven pediatric patients with influenza virus infection had been admitted in our PICU resulting from altered consciousness or seizures. Detailed clinical descriptions and laboratory assessment were recorded. All nasopharyngeal swab specimens were confirmed as novel H1N1 strain by real-time Polymerase Chain Reaction (PCR). Electroencephalogram, neuroimaging, and cerebrospinal fluid (CSF) were analyzed.

Results: Of seven patients with influenza A virus (H1N1) infection, three patients presented with altered consciousness and four had prolonged seizures. More than half of the cases developed neurological complications within the first 24 hours of the disease course. CSF pleocytosis was found in one patient. Electroencephalogram showed theta bursts or diffuse voltage suppression in five patients. Neuroimaging showed cerebral edema in only one patient and developed comatose since the admission day and expired after four months of hospitalization, resulting in septicemia. Five patient had good clinical outcomes without neurological sequelae and one patient developed epilepsy and treated with long-term anticonvulsants.

Conclusions: Rapid progression of neurological complications was found in our patients. Most patients with neurological complications had favorable prognosis. CSF analysis and neuroimaging may show normal during early course of the disease. The clinical symptoms of increased intracranial pressure and abnormal finding on neuroimaging may lead to poor outcomes.

ESPID-0761

PHYLOGENETIC RELATIONSHIPS AMONG GREEK, EUROPEAN AND CURRENT ROTAVIRUS VACCINE STRAINS

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Background: Rotavirus group A (RVA) is the main cause of acute gastroenteritis (AG) among children ≤5 years old. In 2006 and 2007, the live-attenuated rotavirus vaccines, Rotarix™(G1P[8]) and RotaTeq® (G1-G4, P[8]) respectively, were introduced in Greece. The present study assesses the phylogenetic relationships between circulating strains in Greece during 2008-2012 with European and vaccine strains.

Methods: Eighty stool samples from children (≤ 5 years old) with rotavirus AG, were collected and genotyped on the basis of the outer capsid proteins VP7 and VP4 and specifically for G1-G4, P[8] genotypes. Partial sequences were obtained using ABI Genetic Analyzer-3500. Accession numbers of European and vaccine strains were obtained from GenBank. Alignment of nucleotide and deduced amino acid sequences, as well as identity matrices, were calculated in BioEdit. Phylogenetic analyses were completed using the Neighbor Joining statistical method and the Bootstrap algorithm (1000 replications) of MEGA v5.05.

Results: Greek isolates appeared generally clustered together with other European strains but partially differentiated from the vaccine strains. On the amino acid level, analyses showed overall identities of 92-94% for G1, 87-93% for G2, 89-96% for G3, 88-95% for G4 and 88-93% for P[8] between Greek RVA and vaccine strains, as opposed to 97-100%, 95-100%, 92-98%, 92-99%, and 91-100% identities respectively, between Greek and other European RVA strains; the identity for P[4] was 95-99%.

Conclusions: Considering the Rotavirus tendency to reassortment, which may pose a threat to vaccine efficacy in the future, continuous monitoring of its molecular epidemiology and evolution is necessary.

ESPID-0762

ARE POST TREATMENT CHEST X-RAYS USEFUL AFTER LATENT TB?

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Background and aims:

There is wide variation in practice in the treatment of latent TB (LTBI), including whether or not to perform a repeat chest radiograph (CXR) at the end of treatment. The aim of this audit was to assess the usefulness of such CXRs

Method:

We conducted a retrospective review of all children treated for LTBI at Birmingham Chest Clinic during 2011-12 . Children were identified through the hospital TB database. We collected information from clinic letters and radiology reports.

Results:

Of 211 children identified, 21 were excluded because they had received primary prophylaxis as infant contacts of TB rather than having LTBI and 11 had incomplete clinical information.

Of 179 remaining children, 41 did not have post-treatment chest x-rays, largely due to being lost to follow up.

6 out of 138 (4%) post-treatment CXRs showed a reported abnormality: None of the abnormalities were present on the pre-treatment CXR. 2 had prominent hila; 3 had some basal opacification; 1 revealed minor scarring in the right upper lobe. No children needed a change in management as a result of the reported CXR changes.

Conclusions:

In our cohort of children who received treatment for LTBI, performing a post treatment chest x-ray did not result in a change in management. We suggest that repeat CXRs after completing LTBI treatment are not indicated in the absence of suggestive symptoms.

ESPID-0763

LONG LINE RELATED BLOODSTREAM INFECTIONS IN NEONATAL INTENSIVE CARE UNITS

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INTRODUCTION: Linerelated sepsis is probably the commonestserious complication of long lines. The incidence of line related sepsisappears to be 4–12 per 1000 catheter. risk is increased by longer duration of catheterization,and is influenced by catheter material, frequency of line breaks , multiplelumens, and by technique of catheter fixation. Line sepsis is frequentlyaccompanied by thrombus formation. The rate of infection may be reduced by staff education. Incorporationin long lines with heparin, silver, orother substances with antimicrobial qualities has shown promising results in adult studies, but has not beeninvestigated in the neonates

OBJECTIVE : Our objective is to see the long line-associated bloodstreaminfections which increases the morbidity and adverse outcomes in multiple systems in the neonatal intensive careunit.

METHODS : Culture results from the tip of the long line inserted fromNovember 2007 to October 2012 in university hospital limerick from neonatal data base ,HIPESearch,Microbiology Lab data,Canvasing from the Neonatologist,chart reviews.

RESULTS: Culture results from the tip of the long line inserted during thestudy period in university maternity hospital limerick and there were 515 long line tips received from273 patients.116 Female (42%), 157 male (58%), mean age at first tip culture: 8days, median 7 days, range 0 – 46 days.Average number of tips per patient =1.9, median = 2, range 1 -5. And the culture result are 269(52%) has no growth,116(23%) mixed Skin flora,72(14%) Coagulase Negative Staphylocous CoNS)$<10^5$, 26 (5%) has CoNS> 10^5,7(1%) Enterococus fecalis&CoNS, 6(1%)Scanty commensal, 5(1%) candida&CoNS, 5(1%) Methicillin Sensitive S. Aureus (MSSA).

Only 20 patients from longline culture " yielded significant" isolates from blood cultures also.

CONCLUSION: Long line provide secure vascularaccess in newborn infants, but are associated with many serious complication.Linerelated sepsis, the commonest of these, may be minimised by using polyurethaneor silicone long lines, minimising line breaks, using single rather thanmultiple lumen lines, shortening duration of use, staff education and using ofIV vancomycin immediately after inserting a long line.

ESPID-0764

PUBLIC ANTIBODY REPERTOIRE ANALYSIS OF HIGH-THROUGHPUT SEQUENCE DATA FROM PERIPHERAL BLOOD IDENTIFIES ANTIGEN-SPECIFIC B CELL RECEPTOR SEQUENCES

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Background Nearly all licensed vaccines confer protection by stimulating the production of pathogen-specific antibodies. High-throughput sequencing of the antibody repertoire could be used to assess vaccine immunogenicity and yield new insights into B-cell biology. A number of antigen-specific B-cell receptor (BCR) sequences have previously been reported for *Haemophilus influenzae* type b (Hib) polysaccharide and tetanus toxoid (TT).

Methods Five adults received a Hib-MenC-TT vaccine. B-cells were isolated before and 7 days post-vaccination. Antibody sequences were amplified by RT-PCR, submitted for 454 pyrosequencing and analysed by IMGT/HighV-QUEST. Anti-PRP IgG concentration and avidity were determined 28 days after immunisation.

Results In total 29 samples were sequenced, yielding 184,844 productive reads. Analysis of identical post-vaccination CDR3 AA sequences shared by ≥2 individuals identified several known Hib-specific antibody sequences but only one previously described TT sequence. The extension of this analysis to highly similar CDR3 AA sequences identified a number of other TT sequences. The proposed antigen-specific BCR sequences were investigated for VJ usage, frequency of V gene mutations and isotype subclass information. The anti-Hib avidity index 1 month after vaccination was strongly correlated with the relative frequency of Hib-specific sequences indicating that the public post-vaccination antibody repertoire may be related to antibody immunogenicity.

Conclusion Analysis of public BCR repertoire in this dataset provided evidence of convergent BCR evolution in individuals exposed to the same antigen. If this finding is confirmed the public repertoire could be used for rapid and direct identification of antigen-specific antibody sequences from bulk-sorted cells or even whole blood.

ESPID-0765

DOUBLE DOSING OF RITONAVIR IN TWICE-DAILY DARUNAVIR-CONTAINING REGIMENS: AN EXAMPLE OF A LACK OF APPROPRIATE FORMULATIONS IN PAEDIATRICS

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Background and aims. Ritonavir-boosted darunavir (DRV/RTV) is licensed in Europe for 3-<18 year olds, although little is known about post-licensing safety, or how RTV is co-prescribed. We assessed the safety of DRV/RTV in 8 paediatric cohorts in Europe.

Methods. Retrospective analysis of individual data for children <18 years receiving DRV/RTV to 31/12/12. DAIDS gradings characterised severity of clinical and laboratory (TC, TG, AST, BIL) adverse events (AEs).

Results. 239 children took DRV/RTV: 82 the b.i.d. dose, 85 q.d., the rest other doses. 85% (44/52; 30 missing) on DRV b.i.d. took 200mg RTV daily, whilst 99% (69/70; 15 missing) on DRV q.d. took 100mg (table).

26% (21/82) stopped DRV b.i.d during follow-up, mainly for patient-related reasons (11), but also treatment failure (4) and AEs (6). Additionally 5 clinical AEs were causally related to DRV b.i.d.: 3 (2 hypercholesterolemia, 1 hypersensitivity) were considered serious and DRV was stopped.

11(13%) stopped DRV q.d., including for patient compliance (4), treatment simplification (3) and other non-efficacy reasons (4). Grade 1/2 hypercholesterolemia rates were raised for both groups (eg grade 1 44/100py (95%CI 32-59) b.i.d.) and higher in the first 12 months; rates of grade 3/4 events were low.

Conclusions. DRV b.i.d. patients had longer ART exposure, higher dosing of RTV, more discontinuations due to treatment failure and AEs and higher previous exposure to lopinavir/RTV, itself associated with hyperlipidemia. Lack of flexible RTV

formulations results in double dosing of RTV in children on b.i.d. regimens.

Table: Characteristics of DRV/r b.i.d. and q.d. children

	DRV/r b.i.d n=82	DRV/r q.d. n=85
	N(%) or median[IQR]	
Daily RTV dose,mg		
100	5(10%)	69(99%)
120 or 160 (liquid)	3(6%)	0(0%)
200	44(85%)	1(1%)
Male	37(45%)	47(55%)
Age starting ART	2[1-5]	9[4-11]
Age starting DRV/r	15[13-16]	15[14-16]
Previous ART exposure:		
Naïve	0(0%)	10(12%)
ABC+2NRTIs	0(0%)	2(2%)
NNRTI/NRTI	7(9%)	15(18%)
PI/NRTI	8(10%)	14(16%)
NNRTI+PI+NRTI	67(82%)	44(52%)
Number of previous ART drugs	9[7-12]	7[3-8]

ESPID-0766

UNDERSTANDING THE IMPACT OF RECOMMENDED BUT UNFUNDED VACCINE STATUS ON PARENTAL ACCEPTANCE OF A NOVEL MENINGOCOCCAL SEROGROUP B VACCINE FOR INFANTS

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BACKGROUND: N. meningitidis serogroup B (MenB) is responsible for the majority of invasive meningococcal disease (IMD). A MenB vaccine is now available. Parents are typically less accepting of recommended unfunded vaccines (RUV) compared to recommend public health funded vaccines (PH).
OBJECTIVES: To assess parents' intentions to vaccinate their infants against MenB and determinants of these intentions in PH funded compared to RUV settings.

METHODS: Parents of infants aged 2 to 6 months (N = 118), presenting for "healthy-baby" visits at 19 clinics across Canada, were interviewed before and after physician interaction in which information about IMD and MenB vaccine was provided. Parents responded to measures of spontaneously elicited beliefs concerning positive and negative aspects of infant immunization, of the MenB vaccine, and of intentions to vaccinate their infants with MenB vaccine in PH and RUV settings.

RESULTS: The majority (84.7%) of parents intended to vaccinate their infants with MenB vaccine when provided free of charge through PH. Intentions to vaccinate infants in RUV settings decreased to 63% (at 50$/dose) and 46.8% (at 100$/dose). Yearly income was explanatory only at the extremes (>$80,000 vs. <$40,000). Absence of PH funding, however, had a substantial impact on beliefs about MenB vaccine: 82% of parents agreed that if MenB "*was really an important threat to infants*,"if the vaccine was "*really effective*"(81%), and if the vaccine was "*safe*"(74%), PH would fund MenB vaccine.
CONCLUSIONS: RUV status has a substantial impact on critical parental perceptions of MenB vaccine necessity, efficacy, safety, and intentions to vaccinate.

ESPID-0768

GROUP A STREPTOCOCCUS VERSUS STREPTOCOCCUS PNEUMONIAE EMPYEMA IN FRENCH CHILDREN, A CASE CONTROL STUDY

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Background: Since several years, an increase of Group A *streptococcus* (GAS) invasive disease was reported worldwide. To compare the characteristics and the severity of GAS empyema versus *Streptococcus pneumoniae* (Sp) empyema in French children, we used the data of pediatric French surveillance network.

Methods: This ongoing observational study is performed in 8 French Pediatric center since 2006. Fifty children between 1 month and 15 years with GAS empyema (cases) have to be paired by age class to 50 Sp empyema (controls).

Results: For now, 32 patients were analysed (16 in each group). Children with GAS empyema were significantly more hospitalized in ICU than those with Sp. No death was reported.

Conclusion: These preliminary data suggest that GAS empyema is a more severe disease than Sp empyema. This ongoing case control study with the complete cohort (n=100) will confirm these results.

ESPID-0769

CLINICAL CHARACTERISTICS OF TUBERCULOSIS IN CHILDREN AND ADOLESCENTS IN SOUTH KOREA: A 10-YEAR EXPERIENCE IN A TERTIARY CARE HOSPITAL OF SOUTH KOREA

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Background and aims: In Korea, the incidence of tuberculosis(TB) was markedly decreased after National TB Control Program, however TB remains an important cause of morbidity and mortality. We aimed to better understand the present epidemiological status of TB, and also to determine whether features predictive of confirmed pulmonary tuberculosis(PTB) could be identified.

Methods: We retrospectively reviewed medical records to classify patients by age groups and sites of TB during the period from Jan. 2004 to Dec. 2013. Clinical and laboratory findings were compared between 2 groups of patients with a presumptive diagnosis of PTB: those with positive cultures, acid-fast bacilli smear (AFB) or polymerase chain reaction (PCR) and those likely to have TB based on clinical criteria but with negative microbiology.

Results: A total of 223 patients aged from 0 to 18 years were enrolled. 41 patients were below 4, 52 were 5 to 14, and 130 were over 15 years of age. Pulmonary manifestation was the most common TB(62.78%), followed by lymph node TB(15.52%), TB pleurisy(7.17%), Bronchial TB(4.93%), TB of bones and joints(3.14%), intestinal TB(2.69%), skin and subcutaneous tissue TB(2.24%), miliary TB(0.90%), TB meningitis(0.45%), and genitourinary TB(0.45%). Among 140 patients with pulmonary TB, 65(46.43%) patients were diagnosed with definitive PTB based on positive microbiology. Another 75(53.57%) patients were classified as having probable or clinical PTB based on meeting at least 2 of the following criteria: cough lasting for more than 2 weeks, radiologic findings, Mantoux reaction, or history of family contact. Patients with definitive PTB were significantly older than patients without probable or clinical PTB(P<0.05). Patients with definitive PTB were more likely than those diagnosed using clinical criteria to have family contact(OR, 2.74; 95% CI, 1.16-6.46) and cough lasting for more than 2 weeks(OR, 1.89; 95% CI 1.08-3.32).

Conclusions: Our study showed that the reduced incidence of TB after age of 5 was begun to increase above 14 years old and the rate of extrapulmonary TB in children was higher than adult. Family contact and long-lasting cough were predictive for definitive PTB.

ESPID-0770

RESPONSE TO HEPATITIS B VACCINE IN A COHORT OF HIV-INFECTED CHILDREN AND ADOLESCENTS

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Background and aims

HIV-infected children and adolescents have a decreased vaccine response and may not maintain immunologic memory.

Methods

We conducted a retrospective cohort study of 95 HIV-infected patients aged 4 to 25 years who are on regular follow-up at the Pediatric HIV Clinic of the Federal University of Sao Paulo, in Brazil. We analyzed response to HBV vaccine, maintenance of anti-HBs above 10 mIU/mL and serologic evidence of HBV infection.

Results

On the last HBV serologic evaluation, 94.7% patients were on HAART, 16.8% had CD4 counts <200 or <15% and 42.1% had HIV viral load <50copies/mL. All of them had at least 3 HBV registered vaccine doses, but 91.5% had 4 to 7 doses. Eighty-three percent seroconverted at some point and 17% never responded to immunization. Among the responders, 44/79 (57.5%) lost antibodies and 9/44 (20.4%) responded to subsequent doses. Serologic evidence of HBV infection was suspected in 6 patients (Table).

Patient	HIV category at anti-HBc+	Age at anti-HBc+	Serology evidence of HBV infection			HBV serology at reevaluation		
			Anti-HBc	Anti-HBs	HBsAg	Anti-HBc	Anti-HBs	HBsAg
1	HIV-exposed	4mo	+	-	-	-	+	-
2	B3	15y	+	-	-	-	-	-
3	B3	16y	+	+	-	-	+	-
4	B3	3y	+	+	-	-	+	-
5	B2	11y	+	+	-	on course		
6	B3	7y	+	+	-	+	+	-

The 4-month infant probably had anti-HBc+ due to placental antibody transfer. Among the other five, only one maintained antibody response to core antigen at reevaluation. None of them developed high AST/ALT levels.

Conclusion

HIV-infected pediatric patients have a poor response to HBV vaccine and can be at risk of both vertical and horizontal HBV infection therefore extra HBV vaccine doses are usually necessary. Evaluation of HBV serologic status should be part of routine screening during childhood and adolescence.

ESPID-0771

EFFICACY AND SAFETY OF LINEZOLID FOR THE TREATMENT OF INFECTIONS IN CHILDREN: A META-ANALYSIS

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Introduction: The need for new antimicrobial agents, both effective and well tolerated, is becoming imperative due to the magnitude of the multi-drug resistance effect. Linezolid is an oxazolidinone antibacterial agent and exhibits a broad spectrum of activity against Gram-positive bacteria.

Objectives: This study aimed to evaluate the efficacy and safety of linezolid in children with infections caused by Gram-positive pathogens.

Methods: A systematic search in electronic databases was conducted up to September 2013. The accumulated relevant literature was subsequently systematically reviewed and a meta-analysis was conducted. Eligible studies were randomized controlled trials assessing the efficacy and safety of linezolid in children. The primary outcome was the effectiveness of linezolid in clinical evaluated (CE) and microbiologically evaluated (ME) patients at test of cure visit. Meta-analysis was conducted with random-effects models and Odds Ratios (OR) with 95% Confidence Intervals (C.I) were the summary measures. Two randomized controlled trials (RCTs), involving 815 patients, were included.

Results: Linezolid was slightly more effective than control antibiotic agents, but the difference was not statistically significant (OR=1.22, 95% CI: 0.79-1.89). Treatment with linezolid was not associated with more adverse effects in general (OR=0.61, 95% CI: 0.25-1.48) and it mainly affected the gastrointestinal system. Eradication efficiency did not differ between linezolid and control regimens, but the sample size for these comparisons was small.

Conclusions: Linezolid appears to be a good choice in children for the treatment of infections due to Gram-positive pathogens. Further studies providing evidence for clinical and microbiological efficacy of linezolid will support its use.

ESPID-0772

LABORATORY CONFIRMATION OF PERTUSSIS INFECTION IN PRIMARY CARE: A PILOT STUDY USING REAL-TIME PCR ON NASOPHARYNGEAL AND THROAT SWABS

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Introduction and aims: A pilot study was initiated to compare PCR detection of *Bordetella pertussis* in nasopharyngeal and throat swabs (NPS vs. TS) and patient acceptability of swab type. GP patients with suspected pertussis were offered testing (NPS and/or TS) and follow-up with an oral fluid (OF).

Methods: Between 01/07/13 and 6/01/14, 220 respiratory specimens from 171 patients (age 3 months to 79 years, median 30 years) were received and tested using real-time PCR. OFs were obtained from 65 of these patients to determine anti-pertussis toxin IgG titre.

Results: Forty-eight patients provided paired NPS and TS; 112 patients NPS only; and 11 TS only. *Bordetella* DNA was detected in 18/171 (11%) patients. Forty-two of 48 pairs gave concordant results; 3 patients were PCR positive and 39 patients negative in both samples. Of the discordant paired samples; 4 were positive by TS only; one by NP only; and one patient with a negative result from NP had an inhibitory result from TS. Ten of 112 NPS only patients were PCR positive; all 11 TS only patients were PCR negative. Twenty-three of 65 patients from whom OF follow-up samples were obtained had evidence of recent pertussis infection. Six patients were positive by both PCR and OF.

Conclusions: The feasibility of using TS and/or NPS for diagnosing pertussis in primary care settings across all age groups was demonstrated. Sampling using TS vs. NPS was perceived to be more acceptable. PCR can provide earlier confirmation of diagnosis, but use of OF increased this proportion.

ESPID-0773

MICROBIOLOGICAL CHARACTERISTICS OF GROUP B STREPTOCOCCUS AMONG CHILDREN IN JAPAN

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Background and aims: Penicillin non-susceptible Group B *streptococcus* (GBS) strains were recently reported among female adults in Japan. However, the prevalence among children is unknown. In addition, GBS vaccines are currently under development and knowing invasive serotypes are important. Our aim of study is to evaluate distribution of Penicillin Minimum Inhibitory Concentration (MIC) and serotypes among GBS isolates from children.

Methods: GBS isolates of invasive diseases and colonization were collected from four children's hospitals from January 2008 to December 2013 in Japan. Isolates from adults were excluded. GBS was tested for penicillin MIC by broth microdilution. Penicillin MIC 0.12μg/ml and less were interpreted as susceptible. Serotyping was performed for isolates from invasive diseases.

Results: GBS isolates analyzed were 235. Isolates from invasive diseases and colonization were 40 and 195, respectively. Penicillin MICs <0.03 μg/ml, 0.06 μg/ml and 0.12 μg/ml were 37 (17.4%), 169 (79.7%) and 3 (1.4%), respectively. Penicillin non-susceptible strains were not detected. Among invasive diseases, 35 isolates were serotyped. Common GBS serotypes were Ia (26%), Ib (17%) and III (37%) which represented 80% of isolates from invasive diseases.

Conclusions: We did not identify Penicillin non-susceptible strains among children; however penicillin susceptibility among children should be monitored closely. Serotypes of Ia, Ib and III were common for invasive GBS diseases. These serotypes can be targeted for vaccine development.

ESPID-0774

FEBRILE NEUTROPENIA IN PEDIATRIC ONCOLOGY

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Introduction: Sepsis is a life-threatening emergency. Microorganism identification and antimicrobial susceptibility pattern enable a quick and effective intervention. Fever during a chemotherapy-induced neutropenia can be the only sign of severe infection. Objective: To evaluate febrile neutropenia, its clinical and analytical variability.

Material and Methods: Retrospective study evaluating clinical files of patients with febrile neutropenia (FN) admitted to the Pediatric Oncology Department – Portuguese Institute of Oncology Porto, for a period of 12 months.

Results: There were 99 cases of FN (69 in patients with liquid tumors, solid tumors in 22 cases, remaining with other conditions). Reason for admission: FN in 61 cases, chemotherapy in 21 cases, suspicion oncologic pathology in 12 cases, the remaining for other reasons. Isolation of agent was possible in 14.24% (Table 1). Only 8 pathogens were susceptible to all antimicrobials tested. Piperacillin and tazobactam were started empirically in 78% of patients. Antibiotic was changed or added another one in 69% of cases. 79% experienced thrombocytopenia, increased C-reactive protein in 89% and increased procalcitonin in 26% of patients. 40% of patients had mucositis, while 13 had prolonged neutropenia (> 10 days). 2 patients required PICU. Average length of stay: 16 days.

Pathogen	Isolates n = 53 (corresponding to 26 patients) in 372 HC harvested	Corresponding number of patients
Gram positive		
Staphylococcus hominis ssp hominis	1 + 1	2
Staphylococcus epidermidis	2 (sp) + 3 (sp) + 1 + 6 (sp) + 3 (sp)	5
Staplylococcus aureus	1	1
Staphylococcus haemolyticus	2 (sp)	1
Streptococcus mitis	1+5(sp)	2
Total	27	11
Gram negative		
Pseudomonas aeruginosa	1+1+1	3
Pseudomonas putida	1	1
Sphingomonas paucimobilis	1	1
Escherichia coli	2 (sp)+1+1	3
Stenotrophomonas maltophiliastenotrophomonas maltophilia	2 (sp)+1	2
Acinetobacter baumannii	1	1
Acinetobacter lwoffii	1	1
Klebsiella pneumoniae	5 (sp)+ 2 (sp)+1+1	3
Enterobacter cloacae	1	1
Total	24	16
Fungi		
Candida parapsilosis	1	1
Candida guilliermondii	2	1
Total	3	2
Total	53	29 - 3 patients with 2 different agents isolated simultaneously ? 26 patients

Table 1: Isolated pathogens from blood cultures. Sp = same patient

Discussion / Conclusion: FN is a common complication and a major cause of morbidity and prolonged hospitalization, but no recommendations and therapeutic approach as well as validated risk stratification schemes exist. At the initial approach to FN is essential to harvest a blood culture.

ESPID-0775

NEW PROTOCOL FOR MANAGEMENT OF NEONATE WITH FEVER

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It's challenging to identify newborns with a low risk of serious bacterial infection risk. The Boston, Philedelphia and Rochester protocols could be used for the infants older than three months with fever. There was no suitable protocol for management of fever in neonatal period.

Aim: Our study aim to analyze effectiveness of new protocol for identifying serious bacterial infection (SBI) in neonatal period.

Methods: In two years period, 91 infants admitted with fever to NICU were enrolled. Sisli Etfal protocol compared with Boston, Philedelphia and Rochester protocols according to excluding SBI. Sisli Etfal protocol included: good appearence, normal examination, no medical history and dehidration, leukocyte count 5000-15000/mm^3, I/T <0.2, absolute neutrophil count <1000/mm, urine microscopy <10 hpf/leukocyte, CSF microscopy <10 hpf/leukocyte, normal chest x-ray and C-reactive protein <1 mg/dl for excluding serious bacterial infection (SBI).

Results: Out of the 91 patients included in the study, 31 of them (%34,1) were diagnosed with serious bacterial infection (SBI). The most common diagnosis were urinary tract infection (38.7%), bacteriemia (29%) and pneumonia (16%) in infants with SBI. The negative predictive value of Boston, Philedelphia, Rochester and Sisli Etfal protocols were %92, %92, %83 and 97%, respectively.

Conclusions: In conclusion we identified Sisli Etfal protocol had the highest negative predictive value among the other protocols. This data shows that 97% of the patients that are identified with a low risk of SBI do not have SBI according to the Sisli Etfal protocol. Addition of C-reactive protein could be increased effectiveness of these protocols.

ESPID-0776

ACUTE ENCEPHALITIS RELATED TO EPSTEIN BARR VIRUS (EBV)

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Encephalitis is a rare complication of EBV infection. We report 3 cases from April 2012.

1: four years-old; fever , sore throat, drowsiness, hyporeactivity, mutism. Clinically: neck stiffness, photophobia, hyperreflexia. Negative blood tests and brain CTScan. CSF: clear, normal pressure, 20 cells/mmc, negative Gram Stain. Treatment: acyclovir and ceftriaxone IV. Brain MRI: basal nuclei signal alterations.

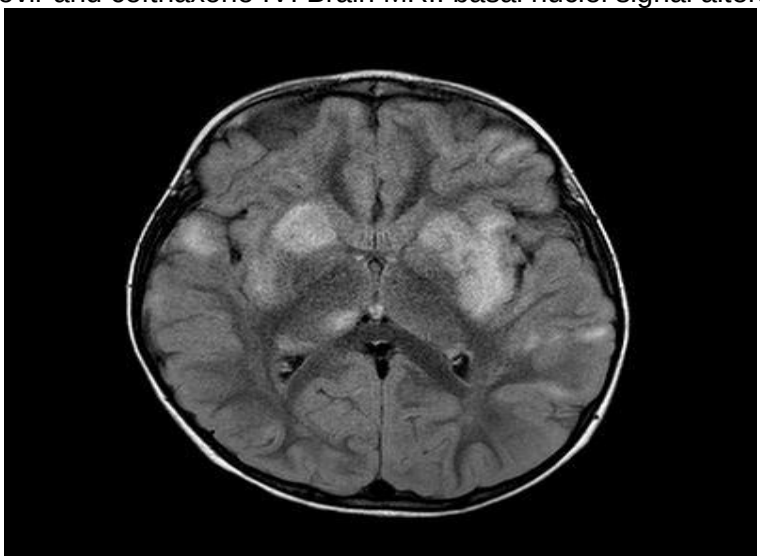


Fig1.

PCR in CSF, blood and plasm was positive for EBV, together with serology (IgG and IgM). Outcome: clinical improvement, negative brain MRI control after 2 months.

2 : three years-old; recurrent fever, headache, ataxia; mononucleosis diagnosis 2 weeks before. Clinically: plaintive, feverish, neck and back pain and stiffness. WBC 20160/mmc (N 60%), ESR 64 mm/h. CSF: clear , high pressure, 35 cells/mmc, negative Gram Stain. Treatment: acyclovir and ceftriaxone IV. PCR in CSF, blood and plasm was positive for EBV, together with serology . Brain MRI: encephalomyelitis.

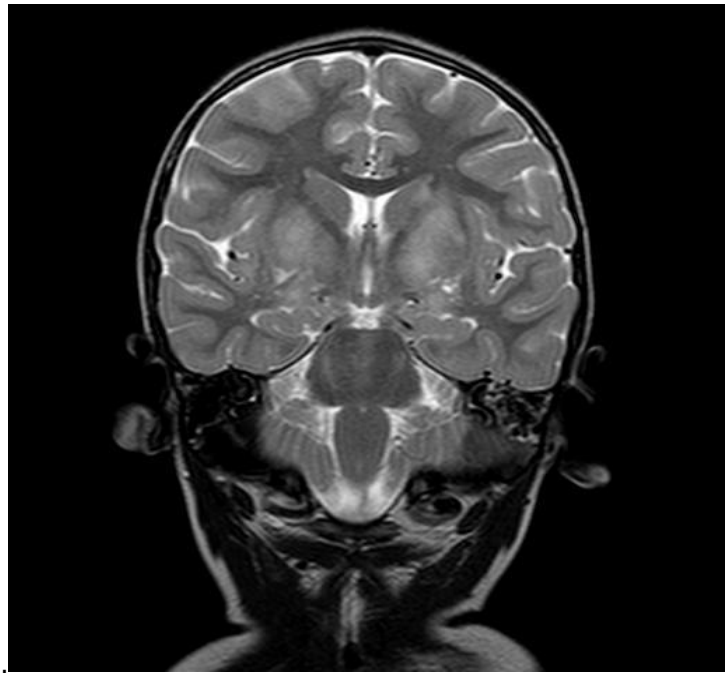
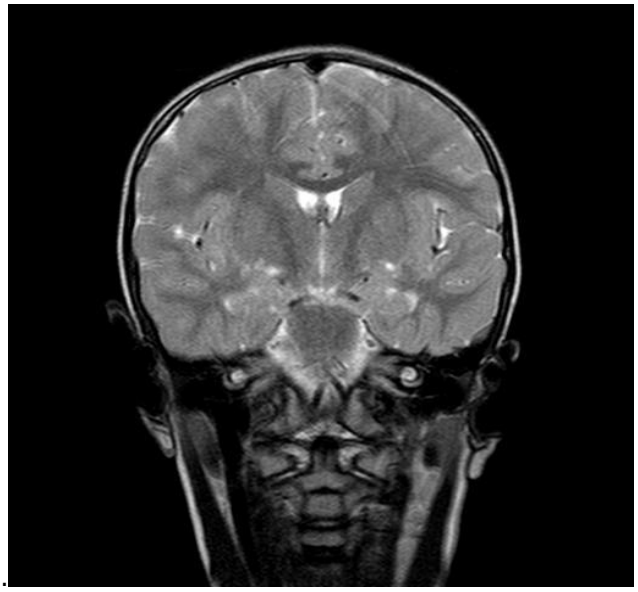
Fig2. 
Immunoglobulin infusion (400 mg/kg/d for 5 days) was made. Clinical improvement. Negative brain MRI control after 2 months.

Fig3. 

3: seventeen years-old; fever, sore-throat, asthenia treated with oral corticosteroid. Then dizziness, slurred speech, ataxia, rash. Clinically: dysarthria, dysmetria, hypotonia, maculo-papular rash, tonsillar exudate, epatomegaly. WBC 10700/mmc (L 58%), AST 69, ALT 161 U/L. CSF: clear, 10 cells/mmc, negative Gram stain. Treatment: acyclovir and ceftriaxone IV. PCR in CSF was positive for EBV, together with EBV serology . Brain MRI: normal. Clinical recovery in 2 weeks.

Diagnosis of EBV-encephalitis requires molecular and neuroimaging techniques. Usually there is complete neurological recovering without sequelae.

ESPID-0777

LUXEMBOURG 2012 VACCINATION COVERAGE SURVEY OF 25 TO 30 MONTH OLD CHILDREN

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Background and aims: This fourth vaccination coverage survey among infants and toddlers in Luxembourg aims at evaluating the free of charge pediatric vaccination program by the Health Directorate.

Methods: A stratified sample of 739 children aged 25 to 30 months was selected. Their parents were sent a postal request for submitting their child's vaccination certificate and for participation in an auto-administrated questionnaire identifying socio-demographic determinants, vaccination side effect and motivations for vaccine refusal. Analysis considered total coverage, respect of minimum age at vaccination and between-dose interval.

Results: The response rate was 81.9% (605 respondents). Coverage for DTaP, IPV, Hib, HBV, PCV13 and MCV vaccines reaches 95% while RV1 coverage is 89%. MMRV vaccine coverage is 99% for the first dose but only 83.3% for the booster dose. Minimum age and between-dose interval is respected for more than 95% of all vaccine doses except for the newly (2011) introduced 2+1 PCV13 scheme, 65% of children receiving PCV13 booster dose before the minimum age of 12 months.

Conclusions: Vaccination coverage remains high in Luxembourg, showing high acceptance rates even for newly introduced vaccines. However, compliance delays to recent vaccination schedule changes are observed, in particular for PCV13 and MMRV boosters. MMRV vaccination could not attain herd immunity thresholds while higher booster dose coverage is needed in view of the WHO-Europe 2015 measles and rubella elimination goal.

ESPID-0778

PATTERN AND TRENDS OF ANTIMICROBIAL USE IN A PEDIATRIC DEPARTMENT DURING 12 YEARS

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Background and aim: Monitoring of antimicrobial use is essential for antimicrobial stewardship programs. We studied pattern and time trends of antimicrobial use in a general pediatric department (GPD).

Methods: A retrospective analysis of annual antimicrobial agent utilization was conducted in a 33 bed GPD of a general university-affiliated hospital from 2001 to 2012. Defined Daily Doses (DDDs, according to WHO) of each antimicrobial agent/category divided by 100 bed-days (DDD/100BD) were used.

Results: Total antimicrobial use significantly increased from 67.6 to 82.9 DDD/100BD ($p=0.015$). Beta-lactams were the most commonly used antimicrobial class. Penicillins' utilization ranged between 16 and 25 DDD/100BD. Utilization of beta-lactamase sensitive penicillins decreased from 3.5 to 0.8 DDD/100BD ($p=0.011$), whereas utilization of penicillins with extended activity spectrum increased from 8.7 to 10.6 DDD/100BD ($p<0.05$). Utilization of 2nd generation cephalosporins ranged between 13-20 DDD/100BD, whereas utilization of 3rd generation and carbapenems increased from 9.2 and 1 to 10.3 and 6.7 DDD/100BD, respectively (both, $p<0.02$). Macrolides were the second most common antimicrobial class (6.9 -10.4 DDD/100BD) until 2009. Aminoglycosides increased from 6.1 to 11.7 DDD/100BD ($p<0.01$) and became the 2nd most used antimicrobial class after 2010. A significant increase was found in utilization of fluoroquinolones (0.1 to 1.7DDD/100BD, $p=0.039$) and colistin (0.9 to 3.8 DDD/100BD, $p=0.01$). Clindamycin use (range: 0.3 to 2.6 DDD/100BD) and glycopeptide use (range: 0.6-2.7DDD/100BD) had no significant changes.

Conclusion: Total antimicrobial utilization increased significantly over the last twelve years in this pediatric department. Rising utilization rates of aminoglycosides, carbapenems, fluoroquinolones and colistin are of concern.

ESPID-0779

FIELD OF DREAMS 2 : "IF YOU OFFER IT THEY WILL COME" - A NATIONAL PILOT OFFER OF SEASONAL FLU VACCINE IN SCHOOL AGE CHILDREN

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Introduction: in 2012 the Joint Committee for Vaccination and Immunisation recommended the phased introduction of seasonal influenza live attenuated intranasal vaccine (Fluenz) to all children. For the 2013/14 season Scotland implemented a national offer of Fluenz to all children aged 2 & 3 and a pilot offer of Fluenz in each health board area to Primary School age children - ages 4-11 inclusive - either in a limited number of whole schools or to single school year groups. Dependant on the administering location vaccination data was entered into the Scottish Child Health Systems Programme - Schools (CHSP-S) or primary care (PC) record respectively.
Objectives: Describe uptake by age, sex, socioeconomic status, ethnicity for Primary School age children.
Methods: National aggregated data submitted weekly with data validation by electronic data extraction from PC & CHSP-S
Results: Provisional all Scotland uptake in primary school pilots across all ages was at least 67.5% (data reconciliation with PC data in Jan 2014 is expected to increase this by around 5%). Whole school pilots show significant trend to lower uptake from Year Group 1 (age 4/5 years) to Year Group 7 (age 10/11) across all deprivation quintiles and by proportion of school in an ethnic minority. Significantly lower vaccine uptake was observed in schools with highest ethnic minority proportion in school roll.

Conclusion - The offer of Fluenz in this pilot in Scotland is well accepted by parents with good uptake in children. The results inform Scottish Government Policy decision for season 2014/15 and 2015/16.

ESPID-0780

NEONATAL SEPSIS IN VERY-LOW-BIRTH-WEIGHT INFANTS DURING 16 YEARS

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Background: Knowledge of antimicrobial resistance and trends in resistance patterns among major pathogens is important to adequate antibiotic use in very low birth weight infants (VLBW).

Aim: Determine frequency of bacterial isolates in VLBW with sepsis, patterns and antibiotic resistance.

Methods: Retrospective, descriptive study of medical records and microbiological data with sepsis and positive blood cultures admitted in neonatal intensive care unit, between 1998-2013. Early onset neonatal sepsis (EOS) and late onset neonatal sepsis (LOS) were defined as illness appearing from birth to 72h and after 72h, respectively. *Coagulase-negative sthaphylococcus* (CoNS) were included if ≥1 parameters: leucocyte count >30.000/µL or <5000/µL, platelet counts <100.000/µL and C-reactive protein ≥2mg/dL. Pathogen distribution, antimicrobial susceptibility of the isolates and changes in trends over this period, were studied. Statistical analysis: *SPSS 21.0.*

Results: 852 VLBW infants were admitted, 133 had sepsis with total of 148 episodes (13 EOS/135 LOS). *Escherichia coli* was the leading pathogen of EOS in 54% episodes. CoNS was the leading pathogens of LOS in 69%, fungi 9% and gram-negative 7%. *Methicillin-resistant Staphylococcus aureus* (MRSA) was isolated in 4 episodes. CoNS and MRSA showed no resistance to vancomycin. *Escherichia coli* was resistant to gentamicin and third-generation cephalosporins in two episodes, and ampicillin in 92%. Death occurred in 14%: 38% with EOS and 12% LOS (p= 0,02).

Conclusions: The majority of EOS was caused by gram-negative and LOS by gram-positive organisms. Pathogens distribution changed little over the period of study. Mortality in EOS was higher than in LOS.

ESPID-0781

PERTUSSIS VACCINATION AND EPIDEMIOLOGY IN FLANDERS (BELGIUM) - NEED FOR ALTERNATIVE VACCINATION STRATEGIES FOR FUTURE

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- **Background and aims**

Since the change from whole cell to acellular pertussis vaccines in the vaccination programme of Flanders, extra pertussis vaccination moments have been implemented for children and adolescents. We want to evaluate the impact of these vaccinations and the need for new strategies to better protect the population against pertussis.

- **Methods**

We reviewed the epidemiology of all notified pertussis cases in Flanders from 2000 till 2013 in relation to changes in the vaccination programme. Based upon these findings decision is made for future strategies to avoid pertussis.

- **Results**

Despite of high vaccination coverage the number of notified pertussis cases increased from 2004 onwards. A booster dose of pertussis vaccine at the age of 6 years was given from 2004 onwards. In 2009 adolescent vaccination was started at the age of 14 years. The next three years less cases were notified. From 2012 onwards the number of reported cases is rising again.

As cocoon vaccination is hard to realise and doesn't seem to be successful, alternative strategies are needed to protect the most vulnerable for pertussis, the newborns.

- **Conclulsions**

In Flanders decision was made to add pertussis vaccination of all pregnant women to the vaccination programme in order to protect newborns with maternal antibodies at birth, awaiting protection by their own immune system after vaccination.

To reduce spread of pertussis, we consider offering a combination vaccine with pertussis at the moment of the next adult booster vaccination against tetanus and diphtheria.

ESPID-0783

TWO CASES OF HUMAN PARECHOVIRUS 3 (HPEV3) INFECTION IN NEONATAL ENCEPHALITIS

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Introduction and aims: Human parechoviruses (hPeVs) *(Picornaviridae)* infections are enteric and often associated with mild gastrointestinal and respiratory symptoms, although severe neonatal diseases including sepsis, meningitis, encephalitis and hepatitis have been reported. We describe two cases of hPeV3 neonatal encephalitis.

Methods: A 16 day-old boy and a 9 day-old girl, presenting with fever (>39°C), irritability, plaintive tears and decreased feeding, were hospitalized on July 2012 and April 2013, respectively. Seizure activity appeared 6-48 hours after their hospital admission.

Laboratory analyses, chest radiograph, and brain magnetic resonance imaging (MRI) were undertaken. Molecular investigations for virus infection (herpes simplex 1 and 2, herpes virus 6, cytomegalovirus, adenovirus, parvovirus B19, BK/JC viruses, enteroviruses, hPeVs) were performed by molecular assays (PCR/RT-PCR) on blood, nasopharyngeal swab, stool, and cerebrospinal fluid (CSF) specimens.

Results: In both cases, laboratory analyses and chest radiograph were normal. MRI pictures, undertaken after seizure appearance, showed multiple punctuated white matter lesions characterized by restricted diffusion, rousing suspicion of viral encephalitis. Chemical and physical examination of CSF were normal in both patients. Molecular investigations resulted negative to all considered viruses but tested positive for hPeV-RNA in all biological samples examined, thus suggesting virus dissemination. Viral genome sequencing indicated the presence of hPeV type 3.

Conclusions : In neonates presenting with fever, irritability, and signs of encephalitis, if CSF examination is normal, is important to consider hPeV and enterovirus infection. Detection of hPeVs and enteroviruses by multiplex real-time RT-PCR should be undertaken as part of laboratory routine testing in neonates with severe disease presentations.

ESPID-0784

ANTIMICROBIAL RESISTANCE AMONG ESCHERICHIA COLI STRAINS THAT CAUSE CHILDHOOD URINARY TRACT INFECTION IN A UNIVERSITY HOSPITAL OF TURKEY

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Objectives: The aim of this study was to evaluate demographic characteristics, clinical presentations and antimicrobial resistance among infants and children who were diagnosed with UTI caused by *E.coli* spp in follow up outpatient and inpatient clinics in Balcali Hospital of Cukurova University, Adana, Turkey .

Methods: In this retrospective study, 108 urinary culture positive infant and children who had been admitted with UTI diagnosis, from January to December 2012 were evaluated . Out of 108 urinary culture positive children 77 (71.3%), were determined with *E.coli* spp. These 77 children's 386 urinary cultures and antimicrobial susceptibility testings were evaluated.

Results: The mean age of the patients was 86 months. The male to female ratio was 19/58 ($p<0.05$)

Out of 77 urinary culture positive children 27 (35.1 %),were determined antibiotic use in preceeding 1 month, 39 (50.6%) had UTI at least once.

42.9% of *E.coli* strains were extended-spectrum beta-lactamase (ESBL) positivity. The ages of the patients with ESLB (+) and *E.coli* positive (median: 75 months) were statistically lower than the ages of those with ESBL (-) (median: 108.5 months)($p<0.05$)

Escherichia coli spp were highly resistant to ampicilline (AMP) (88.7%), trimethoprim/sulfamethoxazole (TMP/SMX) (77.8%), ceftriaxone (CTX) (60.8%), and intermediate resistance to nitrofurantoin (14.5%) , and highly sensitive (100%) to amikacine, meropenem, imipenem.

Conclusion: *Escherichia coli* spp showed low susceptibility to AMP and TMP/SMX. Therefore, the use of AMP and TMP/SMX with orally and CTX with parenterally, as the first choice in empirical and prophylactic treatment of childhood UTI in Adana shoud be reconsidered.

ESPID-0785

CHANGING CLINICAL SPECTRUM OF MALARIA: A HOSPITAL BASED OBSERVATIONAL STUDY

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Background: Malaria is endemic in developing countries across the world and is associated with significant morbidity and mortality. Recently, a significant change in clinical presentation and various laboratory parameters has been reported worldwide.

Objective: The present study was aimed to study the changing trend of clinical and laboratory parameters of the children suffering from malaria in Indian subcontinent.

Methods: This prospective study evaluated 30 children aged 1 – 17 years admitted at various hospitals of Rajasthan, India from July to October 2013, having malaria. A detailed clinical history, examination and relevant laboratory investigations were recorded on the day of presentation.

Results: In severe cases of malaria, *Plasmodium vivax* was the predominant organism in 63.6% cases whereas *Plasmodium falciparum* was present in 13.6% cases. Mixed infection of both species was seen in 22.7% cases. Among children presenting with uncomplicated malaria, *Plasmodium vivax* was observed in 50.0% cases whereas *Plasmodium falciparum* and mixed infection was seen in 37.5% and 12.5% respectively. Most common clinical presentation was fever (96.7%), followed by splenohepatomegaly (73.3%), anemia (56.7%) and jaundice (10%). Most common complication was severe anemia (30%) followed by bleeding (26.7%), altered sensorium (20%), convulsions (13.3%) and pulmonary edema (10%). Among laboratory parameters, thrombocytopenia was observed in 70% and deranged hepatic functions were observed in 23.3% children.

Conclusion: In changing clinical spectrum of malaria, *Plasmodium vivax* is predominantly associated with severe malaria. Presence of thrombocytopenia,severe anemia,bleeding tendencies in a patient of acute febrile illness should alert the clinician for the possibility of MALARIA.

ESPID-0786

PNEUMOCYSTIS JIROVECII IN INFANCY: IS IT SIGNIFICANT?

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Background
Pneumocystis jirovecii is a fungus which is well known to cause severe pneumonia in immunocompromised individuals. There is emerging evidence that pneumocystis may be a pathogen in immunocompetent infants. Children are known to have serological evidence of the organism, but there is limited evidence of associated respiratory illness. A study in 2001, in Denmark, tested respiratory secretions of 422 children and found an overall prevalence of 16% of infants with pneumocystis positive who were admitted with respiratory symptoms.
Aim
The aim of this review was to describe *P.jirovecii* epidemiology in a paediatric population.

Methods

Pneumocystis jirovecii PCR has been routinely performed on all paediatric respiratory specimens, over a 2 year period in a Regional Virus Laboratory. Review of all the respiratory secretion samples that were positive for Pneumocystis in the last 2 years from paediatric patients was undertaken

Results

1098 infants under 1 year old had secretions sent for suspected clinical respiratory testing. Of these 103 (9.4%), were positive for pneumocystis jirovecii, In contrast 725 samples were sent from patients aged 1-10 years old, and only 4 (0.6%) positive samples were found. In the 10-20 year old age range 256 samples were tested and only 5 (2%) were positive. Most infants were not treated, however if treatment was instigated, levels dropped significantly.

Conclusion

Pneumocystis jirovecii may be an emerging pathogen in Paediatrics. It is unclear whether positive samples represent primary infection or harmless transient carriage. This data adds to the current evidence base and requires further investigation.

ESPID-0787

THE SUCCESSFUL ERADICATION OF ENDEMIC NEONATAL MRSA FOLLOWING EXTENSIVE NEONATAL INTENSIVE CARE UNIT REFURBISHMENT

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Introduction

Nosocomially acquired methicillin- resistant *Staphylococcus aureus* (MRSA) is a significant cause of morbidity and mortality in the neonatal intensive care unit (NICU). Current national guidelines recommend regular surveillance in the NICU by screening all infants for MRSA carriage on NICU admission and weekly thereafter.

Objectives/Aims

Over a 5-year period and despite multiple attempts with standardised eradication procedures, endemic MRSA was finally eradicated following complete NICU refurbishment.

Methods

Surveillance, colonisation and infection data for a 4-year period pre and 1-year period post NICU refurbishment are described. Clinical and microbiological data were collected on all MRSA colonised and infected infants between 2008 and 2012. Microbiological and molecular typing data are available for all MRSA isolates. All eradication strategies are described.

Results

During the 5-year study period, following routine surveillance, 68 infants were documented to be colonised with MRSA. Almost all strains were from epidemic MRSA 15 clone, EMRSA-15 (Sequence Type 22 Staphylococcal Cassette Chromosome mec IV). Standard eradication strategies including isolation, decontamination, staff education and staff screening failed to impact on colonisation rates. During the 1-year period since complete refurbishment and redesign of the NICU, no further nosocomially acquired MRSA colonisation has been documented.

Conclusion

Infrastructure and overcrowding in the NICU contributed significantly to the failure to eradicate endemic MRSA in this setting.

ESPID-0788

MULTIFUNCTIONAL T CELLS IN THE SEARCH OF A BETTER DIAGNOSTIC TOOL FOR TUBERCULOSIS IN CHILDREN

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Background: Differences in the pathophysiology and clinical presentation of tuberculosis in children make diagnosis more challenging than in adults. Moreover, existing immunodiagnostic tests, including tuberculosis skin test (TST) and interferon gamma release assays (IGRA), cannot distinguish between latent tuberculosis infection (LTBI) and active disease .

We investigated whether measurement of mycobacterium-specific (multi)functional T cells could help us define different immunotypes related to clinical manifestations.

Methods: Children aged 0-18 years exposed to tuberculosis, underwent standard clinical assessment including TST and IGRA. In addition, peripheral blood mononuclear cells were incubated 5 days in presence of mycobacterial antigens PPD, ESAT-6, CFP-10 and nHBHA. After staining for surface (CD3, CD4) and intracellular markers (IFNg, TNFa, IL-2 and IL-17), cells were analysed by multi-colour flow cytometry.

Results: Fifteen participants had active TB, nineteen had LTBI and 29 were uninfected. The proportion of IFNg single positive T cells was significantly higher in children with LTBI compared to active TB cases for all antigens except CFP-10. In addition, the proportion of IL17 single positive T cells was significantly higher in children with LTBI after stimulation with nHBHA. Active TB patients distinguished themselves by a significantly higher proportion of TNFa single positive T-cells and a tendency ($p=0.051$) towards a higher proportion of triple positive (IFNg, TNFa, IL-2) T-cells after stimulation with ESAT-6.

Conclusions: Mycobacteria-specific cytokine profiles may help improve TB diagnosis in children.

ESPID-0789

SEROLOGICAL CORRELATES OF PROTECTION AGAINST A GII.4 NOROVIRUS

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Introduction/Objectives/Aims: Noroviruses are the most common cause of epidemic and endemic gastroenteritis. Serum antibody that blocks virus binding to histoblood group antigen (HBGA) has been associated with a lower risk of illness and infection following Norwalk virus (GI.1) inoculation, but similar studies have not been reported for other norovirus genotypes. The aim of this study was to examine the association of pre-challenge serum antibody levels with infection and illness following GII.4 norovirus inoculation.

Methods: Healthy, secretor-positive adults ages 18-49 years were randomized equally to two study groups to either receive two intramuscular injected doses of investigational norovirus bivalent GI.1/GII.4 VLP vaccine or saline placebo on days 0 and 28. On or after day 56, subjects received an oral dose of $4.4x10^3$ PCR units of live GII.4 norovirus and were monitored inpatient for ≥ 96 hours for symptoms and severity of gastroenteritis. Pre-challenge serum antibody levels were determined.

Results: 48 of 98 participants received placebo in the per-protocol analysis. Serum HBGA-blocking and IgA GII.4 antibody GMTs were significantly higher among placebo recipients who did not develop mild, moderate or severe vomiting or diarrhea (VorD) or infection.

Pre-Challenge Serum GMTs of Placebo Recipients			
	Yes	No	P value
HBGA-blocking			
Infected	103.5	220.3	0.001
VorD	103.8	172.4	0.011
IgA			
Infected	4.6	9.2	0.009
VorD	4.5	7.5	0.051
IgG			
Infected	5.6	10.2	0.102
VorD	6.1	8	0.621

Conclusions: Serum HBGA-blocking and IgA, but not IgG, antibody levels correlate with protection against GII.4 norovirus illness and infection.

ESPID-0790

HIV PAEDIATRIC INFECTIONS IN THE NEW HAART ERA: THE RULE OF AN EARLY AND MEGA-HAART

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Background and aims: The research for new therapeutic strategies for HIV paediatric infections has recently strengthened the concept of "early treatment" see the case of the "Mississippi baby. We analyzed the virological and immunological response to early treatment and different schedule (3 drugs versus 4 drugs)

Methods: We evaluated plasma viral load and CD4 percentage and absolute count at 0 – 3 – 6 months after treatment beginning in a cohort of 12 HIV vertical infected children, treated in the first year of life (median age at treatment beginning 4,6 months; range: 0 – 11 months) with an HAART regimen including 3 or, alternatively, 4 drugs.

Results: After 6 months of treatment all children treated within 6 months of age (8; 66,7%) presented a suppression of plasma viral load; instead children treated after six months of age (4; 33,3%) presented a detectable viral load, except for n=1 children (8,3%). However, children treated with 4 drugs showed a decrease of HIV Load /day :2.659,09 copies/day (4 drugs), vs. 442,39 copies/day (3 drugs). Children with a good immunological state at treatment beginning 8 (66,6%), maintain the same condition.

Conclusions: An early intervention seems to be useful to limit the time of viral replication and it could limit its cytopathic effect; furthermore, considering initial viral load, an initial 4 ARVs regimen could be more effective than a 3 ARVs regimen. At last, starting therapy when immunological condition is still good, allows preserving immune system.

ESPID-0791

ANALYSIS OF N-ACETYLTRANSFERASE-2 GENE IN VENEZUELAN CHILDREN WITH TUBERCULOSIS REVEALS HIGH GENOTYPIC DIVERSITY RELATED TO SIGNIFICANT PHARMACOKINETIC VARIETY

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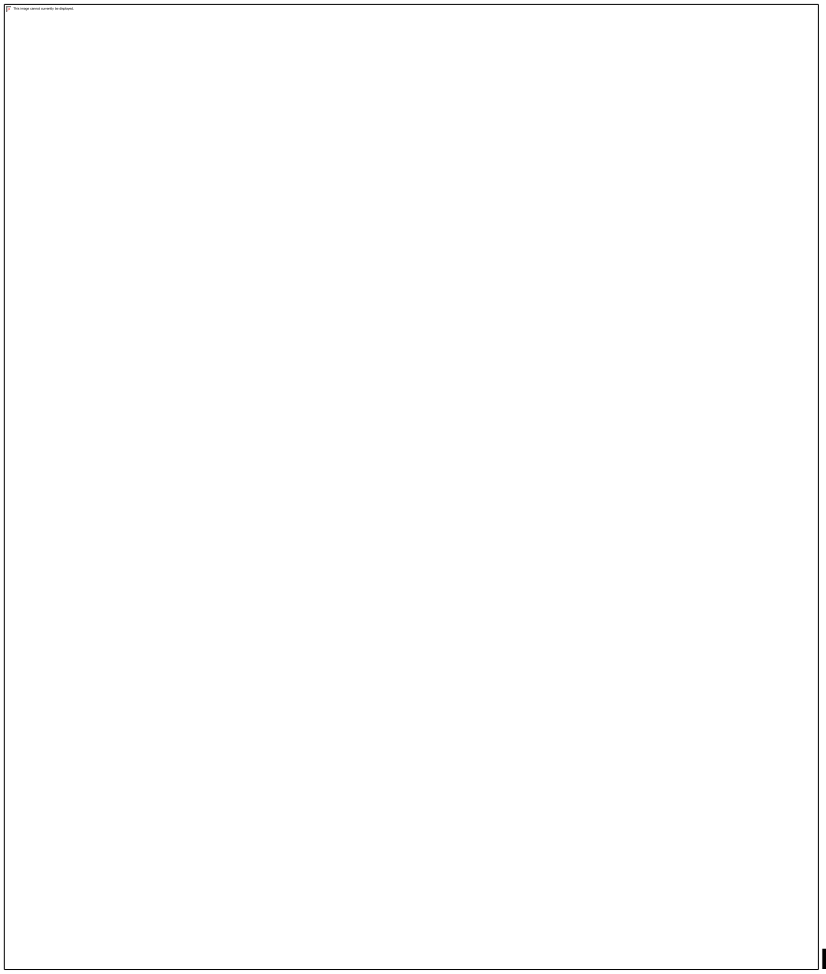

Background: The genetically polymorphic arylamine N-acetyltransferase type 2 (NAT2) enzyme is

responsible for isoniazid metabolism. *NAT2* genotype-guided dosing stratification of isoniazid has been proposed as a method to minimize adverse reactions in adult tuberculosis patients. Phenotypic classification could provide an easily accessible alternative to genotyping.

Methods: *NAT2* genotyping and phenotyping were performed in 30 Venezuelan tuberculosis patients aged 1 to 15 years. Genomic DNA was isolated for sequencing of the coding region of the *NAT2* gene. Two methods assessing the acetylator status phenotypically were performed: determination of the plasma half-life of isoniazid and calculation of the metabolic ratio of acetylisoniazid and isoniazid at 2 hours post dose.

Results: Eleven different *NAT2* alleles corresponding to 16 different *NAT2* haplotypes were identified. One new mutation was identified and assigned the official symbol *NAT2*7G* by the NAT Gene Nomenclature Cammittee. While the prescribed isoniazid dose in mg/kg was equal, the exposure to isoniazid (AUC_{0-24}) varied more than six-fold. This variation correlated with the *NAT2* genotype. Both the metabolic ratio as well as the half-life of isoniazid significantly distinguished genotypically slow from genotypically fast or intermediate acetylating children (Figure 1).

Conclusions: A large degree of variability in *NAT2* haplotypes can lead to inter-individual differences in exposure to isoniazid when anti-TB drug dosing guidelines are standardized for the whole country.

ESPID-0793

EFFECT OF ZINC SULFATE SUPPLEMENTATION ON OTITIS MEDIA WITH EFFUSION IN CHILDREN IN BORUJERD, IRAN

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Background: To determine the effect of oral zinc sulfate supplementation given with coamoxiclav as compared with coamoxiclav alone for treatment of otitis media with effusion (OME). The efficacy was assessed 2 and 4 weeks after administration.

Methods: In a double – blind, randomized trial 2 to 10 years old children with OME who referred to ear, nose and throat clinic, were randomly assigned into two groups: Zinc group Placebo group. Children were examined by otoscopy and tympanometry at entry and after 2 weeks of treatment. For children who had not been cured completely after 2 weeks, treatment continued for more 2 weeks (total of 4 weeks).

Results: A total of 72 children were studied consisting zinc group 39 and placebo group 33 children. At the end of the first course of treatment (2 weeks) 72.1% of children in the zinc group had clinical improvement compared with 53.5% of children in placebo group. Tympanometrically, there was no statistically significant difference between two groups. There was no statistically difference between two groups at the end of second Course of treatment (4 weeks), too. But the response rate of zinc group was better than the placebo group (47.8 versus 16.5% clinically and 61.3 versus 45 tympanometrically) Zinc administration and cycles of treatment had not statistically significant relationship.

Conclusion: Although in this study oral zinc sulfate supplementation had not statistically effect on treatment of OME, the response rate was better in zinc group compared to placebo group specially for longer administration. According to the findings, it seems more studies about oral zinc supplementation in the treatment of OME is needed.

ESPID-0794

COMPLICATED URINARY TRACT INFECTIONS: ACUTE FOCAL BACTERIAL NEPHRITIS, PYONEPHROSIS AND RENAL ABSCESS

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Background/Aims: ?cute focal bacterial nephritis (AFBN), renal abscess and pyonephrosis are rare in children and little is known on their aetiology, presentation, imaging findings, management, and outcome.

Patients/Methods: We reviewed all episodes of AFBN, renal abscess and pyonephrosis in children hospitalised during the 10-year period 2003-2012 in a tertiary centre .

Results: Among 602 children with urinary tract infection (UTI), 21 had AFBN, 1 abscess and 3 pyonephrosis. All children (13 girls, 12 boys, aged 0.06-13.4 years) were febrile and admitted with impaired clinical condition. All underwent ultrasound investigation, 20 magnetic resonace urography and 5 computed tomography. Multiple and/or different lesions were confirmed in 12 episodes. Among the 21 AFBN episodes, 3 co-existed with pyonephrosis, 2 progressed to abscess and 1 relapsed. Urinary tract abnormalities were identified in 21/25 patients. Urine cultures grew *E. coli* (12), *P. aeruginosa* (8), *K. pneumoniae* (3), *P. mirabilis* (1), and *P. stuartii* (1), and were negative in 2 episodes. Antibiotics were administered for 2 weeks to 2 months. Acute surgery was required in 2 pyonephrosis and 1 abscess cases and corrective surgery in 13 patients during follow-up. 16 children progressed to permanent renal lesions.

Conclusions: AFBN, renal abscess and pyonephrosis often co-exist, were observed in 4.2% of children hospitalised for UTI and should be suspected in children with severe presentation and urological history. Ultrasound is helpful, but MRU seems to be the imaging of choice. Progression to scarring may occur despite appropriate management.

ESPID-0796

TUBERCULIN SKIN TEST AND INTERFERON-GAMMA RELEASE ASSAY IN A PROSPECTIVE STUDY OF WARAO AMERINDIAN CHILDHOOD TUBERCULOSIS CONTACTS

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Background:

Interferon-γ release assays (IGRAs) have emerged as a more specific alternative to the tuberculin skin test (TST) for the diagnosis of tuberculosis (TB) infection, especially in Bacille Calmette-Guérin (BCG) vaccinated children. Studies on IGRA performance in children from high TB burden low income settings are important to assess the need for the use of these costly and technically complex assays.

Methods:

From May 2010 to December 2011, 163 HIV-negative Warao Amerindian childhood TB contacts under 16 years of age were enrolled for TST, IGRA and Chest Xray (CXR) performance at inclusion and at 6 and 12 month follow up. TB Chemoprophylaxis is not prescribed in this area.

Results:

Of the 163 included children, 11 were diagnosed with active TB at inclusion and an additional 5 developed TB during follow-up. The negative predictive values for the development of active TB of the TST and IGRA were ≥97%. Positive predictive values were only ≤4%.

On inclusion, IGRA showed less positive results than the TST (42% vs. 47%). The concordance between IGRA and TST results was substantial (kappa>0.70) in both BCG-vaccinated and unvaccinated children. In multivariate analysis the presence of a BCG scar was not associated with TST positivity (Table 1).

Conclusions:

Replacement of TST by IGRAs is not recommendable in this resource constrained setting because a substantial concordance between the two tests was observed and TST results were not significantly influenced by previous BCG vaccination.

Table 1. Multivariate analysis TST and QuantiFERON®-TB Gold In-Tube (QFT-GIT) positivity		
Characteristics	**QFT-GIT positive vs. QFT-GIT negative**	**TST positive vs. TST negative**
	Odds ratio (95%CI)	**Odds ratio (95%CI)**
Age, years	0.99 (0.84-1.2)	1.4 (1.2-1.7)
Sex, male vs. female	0.6 (0.13-3.2)	3.7 (1.5-9.4)
Malnourished	4.6 (0.93-22.2)	0.92 (0.50-1.7)
BCG vaccination	0.51 (0.14-1.9)	0.68 (0.32-1.5)
Duration of exposure, ≥12 vs. <12 h/day	1.4 (0.35-5.65)	0.81 (0.34-1.9)

ESPID-0797

COMPARATIVE STUDY OF PHARMACEUTICAL EFFECT AND THERAPEUTIC TOLERANCE OF AMOXICILLIN AND CEFIXIME IN CHILDREN WITH ACUTE OTITIS MEDIA IN BORUJERD, IRAN

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Background: Proper and on time treatment of acute otitis media could prevent complications. Antibiotic

therapy has the principal role in treatment. In recent years, modalities of treatment are increasingly

become evidence based. This study was done to determine and compare the efficacy and therapeutic

tolerance of amoxicillin and cefixime in children with acute otitis media.

Materials and Methods: In a randomized clinical trial, 260more than 2 years children with acute otitis media were enrolled by simple convenient method. They were randomly divided in two groups, treated with amoxicillin or cefixime. Data were gathered by interview, observation, and tympanometery test and were analyzed via SPSS13 software.

Findings: The frequency of signs of acute otitis media after completing of drug therapy was not significantly different between the two groups. In the other words, the cure rate in two groups was equal. In regard to drug tolerance, there was not any significant adverse drug reaction in two groups but, only one patient among the amoxicillin group suffered from mild diarrhea.

Conclusion: Based on findings of the study, we can say that both drugs have the same efficacy and

tolerability. So in children have difficulty with oral drugs coping, an alternative antibiotic with longer

duration of half life such as cefixime can be the first line drug for treatment of acute otitis media.

ESPID-0798

BURDEN OF CONGENITAL CMV (CCMV) INFECTION IN CHILDREN WITH SENSORINEURAL HEARING LOSS (SNHL)IN NORTHERN-ITALY

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Introduction: Childhood sensorineural hearing loss (SNHL) is the most common defect among hearing impairments and congenital Cytomegalovirus (cCMV) infection plays a significant role in SNHL. Because CMV screening is not carried out and cCMV infections are largely asymptomatic, the identification of infected babies is difficult at birth.

Aim: To estimate cCMV infection frequency in pediatric subjects with SNHL and to describe their deafness characteristics. Therefore, correlation between cCMV and GJB2 gene alterations, encoding connexin 26 (cx26), was investigated.

Methods: From 1999 to 2013 a retrospective study was performed on 252 children with SNHL (≥20dB). Dried blood spot (DBS) specimens of 220/252 children were retrieved from the regional screening center in northern-Italy (Lombardia). CMV-DNA was extracted by thermal shock and amplified by nested-PCR (CMV-DBS test). In addition, information about the presence of GJB2 gene mutations were obtained for 108 babies.

Results: cCMV infection was detected in 31/220 (15%) children with SNHL. Deafness was found to be mainly bilateral (81%) and severe-profound (>70 dB; 71%). Finally, information about GJB2 gene mutations were retrieved for 16/31 cCMV: the co-presence of viral infection and genetic alterations was in 3 children (19%).

Conclusions: cCMV has a relevant role in the etiology of SNHL (15%);CMV-DBS test is able to detect viral DNA and to identify congenital infections retrospectively. Neonatal Hearing and CMV Screenings, carried out at the same time, would be an important strategy to early detect and correct hearing impairments.

ESPID-0799

THE HEALTHCARE SYSTEM AS A FACILITATOR AND BARRIER TO VACCINE ACCEPTANCE IN BOTSWANA: PUBLIC TRUST, COMMUNICATION AND VACCINE DELIVERY

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INTRODUCTION: Vaccine acceptance is a critical component of sustainable immunization programs, yet rates of vaccine hesitancy are rising. Increased access to misinformation through media and anti-vaccine advocacy is an important contributor to hesitancy in the U.S. and E.U. Little is known about the impact of access to negative media on attitudes toward vaccination in low and middle-income settings.

OBJECTIVE: To explore knowledge and attitudes regarding the immunization delivery system among caregivers and immunization providers in Botswana, a middle-income country, and to explore how misinformation impacts vaccine acceptance.

METHODS: We conducted focus groups with 33 providers and 22 caregivers in Gaborone, Botswana. Focus groups were conducted in Setswana or English, digitally recorded, and transcribed. Transcripts were translated into English, coded in qualitative data analysis software (NVivo 10), and analyzed for common themes.

RESULTS: Respondents reported high vaccine acceptance due to societal norms and trust in the healthcare system. Caregivers relied on healthcare providers and clinics for primary vaccine education and clarification of misinformation and negative media. However, participants cited features of the healthcare system that presented barriers to vaccination including inconsistent supply, time needed to obtain vaccines and travel difficulties.

CONCLUSIONS: In Botswana, caregivers and healthcare providers express overwhelming trust in the government and healthcare system. While there is increased access to misinformation, the majority of barriers to vaccination remain related to the vaccine delivery system. Trust in the healthcare system can be leveraged while addressing systems barriers to improve implementation of the immunization program.

ESPID-0800

RECURRENT WHEEZING AND ATOPIC ECZEMA ARE ASSOCIATED WITH INTESTINAL PROTOZOA AND MALNUTRITION IN WARAO AMERINDIAN CHILDREN IN VENEZUELA

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Background: High prevalence rates of helminth and protozoan infections are commonly found in children living in rural settings and several studies suggest an inverse association between helminth infections and allergies. No studies so far have investigated the relationship between helminths and protozoa and atopic diseases in rural children under 2 years of age.

Methods: From August to November 2012, 229 Warao Amerindian children aged 0 to 2 years were enrolled in a cross-sectional survey in the Orinoco Delta in Venezuela. Atopic eczema and nutritional status were assessed by standardized questionnaires and physical examination. A stool sample was requested from all participants.

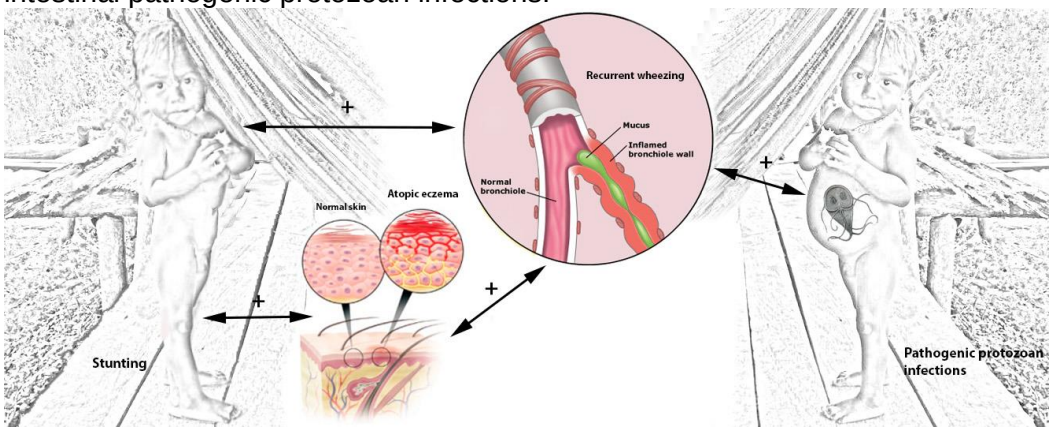
Results: Prevalence rates of atopic eczema and recurrent wheezing were high, respectively 19% and 23%. The prevalence of helminth infections was 26% and the prevalence of protozoan infections was 59%.

Stunting (chronic malnutrition) was positively associated with atopic eczema and recurrent wheezing in multivariate analysis (respectively p=0.043 and p=0.050).

Pathogenic protozoan infections were significantly associated with recurrent wheezing (OR 7.1, 95% CI 1.6-32.0) but not with atopic eczema. Helminth infections were not associated with either recurrent wheezing or atopic eczema.

Conclusions: High prevalence rates of atopic eczema and recurrent wheezing in Warao Amerindian children under 2 years of age were related to stunting and

intestinal pathogenic protozoan infections.



ESPID-0802

STILL HIGH – PERINATAL TRANSMISSION OF HIV IN HOUSTON, TEXAS

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Introduction and Aims

Despite great advances in the prevention of perinatal maternal to child transmission (PMTCT) of HIV, rates remain high in Houston, Texas. A previous retrospective study from 2000 to 2007 found an overall transmission rate of 6%. Risk factors for transmission included: inadequate prenatal care (PNC), failure to receive anti-retroviral therapy (ART) during pregnancy, and illicit drug use (IDU). We examined the transmission rates and transmission risk factors from 2007 - 2013.

Methods

Retrospective chart review of HIV-exposed infants and their mothers referred to the University of Texas-Houston Pediatric HIV Clinic from 2007 to 2013.

Results

Among 394 exposed infants, 14 acquired infection (3.6%). Most mothers did not receive PNC; only 14% were on ART during pregnancy. Almost all infants received zidovudine (AZT), however only half of the mothers received AZT during delivery; 50% had documented IDU.

N=14	PNC	cART During Pregnancy	AZT During Delivery	AZT to Infant	Cesarean Section	IDU
YES	5	2	7	13	6	7
NO	9	12	7	1	8	7
% Yes	36%	14%	50%	93%	43%	50%

Conclusions

Current recommendations for the prevention of perinatal HIV transmission should decrease the rate of PMTCT to less than 2%. Several recent studies from the USA and internationally report rates of 1.2 to 1.4%. The rate in Houston continues to be more than triple the USA average. Previously identified risk factors persist. As Texas continues to have one of the highest rates of uninsured pregnant women in the USA, access to prenatal care remains an important issue.

ESPID-0804

FIELD OF DREAMS 2.1 - IF YOU OFFER IT THEY WILL COME - UPTAKE OF LIVE ATTENUATED SEASONAL INFLUENZA VACCINE (FLUENZ)IN SCOTTISH 2 & 3 YEAR OLDS THE 2013/14 SEASON.

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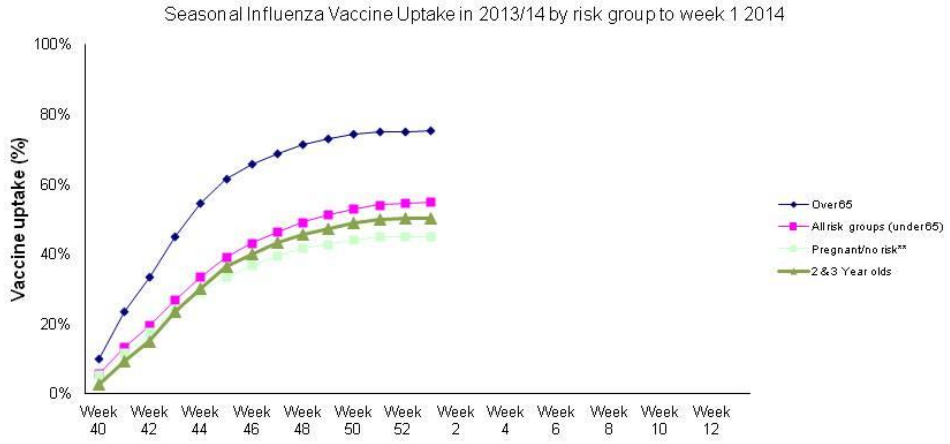
Introduction: in 2012 the Joint Committee for Vaccination and Immunisation recommended the phased introduction of seasonal influenza live attenuated intranasal vaccine (Fluenz) to all children. For the 2013/14 season Scotland implemented a national offer of Fluenz to all children aged 2 & 3 and a pilot offer of Fluenz in each health board area to Primary School age children - ages 4-11 inclusive - either in a limited number of whole schools or to single school year groups. Dependant on the administering location vaccination data was entered into the Scottish Child Health Systems Programme - Schools (CHSP-S) or primary care (PC) record respectively.
Objectives: Describe uptake by age, sex, socioeconomic status, ethnicity for children age 2 or 3.
Methods: National aggregated data submitted weekly with data validation by electronic data extraction from PC.
Results: Provisional all Scotland uptake in 2 & 3 year olds was 50.3% by week 1 of 2014. Uptake increased progressively across the season but is lower than the uptake observed across the other risk groups targeted by the vaccination programme.

Conclusion - The offer of Fluenz in this pilot in Scotland is reasonably well accepted by parents with good uptake but at lower levels than the other components of the vaccination programme. The results will inform Scottish Government Policy decision

for season 2014/15 and 2015/16.



ESPID-0805

SUCCESSFUL APPLICATION OF SELECTIVE DIGESTIVE DECONTAMINATION FOR ERADICATION OF CARBAPENEM-RESISTANT KLEBSIELLA PNEUMONIAE CARRIAGE IN NICU

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Introduction: The emergence of multidrug-resistant (MDR) Gram-negative Enterobacteriaceae has been increasingly described worldwide. The recovery of isolates with susceptibility only to polymyxins has led to the revival of colistin, which appears as the single therapeutic option. The emergence of metallo-b-lactamase (MBL)-producing pathogens since 2001 in Greek ICUs and especially of *Klebsiella pneumoniae* has resulted in excessive empirical use of colistin.

Objectives and aims: To describe the use of colistin for selective digestive decontamination (SDD) in an infant colonized with carbapenem-producing *Klebsiella pneumoniae* (KPC).

Methods: A full-term male neonate, born with normal delivery, was admitted in NICU for grunting. His perinatal history was uneventful but remained in NICU for social reasons. At 2 months of age, routine surveillance cultures revealed digestive colonization with KPC, susceptible only to colistin. Source was a pre-term neonate admitted to NICU for RDS, also previously colonized with KPC. Due to the high proportion of KPC-colonized intensive care patients who subsequently developed KPC infection reported in literature, SDD was administered. Regimen included orally administered colistimethate sodium and gentamicin for 2 weeks accompanied with probiotics. In addition, control measures, including cohorting and contact precautions were applied.

Results: After one week of SDD rectal surveillance cultures were negative. During the SDD course no adverse events were noted. Repeat cultures remained negative during a two-month follow up.

Conclusions: This is the first reported case of successful NICU SDD using colistin in an infant colonized with KPC. Due to the paucity of pharmacokinetic data, toxicities must be monitored closely.

ESPID-0806

INVASIVE FUNGAL INFECTIONS AND ANTIFUNGAL CONSUMPTION IN A PEDIATRIC TERTIARY CARE CENTER IN MONTREAL (CANADA)

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Background and aims

Pediatric patients hospitalised in our tertiary care center seem to be at increasing risk of fungal infections. This observation lead us to review the epidemiology of invasive fungal infections (IFI) in parallel with the anti-fungal drug consumption over a 12 year period.

Methods

Hospitalized patients between 2000 and 2012, who received antifungal medication, were included. Antifungal agent consumption (defined daily dose/1000 patient-days (ddd-p) was obtained from the pharmacy database. Strains isolated from normally sterile sites were identified from the microbiology database.

Results

Among the 374 fungi isolated idemtified as a cause of IFI, yeasts represented 88.5 % (*Candida albicans*: 48.9 %- and susceptibility to Fluconazole: 100 %) and molds 11.5 % (*Aspergillus* species: 48.8 %). A 1.7 fold increase in the number of non-*albicans Candida* was observed during the 12-year study period.

Globally, we observed a 2.5-fold increase in the overall ddd-p, from 24.6 in 2000 to 60.9 in 2012. Among the antifungals prescribed in 2012, Fluconazole represented 49.5 %, Caspofungin 24.2 %, Voriconazole 16.6 %, Amphotericin-B (including liposomal formulation) 5.6 % and Posaconazole 1.2 %. In comparison with the year 2000, this represented a variation of + 6.4 for Caspofungin, + 6.4, + 1.6 for Voriconazole and – 1.8 for Amphotericin-B.

Conclusions

Over the study period, we observed an increase in the overall consumption of antifungal agents, particularly of the echinocandin class. . This could be explained by an increased rate of IFI in our population as well as the emergence of infections caused by non-*albicans Candida.*

ESPID-0807

COMMUNITY ACQUIRED PNEUMONIA ETIOLOGY STUDY (CAPES)- EXPERIENCE OF 3000 CASES FROM A SINGLE CENTRE IN INDIA

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Introduction: Confirmation of microbiologic etiology in childhood community acquired pneumonia(CAP) is essential for evidence-based therapeutic and prophylactic policies.

Objective: To identify microbiologic etiology in children with CAP.

Methods: Children with WHO-defined pneumonia were prospectively enrolled through community and hospital-based surveillance. All children underwent blood and nasopharyngeal aspirate(NPA) cultures. Additionally, broncho-alveolar lavage(BAL) culture and multiplex PCR analysis were done in those intubated for severe disease.

Results: 3000 children were enrolled; 10.8% were <2months, 46.6% were 3-12 months, 32.5% were 13-60 months, and 10.1% were 61-144 months. Figure 1 presents age and severity distribution. Predominant blood culture isolates (n=63;2.1%) were Staphylococcus aureus(43), Pneumococcus(11), and Gram negative bacilli (Klebsiella, Salmonella, Pseudomonas, and E.coli). NPA cultures (n=399;13.3%) yielded Pneumococcus(338), Haemophilus influenzae(29), Staphylococus aureus(23) and Gram negative bacilli(9). BAL samples were available in 52 children. Culture identified organisms in only 7 cases (Staphylococcus aureus-3, Acinetobacter-2, Pneumococcus-1, Enterobacter-1). However, multiplex PCR revealed organisms in 52 of 53 samples(Figure 2). Four samples yielded a single organism; 3 CMV and 1 Staphylococcus. 48 samples showed multiple organisms including Pneumococcus(36), Haemophilus(11), Staphylococcus(10). 7 samples yielded viruses including CMV(5), Adenovirus(1) and Parainfluenza virus(1). One sample had no organism.

Conclusion: Bacterial culture identified etiology in <15% childhood CAP. Staphylococcus aureus was predominant in blood and BAL. Multiplex PCR in BAL

samples identified multiple organisms in nearly all cases.

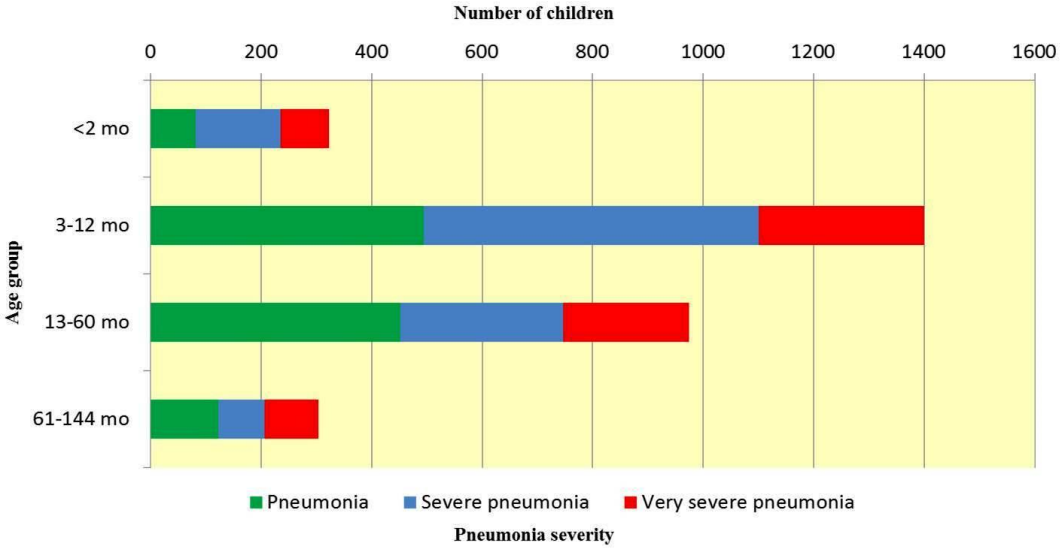

Figure 1: Distribution of children with CAP by age-group and pneumonia severity.

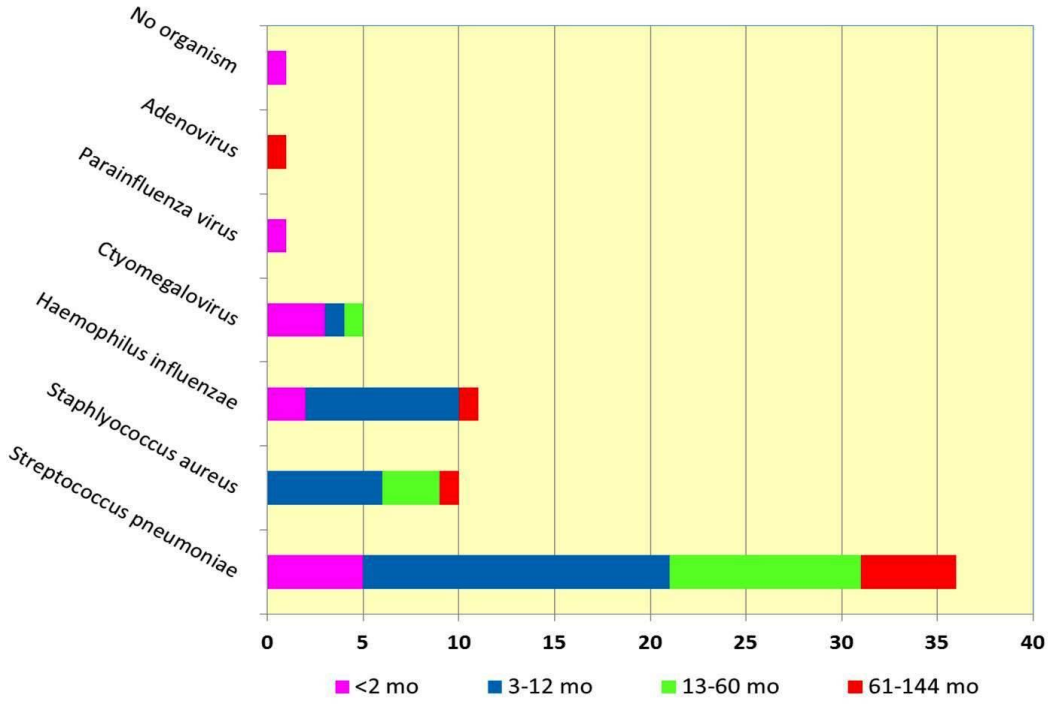

Figure 2: Organisms identified by Multiplex PCR in BAL samples.

ESPID-0809

AN EARLY REDUCTION OF ACUTE OTITIS MEDIA AND PNEUMONIA IN CHILDREN IN ICELAND FOLLOWING PCV-10 IMMUNIZATION

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Introduction: Pneumococcal conjugate vaccine immunization (PCV-10) in children was included in the Icelandic childhood vaccination program in 2011, a population not earlier vaccinated against pneumococci.

Aim: To determine the effect of pneumococcal conjugate vaccine immunization on hospital visits and admissions for pneumonia or acute otitis media (AOM) in children.

Methods: Children <2 years of age with pneumonia or AOM that visited or were admitted to The Children's Hospital from January 1st 2008 to December 31st 2013 were enrolled. The mean annual incidence/1000 children <2 years of age was found, children born in 2011 (vaccinated group:VG) were compared to children born in 2008-2010 (unvaccinated group/comparison group:CG) using likelihood ratio test and odds ratio and confidence interval. The number of children with bronchiolitis was also used for comparison.

Results: For AOM, the mean annual incidence was significantly lower in the VG (87) compared to the CG (108) (OR(95%CI): 0.76;(0.67-0.85), p<0.001). For pneumonia, the mean annual incidence was also significantly lower in the VG (29) compared to the CG (39) (OR(95%CI): 0.74;(0.61-0.88), p<0.001). The incidence of acute bronchiolitis was significantly higher in the VG (30) compared to the CG (39) (OR(95%CI): 1,36;(1,12-1,59), p<0.001).

Conclusion: The reduction in the number of children with pneumonia and AOM confirms our earlier results, now with a longer follow up period. These results are even more interesting considering the higher incidence of bronchiolitis in the follow up period of the VG that might predispose to AOM or pneumonia. These results clearly demonstrate the effect of the PCV-10 vaccination.

ESPID-0810

POSACONAZOLE MONITORING IN IMMUNOCOMPROMISED CHILDREN

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Background and aims

Information regarding the use of posaconazole in pediatric patients is limited and no dosage recommendation has been defined. The aim of this study was to determine if current dosage used in our patients achieve posaconazole concentration greater than 0.7 and 1 mg/L respectively.

Methods

Pediatric patients who underwent hematopoietic stem cell transplantation (HSCT) or intensive chemotherapy between January 2007 and November 2013 were included if they received posaconazole treatment and had at least one plasma concentration measurement. Patient characteristics, biological and clinical data (underlying disease, gastrointestinal disorders, comedication, and therapeutic drug monitoring) were collected for retrospective analysis.

Results

We identified 16 children and young adults with a median age of 8.3 years (range 1.1-19.9) who received posaconazole therapy for proven (4 patients) invasive fungal infection (IFI) or prophylaxis (12 patients). 15 patients underwent HSCT and leukemia was the most common underlying condition (56 %). Posaconazole was administered at a median initial dose of 14 mg/kg/day (range: 10.8-20.9). At their first measurement, 8 patients (50 %) had posaconazole concentration higher than 0.7 mg/L (median = 0.66 mg/L, range: 0-2.1) and only 3 patients achieved concentration above 1 mg/L. No patient developed progressive IFI and no IFI occurred when prophylactic treatment was administered.
The most common treatment-related toxicity was increased liver function enzymes.

Conclusions

Posaconazole administered at a dose of 14 mg/kg/day frequently results in suboptimal trough concentration. A variability of posaconazole pharmacokinetics was observed suggesting that posaconazole therapeutic drug monitoring remains essential to ensure adequate exposure.

ESPID-0811

DIAGNOSTIC VALUE OF PROCALCITONIN FOR DETECTION OF SERIOUS BACTERIAL INFECTIONS IN FEBRILE INFANTS LESS THAN 3 MONTHS OF AGE

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Aim: To assess performance of procalcitonin (PCT) for identifying serious bacterial infection (SBI) and invasive bacterial infection (IBI) in febrile infants younger than 3 months without an identifiable bacterial source.

Method: a prospective multi-centric observational study included children aged, 7 to 92 days with fever of unknown origin admitted to 15 French pediatric emergency departments. A final diagnosis (SBI, IBI or not bacterial infection) was established. Serum samples were collected on admission for quantitative PCT determination.

Results: PCT and C-reactive protein (CRP) values were known in 2047 infants. Twenty-one children (1%) had IBI (bacteremia, n=13; meningitis, n=8) and 124 (6%) had SBI (urinary tract infection, n=115; others, n=9). The areas under receiver operating characteristic curve (AUC) for PCT and CRP were 0.76 (95% CI 0.71-0.80) and 0.78 (95% CI 0.74-0.82) among patients with SBI, respectively. In the 21 children with IBI, the AUC for PCT (0.92, 95% CI 0.85-0.99) was higher than that for CRP (0.80, 95% CI 0.69-0.91). The optimal cut-off points for PCT and CRP in detecting overall bacterial infection were determinated at 0.3 ng/ml and 20 mg/L, respectively. Negative likelihood ratios for PCT < 0.3 ng/mL and CRP < 20 mg/L were 0.11 (95% CI 0.03–0.44) and 0.30 (95% CI 0.14–0.65) in patients with IBI, respectively. PCT <0.3 ng/mL almost ruled out IBI (post-test probability of disease 0.1%).

Conclusion: PCT diagnostic properties were similar than those of CRP for identifying SBI in febrile infants ≤ 3 months. PCT performs better than CRP in detecting IBI.

ESPID-0812

DIPHTHERIA OUTBREAK IN INDONESIA: A THREE YEAR REPORT

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Introduction : Since 2011 Indonesia suffered from diphtheria outbreak in East Java Province. Various efforts have already been done to solve the problem but until this year the outbreak continues.

Objective : To present the report of three year surveillance of diphtheria outbreak in East Java Indonesia

Methods : This report was based on surveillance data collected at East Java Provincial Health Office from all 38 districts since January 2011 until December 2013. The data sources were the district hospitals, provincial hospitals, the local health officers, the family of the patients, and the contacts. Microbiology data were collected from 2 main laboratories in Surabaya and Malang.

Results : From 2011, there were 2226 cases reported from 38 districts (100%), with the highest annual number was in 2012 (955). Two outbreak response immunization programs were performed in 2011 and 2012 and in 2013 the number of patients decreased. Although the patients were mostly below 15 years old (1226, 56.42%), the trend showed the increasing number of adults. Most patients were unimmunized or partially immunized during the infant period (1910, 85.8%). Microbiology examinations discover toxigenic *Corynebacterium diphtheriae* in only less than 15% of patients indicating possible high number of overdiagnosis cases.

Conclusions : Since 2011, there was a diphtheria outbreak in East Java Indonesia. The highest number of patient was recorded in 2012. The positivity rate of microbiology culture was low. Despite many actions in affected area, until this year the outbreak cannot be stopped.

Keywords : *diphtheriae outbreak, East Java Indonesia*

ESPID-0814

APPLICATION OF THE NEW CDC VENTILATOR-ASSOCIATED EVENT (VAE) MODULE AND CRITERIA IN CRITICALLY ILL CHILDREN

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Background. Ventilator-associated pneumonia (VAP) is common health-care associated infection in pediatric ICU (PICU). However, a definite diagnosis of VAP remains controversial.

Aim: To evaluate the new CDC module and criteria for VAE in critically ill children and compare it with the traditionally used VAP definition.

Methods. New CDCVAE module was used in this study conducted in a PICU for 1 year. This module is based on objective and potentially automatable criteria and includes 3 definition tiers [Ventilator-associated condition (VAC), infection-related ventilator-associated complication (IVAC) and possible/probable VAP]. Results of this new evaluation were compared to standard CDC criteria for clinically defined VAP (CDVAP, which requires both radiographic findings and symptoms of pneumonia) in children using the kappa co-efficient score. All patients were independently assessed for these two CDC criteria.

Results. Among 127 children admitted to the PICU (PRISM 24, md 8, range 8-35), 119 (94%) received mechanical ventilation (md 7 days, range 1-183). According to new CDCVAE module, 12 patients (10%) were classified as possible/probable VAP, whereas 2 as IVAC and 5 as VAC. According to CDC standard criteria during the same period, 13 patients (11%) were classified as CDVAP. Only 5 patients were classified by both algorithms to have VAP. Agreement between the two CDC sets of criteria was moderate (Kappa co-efficient: 43%).

Conclusions. This is the first study utilizing the new CDC VAE module and criteria in children. Although both CDC criteria for VAP surveillance found similar prevalence, a significant discordance exists between them.

ESPID-0815

UNCOMMONLY SEVERE GASTRO- INTESTINAL INFECTIONS IN CHILDREN CAUSED BY ROTAVIRUS

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Uncommonly severe gastro- intestinal infections in children caused by rotavirus

Background. Rotaviruses are the most common cause for viral gastro- intestinal diseases in children (average age 6 months- 2 years). Infections include both subclinical and severe causes. Treatment is based on the leading symptoms as no specific anti- viral treatment exists. While most clinical causes are self- limiting, severe complications can oc

Methods. The cases described refer to 5 patients (2 female, 3 male), aged between 1 and 3 years at the time of examination. Observation period was April/ May 2012, the average in- patient treatment was 12,5 days. During observation period several laboratory tests (hemoglobin, white blood cells, platelets, CRP), stool samples and blood cultures were examined.

Results. Rotavirus could be detected in all stool samples. After initial uncomplicated causes, a secondary aggravation in all patients with proof of a secondary bacteraemia could be detected. We identified: Serratia marcescens, Klebsiella, Pantoea agglomerans, Streptococcus sanguinis. A targeted antibiotic treatment led to a sudden consolidation.

Conclusion. Gastro- intestinal infections in children caused by rotavirus can lead to uncommonly severe, even septic, clinical causes, due to secondary bacterial inflammation. The underlying pathomechanism is yet to be detected, a possible reason could be an increased vulnerability of infectiously damaged enterocytes and consequently a facilitated bacterial invasion. In case of germ detection an antibiotic treatment is inevitable.

ESPID-0816

CORROBORATING THE EFFECTIVENESS OF PCV7/PCV13 VACCINATION PROGRAM AMONG CHILDREN AGED LESS THAN 5 YEARS, PUGLIA, ITALY, 2006-2012

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Background and aims

Pneumococcal disease epidemiology has changed after introduction of pneumococcal conjugate vaccines. In Puglia region (South-East Italy), PCV7 was introduced in 2006 with a 2+1 doses schedule within the first year of life. In 2010, PCV13 replaced PCV7 and, already in the same year cohort, vaccination coverage had reached 95.1%. Estimation of PCV7/PCV13 vaccination effectiveness against IPD in hospitalized children ≤60 months is 84.3% (95%CI: 84.0–84.6%) with the screening method. We corroborated the estimation of vaccine effectiveness (VE) in preventing severe pneumococcal diseases in children.

Methods

We conducted a 1:3 matched case-control study. A case was a child resident in Puglia, born between January 2006 and June 2012, hospitalized (when aged at least 6 months) for IPD or pneumococcal pneumonia between June 2006 and December 2012. A control was a matched (by age and residence) healthy child retrieved from the general population registry. We used conditional logistic regression to compute outcome specific ORs for complete schedule of PCV (PCV7/PCV13). We calculated overall and outcome specific VE as 1-OR, with 95% confidence intervals.

Results

We recruited 39 (nine IPD and 30 pneumococcal pneumonia) cases and 117 matched controls. Cases' median age was 32.7 months (range 7-59). Overall PCV7/PCV13 vaccination program effectiveness was 86.4% (95%CI: 57.3-97.5%). It was 83.4% (95%CI: -83-98.5%) and 87.2% (95%CI: 52.6-96.5%) against IPD and pneumococcal pneumonia respectively.

Conclusions

PCV vaccination program confirms its effectiveness against the most severe cases of *S. pneumoniae* disease among children aged <5 years.

ESPID-0817

FUNCTIONAL ANTIBODY RESPONSES FOLLOWING 10-VALENT PNEUMOCOCCAL CONJUGATE VACCINATION WITH EITHER A TWO-DOSE PRIMING WITH BOOSTER OR THREE-DOSE PRIMING SCHEDULE WITHOUT A BOOSTER IN NEPALESE INFANTS

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Background: Use of pneumococcal conjugate vaccines in resource poor countries is skewed towards early infant immunisation with little emphasis on protection in late infancy. However in the Kathmandu Valley, Nepal the majority of invasive pneumococcal disease due to vaccine serotypes occurs beyond 9 months of age.

Methods: A randomized, open-label, controlled trial was conducted in healthy infants aged 40-60 days from the Kathmandu Valley, Nepal. Participants were randomised (4:4:5) to receive PCV10 in addition to routine immunisations either as a two dose prime and booster (2+1), three dose priming (3+0), or two doses following completion of the initial study phase (0+2). Sera collected at 18 weeks and 10 months of age were analysed for pneumococcal opsonophagocytic activity of all vaccine serotypes using a HL60 cell line dependent killing assay.

Results: Between June 2010 and November 2011, 390 children were randomised; 119 to 2+1 group, 120 to the 3+0 group, and 151 to the 0+2 group. No significant differences in opsonophagocytic activity, between the 2+1 and 3+0 groups were noted at 18 weeks. However the 2+1 group had significantly higher proportions of opsonophagocytic activity titre ³8 at 10 months compared to the 3+0 group for serotypes 1, 4, 5, 6B, 18C, 19F and 23F.

Conclusions: Application of a two dose priming schedule of pneumococcal conjugate vaccine with a booster dose at 9 months of age, provides improved functional antibody responses in late infancy without compromising responses generated in earlier infancy.

ESPID-0818

THE ACCURACY OF MULTIPLEX-PCR IN THE DIAGNOSIS OF BLOODSTREAM INFECTIONS IN NEONATES AND INFANTS AGED LESS THAN 90 DAYS

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BACKGROUND AND AIMS

Bloodstream infections are a significant healthcare burden, especially in newborns and infants. Rapid pathogens identification and prompt targeted antimicrobial treatment may be critical to improve patients outcomes. Traditional culture methods often requires 24–72 h. Molecular techniques, such as Polymerase Chain Reaction (PCR), may offer a solution to the problems associated with culture-dependent methods, being completed in less than 12 hours.

METHODS

The study was conducted in a Paediatric Hospital in Rome. Samples from newborns and infants aged less than 90 days hospitalised during 2012 with clinical sepsis were analysed by both blood culture (BC) and multiplex-PCR LyghtCycler SeptiFast®.

RESULTS

297 episodes were evaluated. Excluding 24 contaminants, 86 samples gave positive results at least in one method (29%). 35 pathogens were detected by both whereas in 7 cases the results were discordant. In 5 samples, 1 S. aureus, 2 K. pneumoniae, 1 E. coli and 1 Enterococcus faecium were cultured but not detected by PCR. In 39 culture-negative samples SeptiFast identified a bacteria; 46% out of these were from patients already receiving antibiotics. Excluding contaminants, the rate of positive samples was significantly higher by SeptiFast (n=81/273, 30%) than BC (n=47/273, 17%).

CONCLUSION

This study suggests that SeptiFast increases the sensitivity of BC, and can be used in conjunction with, but cannot replace, culture-based methods to better diagnose bloodstream infections in neonates and infants. Prospective multicentre studies are required to confirm these results and allow the development of new algorithms for the diagnosis of sepsis in these critical children.

ESPID-0819

2013/14 PRE-SEASON SUSCEPTIBILITY OF THE SCOTTISH PAEDIATRIC POPULATION TO INFLUENZA ILLNESS TO INFORM PUBLIC HEALTH POLICY

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Introduction : A pre-season population based serological study was undertaken in Scotland in 2013 prior to the introduction of an extended childhood influenza vaccination programme.

Objective : To determine influenza illness susceptibility in the paediatric population (under 15 years of age) and likely impact of anticipated influenza strains in this population in the 2013/14 influenza season.

Method : Residual blood/serum samples were collected by laboratories representative of the main population areas in Scotland during July to September 2013. Samples were tested using a haemagulutinin inhibition assay (1:40 dilution) against a panel of influenza A and B strains in the recommended 2013/14 trivalent and quadrivalent influenza vaccines. Binomial analysis and logistic regression were used to determine differences in sero-positivity rates due to age group, gender, region and specialty.

Results: Influenza positivity rates varied by strain, age group, region and specialty but not by gender ($p<0.05$). Influenza B Victoria Brisbane (strain in the quadrivalent vaccine) positivity rates were significantly lower (7.3-31.5%) than Influenza A H3N2 Texas (43.0-63.4%), Influenza A H1N1 (2009) (53.3-69.4%) and Influenza B Yamagata Massachussets (45.1-61.2%), the strains contained in the trivalent vaccine.

Conclusion: Results suggest a significant proportion of the Scottish paediatric population is likely to be susceptible to influenza illness in the 2013/14 season depending on the effectiveness of the trivalent vaccine and the dominant influenza strain. In light of potentially high susceptibility to Influenza B Victoria Brisbane illness, future consideration of the appropriate use of quadrivalent vaccine in the paediatric population, particularly those with underlying health conditions, is crucial

ESPID-0821

EFFECT OF CORD BLOOD CYTOKINE PRODUCTION ON FREQUENCY OF RESPIRATORY INFECTIONS AND INFECTIOUS SYMPTOMS DURING THE FIRST YEAR OF LIFE

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Background and aims Respiratory infections are frequent during early childhood hence the understanding of the factors affecting the frequency of these infections is important. We studied the association between cytokine production in cord blood and the frequency of respiratory infections and infectious symptoms during the first year of life.

Methods The study population consists of 577 children from Austria, Finland, Germany and Switzerland who are participants of prospective international birth cohort study (PASTURE: Protection against Allergy – study in Rural Environments) and a Finnish extension (n=197) of the study group followed with the same extensive protocol. Whole-blood samples were collected after birth and stimulated for 24 hours with lipopolysaccharide or with combination of phorbol ester and ionomycin (P/I), or 48 hours with Staphylococcal enterotoxin B. Production of IL-5, IL-10, TNF-alpha and IFN-gamma were determined by using ELISA. The information about infection frequency was received from weekly diaries filled in during 44 weeks from 9th postnatal week onward.

Results Children with detectable production of P/I stimulated IL-5 (aRR 0.40, 95% CI 0.28-0.56) and IFN-gamma (aRR 0.48, 95% CI 0.21-0.72) had less frequently middle ear infection than children with production under detection limit.

Conclusion During the first year of life, middle ear infection seems to be less frequent with children having detectable T cell responses in cord blood.

ESPID-0823

USE OF TIGECYCLINE IN CRITICALLY ILL PEDIATRIC PATIENTS WITH INFECTIONS DUE TO EXTENSIVELY DRUG-RESISTANT GRAM NEGATIVE BACTERIA

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Background and aims: Emergence of extensively drug-resistant organisms (XDRO) has forced clinicians to use off-label antimicrobial agents. Very little is known about safety and efficacy of tigecycline use in pediatric patients.

Methods: Retrospective chart review conducted in an 8-bed polyvalent pediatric intensive care unit from 2009 to 2013. Patients were identified using pharmacy archives.

Results: Ten children (6 males) with median age 8.5yr (range 1-14yrs) received tigecycline for ≥1d as treatment of health care-associated infections including 4 bacteremias, 4 lower respiratory tract infections and 2 other infections. The isolated pathogens were XDROs and included *Acinetobacter baumannii* (6 patients), *Klebsiella pneumoniae* (2 patients) and *Serratia marcescens* (1 patient). All isolates were sensitive to tigecycline and to one (5/9 isolates) or two (4/9 isolates) additional antimicrobial agents (mostly colistin). Tigecycline administration was targeted in 7 cases and empiric based on patients' colonization in 3. A loading dose (usually 2-4mg/kg) was given in all but one case. Maintenance dose was given at 1-4mg/kg q12h. The median duration of tigecycline administration was 12.5 days (2-26 days). Other antimicrobials, including colistin and aminoglycosides (80% and 50%, respectively), were co-administered to all patients. No severe adverse event was detected in these seriously ill children. Clinical and microbiological improvement was observed in 6/10 patients.

Conclusions: Tigecycline does not appear to induce short-term adverse events in critically ill pediatric patients. More data are needed to evaluate its efficacy and both short- and long-term adverse events in children.

ESPID-0824

IMPROVING CLINICAL STATUS OF PERINATALLY HIV-INFECTED PATIENTS AT TRANSFER TO ADULT CARE OVER TIME IN THE UK & IRELAND

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Background: Increasing numbers of perinatally HIV-infected (PHIV) children survive and transfer to adult care.

Methods: We analysed prospective cohort data from the Collaborative HIV Paediatric Study (CHIPS) in the UK/Ireland. Clinical and treatment status at last clinic visit prior to transfer were described, the effect of calendar year on CD4 cell count and viral load (VL) suppression<400c/mL at transfer were assessed using linear and logistic regression.

Results: Of 1,731 children followed-up from 1996-2013, 498(29%) transferred to adult care: 58% were born abroad and 76% were black African; 11% transferred in 2000-04, 37% in 2005-09, and 52% in 2011-13. At transfer, median age was 17.4 years [16.5-18.1]; CDC stage was B in 32% and C in 27%; 49(10%) were ART-naïve, 120(32%) on their initial HAART regimen, 226(43%) on subsequent HAART regimen, and 74(14%) were off-ART.

Median CD4 at transfer was 444 c/mm^3 [274-648]: 16% had CD4<200, 18% had 200-349, 23% had 350-499 and 43% had ≥500. The proportion with CD4 <350 c/mm^3 decreased over time: 55% in 2000-04, 40% in 2005-09, to 27% in 2010-13, while proportion of patients on ART with VL<400c/mL increased from 36% to 60% to 66%, respectively (p=0.001). In multivariate analyses, CD4 and VL suppression at transfer improved significantly over time, after adjusting for country of birth, age at ART initiation and treatment status(p=<0.02).

Conclusion: At transfer to adult care, one-third of PHIV had CD4<350 c/mm^3, although CD4 and VL status improved over time. Data on long-term outcomes in adult care are needed to inform clinical care.

ESPID-0825

USE OF A NEW 4 COMPONENT MENINGOCOCCAL SEROGROUP B VACCINE (4CMENB), TO CONTROL AN OUTBREAK OF INVASIVE MENINGOCOCCAL DISEASE (IMD)

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In January 2013, the European Medicines Agency approved a 4CMenB vaccine for prevention of meningococcal serogroup B disease. We report on its use to control an unusual cluster of invasive meningococcal disease (IMD) in an extended family in Ireland.

Between March 2010-November 2013 eight laboratory confirmed IMD serogroup B cases were identified in an extended family. Cases were aged 5-46 months, all were hospitalised and one suffered long-term sequelae. Chemoprophylaxis given to relevant nuclear family members and contacts on each occasion failed to prevent further cases.

Meningococcal isolates from six cases were the same multi-locus sequence typing (MLST) type (ST 41/44) and porA type (7-2,4).

In November 2013, the outbreak control team recommended that directly observed chemoprophylaxis be given simultaneously to the extended family network, and that 4CMenB vaccine be administered to family members aged 2 months to 23 years inclusive. We estimate vaccine coverage to be 68% in Ireland. In December 2013 family members attended clinics where; pharyngeal swabs were taken to assess carriage rates of *N. meningitidis,* chemoprophylaxis was given, and at one clinic, 4CMenB vaccine was administered to 29 family members. Active surveillance detected six sore arms (21%), as the only adverse reactions to date.

Pharyngeal carriage of *N. meningitidis* was detected in 13% of family members. This proportion is similar to that of the general population suggesting that social/housing circumstances increased the vulnerability of this group to meningococcal infection. Wider use of this vaccine for people living in similar social settings needs to be explored.

ESPID-0826

EPIDEMIOLOGIC TREND IN TEN YEARS OF CONGENITAL SYPHILIS IN A TERTIARY HOSPITAL

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OBJECTIVES: To describe the epidemiological trend in children exposed to syphilis in pregnancy and their mothers.

METHODS: A retrospective and analytical evaluation of 288 children exposed to syphilis, treated at the Hospital de Clínicas–Curitiba, PR, 2000-2010.
RESULTS: The mean maternal age was 26.7 years, with 17.5% of cases in girls under 20 years. The diagnosis of syphilis in pregnancy happened prenatally in 90.3% of cases. The number of single women without prenatal care was 7.8 times greater than that of married women. Unable to determine the onset of the disease in mothers in 92.3% of them. Pregnant women with adequate treatment accounted for16.6%. Inadequat treatment corresponded to59.8%. Pregnant without treatment, 20.5%.The most disturbing fact was that 57% of cases dropped to keep the child.The children had no symptoms in 92.7% (n= 267), were considered small for gestational age in 15.6% (n= 45), pre-term in 19.8% (n= 57). Dropped 26.4% (n= 76) and 71.2% (n= 205) likely congenial syphilis.

CONCLUSIONS:The earlier the diagnosis and treatment there is, the greater the possibility of limiting the occurrence of congenital syphilis. To do this, arrange the inclusion of pregnant women in prenatal care, with proper medication mainly for the sexual partner. Enumerating as risk factors for pregnant women with less than 20 years, cases of co-infection, unmarried women and mothers with low education levels. Describe the consequences to the newborn, with priority to care if the baby is exposed to congenital infectious diseases.

ESPID-0827

ACUTE MASTOIDITIS IN CHILDREN - A 16-YEAR RETROSPECTIVE STUDY

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Introduction: Acute mastoiditis affects 1/400 cases of acute otitis media being its main complication. Although improvement of health care conditions decreased its importance, recent studies describe a gradual increase in its incidence.

Objectives: Analyse the cases of acute mastoiditis in a pediatric population. Assess acute mastoiditis approach in two distinct periods of time in the same Department of Pediatrics.

Methods: Case review of children admitted with acute mastoiditis in a general hospital from June 1996 to May 2013. Compare clinical, diagnostic and therapeutic data in two distinct periods (June 1996-May 2005 and June 2005-May 2013).

Results: There were 135 cases, 60% males and 89,6% caucasians. Fifty-three children had a previous history of hear, nose and throat disease and upon admission 33,3% were under antibiotic treatment. Fever (68,9%) and otalgia (55,6%) were the most frequent complaints.
Complications occured in 22,2% children (thirty extracranial and 5 intracranial) and were associated with higher leukocyte count (p=0,046) and higher C reactive protein (p=0,001) at admission.
In the last years there were more complications (19% vs 24,7%), an increase in the exams performed (CT Scans p=0,001; myringocentesis p=0,007) as well as in length of hospitalization (p=0,001) and length of antibiotic therapy (p=0,001).

Conclusions: Although acute mastoiditis diagnosis is essentially clinical, laboratory tests like leukocyte count and C reactive protein are important, since there is an association between higher values at admission and complications. Over the years there has been an increased in diagnostic exams performed as well as in length of antibiotic therapy and hospitalization.

ESPID-0828

PYOMYOSITIS MAY NOT BE AN UNUSUAL OCCURRENCE IN CHILDREN FROM NON TROPICAL AREAS

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Background and aims: Pyomyositis is a severe purulent infection of skeletal muscle typically presenting in tropical countries.

Methods: Retrospective study set at the University Hospital Virgen del Rocío Chidren in Seville during 2008-2013.
Results: A total of 5 of children (3 female, median age of 5 years and range 1 to 9 years) were identified. Site of infection involved the thighs in all cases. Four patients had a previous history of blunt trauma, 2 cases had a recent history of varicella infection and another two children suffered from atopic dermatitis, Clinical presentation included fever, pain, swelling and limp that had been present a median of 48 hours (range 24 to 120 hours) before diagnosis. All cases presented with elevation of reactive C protein (mean 218 mg/l ± 136 mg/l) and neutrophilia (mean 5974/mm3± 67,8/mm3) and serum creatine kinase was elevated in 3 cases (mean 351,6 U/l.± 228 U/l) Etiological diagnosis was established in 3 patients (methicillin-sensitive *Staphylococcus aureus* (2), *Streptococcus pyogenes* (1)). MRI disclosed adjacent bone involvement in two children. All the cases were managed with intravenous antibiotics (median 14 days (range 4 to 95days) followed by oral antibiotics (median 21 days ; range 8 to 37 days). Surgical drainage were performed in 3 cases. All but one patient made a full recovery, who had a recurrence and required long term antibiotics.

Conclusions: Pyomyositis in children is increasingly recognized in temperate areas. Early diagnosis and an appropriate management including surgical drainage and directed antibiotic therapy are important in order to avoid severe complications.

ESPID-0831

EVALUATION OF HUMAN ENTEROVIRUSES (HEVS) PREVALENCE IN HOSPITALIZED CHILDREN AGED 0-5 YEARS

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Introduction: Human enteroviruses (hEVs) belong to *Picornaviridae* family. The clinical manifestations of hEVs infections vary, ranging from mild gastrointestinal/respiratory illness and aseptic meningitis to serious symptoms such as myocarditis, encephalitis, acute flaccid paralysis, and severe neonatal sepsis-like disease.

Aim: To evaluate the prevalence of hEVs infections in children (0-5 years) hospitalized in 2011-2013 in Milan.

Methods: 127 stool specimens were collected from as many children hospitalized for a variety of clinical manifestations (ranging from mild gastrointestinal/respiratory illness to serious symptoms). RNA was extracted by a commercial kit (Invitrogen) and an in-house multiplex one-step real-time RT-PCR was performed to simultaneously detect hEVs and human Parechovirus (hPeVs) genome.

Results: Prevalence of hEVs was 30%, being hEV-RNA detected in 38/127 clinical samples. HPeV-RNA was identified in 4/127 (3%) samples. Interestingly, hEV-RNA was present in 39.5% (15/38) of patients who reported neurological symptoms: mean age of hEV-positive children with neurological symptoms was 5 months (range: 3 days-3 years; median age: 16 days). In 4/15 (26.7%) of these hEV-positive patients other clinical symptoms (gastrointestinal and/or respiratory) were present too. The remaining 23 (23/38: 60.1%) hEV-positive children reported other symptoms such as sepsis, cardiac damages and acute hepatitis.

Conclusion: This study confirmed the high prevalence of hEV in hospitalized children aged 0-5 years. About 40% of hEV-positive children had neurological symptoms. Enterovirus investigation by molecular methods should be considered in pediatric disease with suspected viral infection, and, particularly, in neonates with neurological symptoms.

ESPID-0832

AN AUDIT INVESTIGATING THE MANAGEMENT OF INFANTS AT RISK OF VERTICAL TRANSMISSION OF HEPATITIS B/C AT ST. GEORGE'S HOSPITAL, LONDON

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Objectives: Investigate the initial and long-term management of infants born to mothers with chronic hepatitis B (HBV) and/or hepatitis C (HCV) infection.

Methods: A retrospective audit was conducted of all infants born at St. George's Hospital between 2000-2007 whose mothers tested positive for HBV or HCV. A standardised questionnaire was developed and the following data collected: vaccine given at birth (HBV only), Hep B immunoglobulin given if indicated (HBV only), vaccine course completed (HBV only) and serology at or after 12 months (HBV & HCV).

Results: Of 138 infants born to 100 HBV infected mothers, 67 had a full course of the vaccine and/or negative serological testing, 65 had only the first dose of the vaccine recorded in the notes, their full records are being traced from primary care providers. 4 did not receive the vaccine at birth, 1 infant died in the neonatal period and 1 child's notes were untraceable. For 14 infants Hep B immunoglobulin was indicated, 13 received it.

There were 13 HCV positive mothers, who gave birth to 17 children. Of these 8 had negative serology at 1 year; it is unknown if 7 were tested and for 2 records were untraceable.

Conclusions: The audit indicates that some at-risk infants were not adequately managed; one of these was later confirmed to have contracted chronic HBV. Stringent safeguards are indicated to prevent such errors occurring in future. Improved record sharing between primary and secondary care providers would help track infants once discharged, facilitating continuation of their care.

ESPID-0833

EARLY EFFECTS OF VACCINATION WITH THE 10-VALENT PNEUMOCOCCAL VACCINE ON ANTIBIOTIC RESISTANCE IN PNEUMOCOCCI IN ICELAND

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Penicillin non-susceptible pneumococci (PNSP) have been very prevalent in Iceland in recent years, especially in middle ear isolates. Vaccination with conjugated pneumococcal vaccines was first introduced into the childhood vaccination schedule in April 2011, using the 10-valent vaccine alone (Synflorix). The aim was to evaluate the effects on antibiotic resistance.

The catchment area of the reference laboratory defined the study population (about 85% of the Icelandic population; 27.500 children <7 years old in 2011). The study period was 01-Jan-2008 – 31-Dec-2013. All pneumococci isolated from blood, cerebrospinal/joint fluids, middle ear, conjunctiva, sinuses and lower respiratory tract from children <7 years old were included. Oxacillin resistant isolates were tested for penicillin MIC and regarded as PNSP if $\geq$0.1 mg/l.

The total number of isolates was 1185 of which 465 (39%) were PNSP. The number of PNSP (and proportion) was 80 (39%), 101 (44%), 93 (41%), 101 (50%), 48 (33%) and 42 (24%) for the years 2008-2013 respectively. Most were from the middle ear (n=989) of which 429 (43%) were PNSP, decreasing from 57% in 2008 to 28% in 2013. The most common serotype among the PNSP was 19F, which was almost always also resistant to tetracyclines and macrolides. Overall macrolide resistance was 40%, decreasing from 40-52% in 2008-2011 to 30% and 24% in 2012 and 2013 respectively.

The number of PNSP was reduced by about 50% and the proportion of PNSP from 39-50% to 24% in 2013. Further reductions are expected when a larger proportion of the children have been vaccinated.

ESPID-0834

THE BASELINE TITERS OF WIDAL AGGLUTINATION TEST FOR HEALTHY INDIVIDUALS IN TURKEY

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Background: The Widal tube agglutination test has been widely used in the serologic diagnosis of typhoid fever. A normal baseline titer among the healthy population have not been established in Turkey. This study was undertaken to determine the baseline titers of Widal agglutination test for healthy individuals in our country.

Methods: We measured average baseline antibody titers against "O" and "H" antigens of Salmonella enterica serotype Typhi, "H" antigens of serotypes Paratyphi A and Paratyphi B and "O" antigens of serotype Paratyphi B among apparently healthy children and adults from different regions of Turkey between 2006-2008.

Results: Among the 1639 blood samples collected from healthy volunteers (15 days to 87 years), 272 individuals (16.5%) had significant antibody titers (≥ 1:50) against one of the five antigens against S. enterica. Among 272 samples with an anti-H titer against serotype Typhi; 126, 63, 41, 20, 10, 5, 3 and 4 samples had titers of 1:50, 1:100, 1:200, 1:400, 1:800,1:1600, 1:3200 and 1:6400, respectively. Among 198 samples with an anti-O titer against serotype Typhi; 78, 36, 26, 17, 9, 13, 7 and 12 samples had titers of 1:50, 1:100, 1:200, 1:400, 1:800,1:1600, 1:3200 and 1:6400, respectively. For S. enterica serotypes Paratyphi A and B, anti-H titers of ≥ 1:50 were found only in 3.9% and 4.6%, and Paratyphi B anti-O titers were found in 6.7%, of all samples tested.

Conclusion: Baseline titer of antibodies is normally elevated in healthy individuals in endemic areas, the positivity rate of Widal agglutination test was found 16.5% in our study. Thus single test could not be use for the diagnosis of typhoid fever, it is more beneficial in patients who have clinical typhoid fever.

ESPID-0835

MANAGEMENT OF YOUNG FEBRILE INFANTS: VARIABILITY AMONG FRENCH EMERGENCY PEDIATRIC DEPARTMENTS AND COMPARISON WITH CURRENT GUIDELINES

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Aim: To describe emergency pediatric departments' management of young febrile infants and compare them with current guidelines.

Methods: Laboratory testing, imaging and treatment decisions were collected in a prospective cohort study of febrile infants aged 7 to 92 days examined in 15 French emergency pediatric departments. Frequencies of tests, antibiotics prescriptions and hospitalization were compared between participating centers. We performed univariate descriptive analyses and multivariate analysis. Variations from guidelines were categorized into several alternative scenarios. Strategies were compared with guidelines and analyzed across the 15 centers.

Results: Almost all of 2204 included infants had white blood cell counts and C-reactive protein measures. Blood and urine cultures, lumbar puncture, respiratory virus testing and chest radiography were performed in 62%, 68%, 64%, 33% and 67% of patients respectively. 42% of infants were treated by antibiotics and 74% were hospitalized. Rates of prescribed tests, antibiotics treatments and hospitalizations were all significantly different between centers even after controlling for age, clinical appearance and duration of fever. The rate of compliance rate to guidelines according the clinical scenarios was estimated at 80%. Variations from guidelines were significantly different between centers.**Conclusion:** Management of fever in infant younger than 3 months differed among pediatric emergency departments and also differed from guidelines. Further studies should evaluate current strategies.

ESPID-0836

INFANT BOTULISM: IDENTIFICATION OF A NOVEL SOURCE OF INFECTION WITH CLOSTRIDIUM BUTYRICUM TYPE E TOXIN

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Introduction

Two cases of infant botulism were notified to the Department of Public Health, Dublin, in 2011 and 2013. Clinical histories, treatment and laboratory results are described. Environmental sampling enabled the identification of a previously undescribed source, with implications for prevention and control.

The two infants had similar histories: weakened sucking and laboured breathing at about 10 days of age; severe motor weakness and hypotonia; sluggish, dilated pupils and diminished reflexes despite clinical improvement following intubation and ventilation. The Foodborne Reference Laboratory, Colindale, London, detected Type E neurotoxigenic clostridia from infant faecal samples. Both cases responded to equine antitoxin. Botulism Immune Globulin Intravenous (Human) (BIG-IV) from the Infant Botulism Treatment and Prevention Program, California, was administered to prevent relapse.

Environmental sampling included a wide range of items, including vitamin drops, infant formula etc. In Case A, *C. butyricum* (similar to that from faecal samples) was detected in water from the tank of pet terrapins and in terrapin food from an opened container. The family of Case B visited a house with ornamental fish and they also met visitors who kept a pet terrapin. The terrapin tank water tested positive for Type E toxin producing *C. butyricum*. That terrapin was not fed terrapin feed.

Public health information on reptiles, including terrapins, was updated. An alert was sent to EU National Contact Points, and terrapin suppliers, petshops and website owners were requested to disseminate information on this risk to owners of terrapins.

ESPID-0837

MOLECULAR INVESTIGATIONS FOLLOWING UPSURGE OF INVASIVE AND NON-INVASIVE GROUP A STREPTOCOCCAL (GAS) INFECTION IN ENGLAND

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Background:

An unusual increase in invasive GAS (iGAS) disease and scarlet fever (SF) occurred in England in 2008/09, with SF notifications the highest since 1995/96 particularly amongst children (<15y), promoting a widespread investigation. A significant increase in a specific type (*emm*/M3) was observed during this period. Using comparative genomics we examined the phylogenetic characteristics, diversity and 'evolutionary drift' of *emm*/M3 from invasive and superficial disease as a means to understand the drivers for the increase in incidence.

Methods:

A total of 296 GAS *emm*/M3 strains from 2001 to 2011 (including pre and post upsurge) were randomly selected from across all age groups and examined using whole genome sequencing (WGS).

Results:

WGS analysis differentiated *emm*/M3 strains into three sequence types (STs): ST15 (38%), ST315 (49%) or ST406 (13%). Examination of the accessory genome identified a novel phage-containing clade of ST15 strains (54/296 across all age groups and 23/54 from children <15y), the majority of which were from the upsurge period (47/54). This novel phage (speC phage) comprised 63 genes; two are the exotoxin gene *speC* and DNAase gene *spd1*.

Conclusions:

Using WGS we identified a novel phage-containing clade of GAS *emm*/M3 strains associated with the unusual upsurge in iGAS infections, particularly SF amongst children. We hypothesise that phage-encoded proteins contributed to this emergence either through increased biological activity or through reduced population immunity. Prompt genomic analysis of GAS isolates emerging in the UK population could translate into rapid identification and improve public health warning systems for newly emergent invasive strains.

ESPID-0838

EFFECTS OF 5 YEARS OF IMMUNIZATION WITH HIGHER VALENT PNEUMOCOCCAL CONJUGATE VACCINES IN GERMAN CHILDREN

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Background and aims: A general recommendation for vaccination with pneumococcal conjugate vaccine (PCV) was issued for German children ≤2 years in 2006. In 2009, two higher-valent PCVs (PCV10, PCV13) were licenced in Germany. Here, we present data on invasive pneumococcal disease (IPD) -cases sent in for serotyping in the eight years following the start of PCV-vaccination.

Methods: Pneumococcal isolates recovered from children with IPD were sent to the GNRCS. Serotyping was performed using the Neufeld-Quellung-reaction.

Results: From July 2012 to June 2013, an increase in IPD cases among children <2 years was observed for the first time since the introduction of childhood vaccination (98 vs. 75 cases in 2011-2012). This change in trend seems to persist in July-December 2013, and is caused by an increase in non-PCV13 serotypes.

Cases with PCV7 serotypes decreased by over 90%, while cases with non-PCV7 serotypes more than doubled. The six new serotypes increased after PCV7 introduction but decreased after higher-valent vaccine introduction. In 2012-2013 only 20 cases (PCV13nonPCV7) were reported, as compared to 59 in 2009-2010 (-66%). Reduction was observed for serotypes 1(67%), 3(50%), 7F(82%) and 19A(50%). Among the nonvaccine serotypes, 10A, 24F, 15B/C and 38 were most prominent.

Conclusions: Eight years after the general vaccination recommendation PCV7 serotypes have almost disappeared among children <2 years, while strong effects of higher-valent PCVs are observed. An increase in non-vaccine serotypes has become apparent in 2012-2013, however, a net reduction of cases was still observed.

ESPID-0839

MICROBIOLOGICAL ANALYSIS OF MIDDLE-EAR-FLUID (MEF) AND NASOPHARYNGEAL-CARRIAGE (NC) OF INFANTS WITH ACUTE OTITIS MEDIA (AOM) IN GERMANY, 5TH STUDY YEAR

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Background and aims: In Germany a general recommendation for pneumococcal conjugate vaccination was issued in 2006. Starting with PCV7, we saw the introduction of PCV10 and the replacement of PCV7 by PCV13 in 2009. We analyzed the pathogens recovered from children suffering from AOM with efflux as well as their nasopharyngeal carriage in the most recent study period from Oct.2012-Oct.2013.

Methods: MEF- and NC-swabs were taken from children with spontaneously draining AOM. Serotyping of *Streptococcus pneumoniae* isolates was performed using Neufeld-Quellung reaction.

Results: In the first three years of the study, 443, 310 and 210 patients could be included. Because of this declining number of reports, the recruiting-basis was increased from 50 to 75 centers in year4 of the study resulting in 439 patient-reports. In year5 the number of children with AOM with efflux declined to 354. Nasopharyngeal swabs were obtained from 350 (98.9%) of these patients.

118 MEF-samples showed relevant growth and the following pathogens were identified: *S.pneumoniae* (21/17.8%), *Streptococcus pyogenes* (64/54.2%), *Staphylococcus aureus* (24/20.3%), *Haemophilus influenzae* (15/12.7%) and *Moraxella catarrhalis* (1/0.8%). NC-rates were: *S.pneumoniae* 44.9%, *M.catarrhalis* 28.3%, *H.influenzae* 39.1%, *S.pyogenes* 20.9% and *S.aureus* 9.7%.

Most prevalent serotypes in MEF were 3 and 19A, in NC: 3, 10A and 11A. Coverage of PCV13 was 57.1% (MEF) and 24.2% (NPS).

Conclusions: The prevalence of *S.pneumoniae* in MEF in the 5th study year was as low as in the 4th year. Serotypes 3 and 19A remain the most prevalent among AOM. The increase of serotypes 10A and 11A needs further observation.

ESPID-0840

HUMAN PARECHOVIRUS (HPEV) INFECTIONS: CASE REPORT OF HPEV-ASSOCIATED ACUTE DISSEMINATED ENCEPHALOMYELITIS (ADEM) AND SYNDROMIC SURVEILLANCE IN 284 CHILDREN WITH CNS-INFECTIONS

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Background and Aims: Human Parechovirus (HPeV) infections may cause a variety of clinical symptoms in children, but syndromic surveillance data are currently lacking. This study aims to assess HPeV-associated disease burden in infants and children with CNS-infection.

Methods : The study was conducted in the context of a Quality Management Program at the Charité Department of Paediatrics. For detection of HPeV and molecular typing, stool samples were analysed at the National Reference Centre for Poliomyelitis and Enteroviruses at the Robert Koch Institute in Berlin, Germany.

Results: A 5 year-old Caucasian female presented with fatigue, acute hemiparesis/hyporeflexia and central facial paresis, recent febrile illness and HPeV-positive stool, but no recent immunisations. CSF-analysis revealed 7 leukocytes (98% lymphocytes), negative bacterial and viral cultures, and oligoclonal IgG-bands. Multiple demyelinising lesions consistent with ADEM were confirmed by MRI and brain biopsy. The patient received high-dose i.v. methylprednisolone followed by oral prednisolone for three months. The patient recovered clinically, but ADEM lesions persisted up to six months after disease onset.

Syndromic surveillance from 10/2010-12/2012 resulted in 284 paediatric cases of CNS-infection/inflammation. Of these, twelve cases (4.2%) showed RT-PCR-confirmed HPeV-infection with no alternative pathogen detected in routine care. HPeV-infection was significantly associated with age 1-4 years, seizures and rash (RR (95% CI) = 2.12(1.26-3.54), 2.16(1.39-3.34) and 4.25(2.21-8.16), P = 0.004, 0.001 and <0.0001, respectively).

Conclusions : In hospitalised children, HPeV-infection may be associated with significant CNS disease, including post-infectious ADEM. In children <4 years presenting with acute seizures and rash, HPeV should be included in the differential diagnosis.

ESPID-0841

EVIDENCE OF WANING BCG RESPONSES IN CHILDREN UNDER FIVE; TIME TO INTRODUCE A BOOSTER?

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Background/Aims: The high susceptibility of very young children to TB disease and in particular severe disseminated disease is well documented but poorly understood. Investigating the immune mechanisms that predispose the development of TB disease is essential to expand our understanding of immune protection from TB. We hypothesized that younger children would have a distinctly different immune response to mycobacteria than older children and that this would predispose them to disseminated TB.

Methods: We recruited 83 healthy TB uninfected HIV negative BCG vaccinated children in four age groups, 0-1yr, >1<2yr, >2yr<5yr and >5yrs. Following in vitro stimulation, we compared their mycobacterial antigen specific immune responses, focusing on CD4, gd and regulatory T cells and the cytokines IFNg, IL17 and IL22 using flow cytometry and multiplex cytokine detection techniques.

Results/Conclusions: Our data demonstrates that healthy children of all ages have robust and comparable antigen specific effector and central memory recall immune responses to BCG as measured by IFNg production by CD4+, gd and CD8+ T cells. However, our finding of distinct differences between children <1yr of age and older children in levels of secreted cytokines associated with innate immunity support further studies of age-related differences in this specific part of the immune response. Interestingly, we found a waning of proliferative T cell responses to BCG with increasing age which raises the question of benefit of re-vaccination with BCG in high endemic areas to protect children 2yrs and over from disseminated TB.

ESPID-0842

IMPACT OF HIGHER-VALENCY CONJUGATE VACCINES ON INVASIVE PNEUMOCOCCAL DISEASE: PRELIMINARY RESULTS OF A EUROPEAN MULTICENTRE PROJECT

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Introduction and aims: The ECDC-funded SpIDnet network started in 2012 to assess the impact of pneumococcal conjugate vaccines (PCV) on invasive pneumococcal disease (IPD) in children. PCV7 was introduced during 2001-2009 and PCV10/13 during 2010-2011 in 10 sites from eight countries. Five sites use PCV13 only and five sites both PCV10 and PCV13.

Methods: We compared IPD incidence in children <2 years old by serotype groups (all types, PCV13nonPCV7, PCV7, nonPCV13) between prePCV10/13 periods (prePCV7 and PCV7) and each year after PCV10/13 introduction. We used random effects meta-analysis to calculate overall incidence rate ratios (IRR), associated heterogeneity tests (I^2) and 95% confidence intervals (CI).

Results: The table presents the overall IRR by period and serotype groups.

Reference period	IPD serotype groups	IRR Year 1 postPCV10/13 (95%CI)	I^2	IRR Year 2 postPCV10/13 (95%CI)	I^2
prePCV7	All types	0.30 (0.15; 0.62)	87.1%	0.32 (0.17; 0.51)	84.6%
	PCV7	0.03 (0.01; 0.05)	0.0%	0.05 (0.03; 0.08)	0.0%
	PCV13nonPCV7	0.81 (0.46; 1.43)	37.1%	0.40 (0.28; 0.59)	0.0%
	nonPCV13	1.08 (0.21; 5.45)	92.5%	1.34 (0.33; 5.48)	91.6%
PCV7	All types	0.75 (0.65; 0.86)	3.4%	0.68 (0.60; 0.78)	0.0%
	PCV7	0.23 (0.06; 0.86)	82.0%	0.33 (0.12; 0.91)	76.2%
	PCV13nonPCV7	0.54 (0.37; 0.77)	53.9%	0.35 (0.20; 0.61)	75.1%
	nonPCV13	1.21 (0.70; 2.08)	71.5%	1.50 (0.95; 2.38)	63.5%

Conclusions: SpIDnet preliminary results indicate a decrease in IPD incidence after PCV10/13 introduction, with marked decline of PCV13nonPCV7 IPD in year 2. High heterogeneity (I^2>75%) might be related to different serotype distribution, vaccines or vaccination coverage and needs further investigation.

ESPID-0843

PERFORMANCES OF URINE DIPSTICK TESTS FOR THE DIAGNOSIS OF URINARY TRACT INFECTION IN INFANTS LESS THAN 3 MONTHS AGE

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Background: Urinary tract infection (UTI) is the most common bacterial infection in infants under 3 months age. However, at his age, the performances of the dipstick are controversial.

Aim: To determine the diagnostic accuracy of dipstick tests for detecting UTI in young febrile infants.

Methods: Data were collected in a multi-center prospective cohort study of febrile infants, aged 7 to 92 days examined in French emergency pediatric departments. We defined UTI by the growth of a single pathogen ≥ 50000 CFU/mL (catheterization) or ≥ 100000 CFU/mL (bag). Rapid tests were considered when detecting trace or greater result for leucocyte esterase (LE) or nitrite (NI) on dipistick. Diagnostic test characteristics were described and compared between sexes.

Results: A total of 722 urine samples had both dipstick and urine culture performed, of which 89% were obtained by bag. For LE and/or NI, sensibility and specificity were 84 and 89% respectively. No difference of sensibility between sexes was observed (78% in girls vs 86% in boys), but specificity was higher in boys (95% vs 81% in girls, p<0.001). A negative result for LE and/or NI (negative likelihood ratio (LR), CI 95%: 0.18, 0.12-0.27) decreased probability of overall UTI to 3%; similarly in girls (LR- : 0.26, 95% CI: 0.14-0.5) and boys (LR-: 0.15, CI 95 %: 0.09-0.25) with post-test probability of 3% in both sexes.

Conclusion: Urine dipstick test provided similar results for detecting UTI in infants less than 3 months age to those previously obtained in older infants.

ESPID-0844

SCREENING NEWBORNS FOR CONGENITAL CMV REFERRED IN THE NEONATAL HEARING SCREENING PROGRAM - THE LEIDEN CONCERT STUDY 2.0

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Introduction
Congenital Cytomegalovirus (cCMV) infection is the most frequent cause of non-hereditary congenital hearing loss. Hearing loss may be the earliest indication of a cCMV infection in otherwise healthy infants. The earlier infants with cCMV are diagnosed, the better their chances for appropriate medical treatment and audiological care. Infants referred in the neonatal hearing screening program (NHS) for audiological diagnostics have a higher possibility of having hearing loss. Therefore, it could be effective to investigate whether these referred infants have a cCMV infection before waiting for the final diagnosis of hearing loss.

Aims
Determine the prevalence of cCMV and describe the hearing loss in the group of referred newborns in the NHS program. Determine whether referred newborns should be screened for cCMV.

Methods
Parents of infants who failed the NHS in The Netherlands are invited to participate in the CONCERT study. Dried blood spots are tested for CMV. The outcome of audiological investigations are recorded.

Results
Parents of 394 infants who failed NHS agreed to CMV testing in dried blood spots. Of these, 19 (4,82%) were positive for CMV (0,54% birth prevalence). All infants with cCMV had confirmed hearing loss: 9 with bilateral and 8 with unilateral hearing loss.

Conclusions
Newborns referred for possible hearing loss by the NHS should be tested for CMV. Medical and audiological care and follow-up can then be expedited for the individual infant. Future studies may decide if testing all infants with suspected hearing impairment for congenital CMV is necessary.

ESPID-0845

WHAT IS A POTENTIALLY DETRIMENTAL VACCINATION DELAY FOR CHILDREN LESS THAN 2 YEARS OF AGE?

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Background: delays between the recommended age for immunization and the age at realization of a vaccine may expose to the infection referred.

Objective: to define the period of vaccination delay potentially detrimental at an individual level for each vaccine dose in the French immunization schedule in healthy children <2 years of age.

Methods: a Delphi study was performed in 2013 among French experts in paediatric vaccinology (Infovac, France) and infectious diseases (scientific committees of the PID Group). A pre-round phase of pertinent vaccine delays identification was first performed by the investigators of the study. Then these delays were submitted by email to each expert for a first selection, choices reduction and final selection in three successive rounds. The selection threshold was set at 70% of the plebiscite.

Results: 37 experts were contacted. The participation rate was >75% in each round. A consensus was reached for six of the 10 vaccine doses recommended for children <2 y.o. (table). For the other four vaccine doses, an upper limit could be proposed.

Conclusion: the vaccine delay is complementary to the notion of vaccine coverage. It would be a more discriminating assessment criterion of the immunization status. Dissemination of this concept and these definitions among vaccinators could improve the implementation of vaccine recommendation.

Vaccines	**Delays proposed**					**Consensus**	
1st DTPa-IPV-Hib (2m)	≥1d	≥7d	**≥15d**	≥28d	Other	Y (71%)	**15d**
2nd DTPa-IPV-Hib (4m)	≥1d	≥7d	**≥15d**	≥28d	Other	Y (79%)	**15d**
Booster DTPa-IPV-Hib (11m)	**≥2m**(43%)	≥6m	≥1y	≥2y	**Other : 1m**(46%)	N	2m
1st PCV13 (2m)	≥1d	**≥15d**(61%)	≥1m	≥2m	**Other : 7d**(32%)	N	15d
2nd PCV13 (4m)	≥1d	**≥15d**	≥1m	≥2m	Other	Y (86%)	**15d**
Booster PCV13 (11m)	≥1d	≥15d	**≥1m**(68%)	**≥2m**(29%)	Other	N	2m
Hepatitis B (completed)	≥16m	≥6y	**≥11y**	≥16y	Other	Y (79%)	**11y**
Meningococcus C (12m)	**≥1m**	≥2m	≥6m	≥1y	Other	Y (83%)	**1m**
1st MMR (12m)	**≥1m**	≥3m	≥6m	≥1y	Other	Y (89%)	**1m**
2nd MMR (15-18m)	**≥1m**(25%)	≥3m	**≥6m**(64%)	≥1y	Other	N	6m

ESPID-0846

ANTIBIOTIC PRESCRIBING FOR PEDIATRIC INFECTIONS IN THE PEDIATRIC EMERGENCY DEPARTMENT.

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Background and aims: Data about antibiotic prescribing in the Pediatric Emergency Departments (PED) are very limited. The aim of this study was to assess trends in antibiotic prescribing for pediatric infections in the PED of a Tertiary Hospital.
Methods: We retrospectively recorded epidemiological characteristics, diagnosis and treatment of all children that attended our PED on the four first days of each month during a 12-month period.
Results: A total of 2.416 children attended the PED and infection was diagnosed in 944 with a median age of 4 years (IQR: 2-7). In 429 (16,9% of all seen and 43,3% of those diagnosed with infection) antibiotics were prescribed. The commonest infections were: upper respiratory tract (URTI) (37,7%), tonsillitis (16,4%), gastroenteritis (12,8%) and otitis media (12,6%). The diagnoses most frequently resulted in antibiotic prescribing were: otitis media, skin infection, tonsillitis and LRTI in 94%, 83%, 68% and 48% of cases respectively. One in 5 children with the diagnosis of URTI received antibiotics. Antibiotics were prescribed in 40% of afebrile children (commonly due to otitis media and skin infection). Amoxicillin in infants and amoxicillin/clavulanic and clarithromycin in older children were the most frequently prescribed antibiotics.
Conclusions: Our study demonstrates high rates of antibiotic prescriptions for pediatric infections the majority of which are viral in origin. More judicious use of antibiotics is needed in the PED setting. Larger studies are also required in the field with the view of reducing unnecessary prescribing and the development of resistant pathogens.

ESPID-0847

DIAGNOSTIC VALUE OF PROCALCITONIN FOR DETECTION OF SERIOUS BACTERIAL INFECTIONS IN FEBRILE INFANTS LESS THAN 3 MONTHS OF AGE

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Aim: To assess performance of procalcitonin (PCT) for identifying serious bacterial infection (SBI) and invasive bacterial infection (IBI) in febrile infants younger than 3 months without an identifiable bacterial source.

Method: a prospective multi-centric observational study included children aged, 7 to 92 days with fever of unknown origin admitted to 15 French pediatric emergency departments. A final diagnosis (SBI, IBI or not bacterial infection) was established. Serum samples were collected on admission for quantitative PCT determination.

Results: PCT and C-reactive protein (CRP) values were known in 2047 infants. Twenty-one children (1%) had IBI (bacteremia, n=13; meningitis, n=8) and 124 (6%) had SBI (urinary tract infection, n=115; others, n=9). The areas under receiver operating characteristic curve (AUC) for PCT and CRP were 0.76 (95% CI 0.71-0.80) and 0.78 (95% CI 0.74-0.82) among patients with SBI, respectively. In the 21 children with IBI, the AUC for PCT (0.92, 95% CI 0.85-0.99) was higher than that for CRP (0.80, 95% CI 0.69-0.91). The optimal cut-off points for PCT and CRP in detecting overall bacterial infection were determinated at 0.3 ng/ml and 20 mg/L, respectively. Negative likelihood ratios for PCT < 0.3 ng/mL and CRP < 20 mg/L were 0.11 (95% CI 0.03–0.44) and 0.30 (95% CI 0.14–0.65) in patients with IBI, respectively. PCT <0.3 ng/mL almost ruled out IBI (post-test probability of disease 0.1%).

Conclusion: PCT diagnostic properties were similar than those of CRP for identifying SBI in febrile infants ≤ 3 months. PCT performs better than CRP in detecting IBI.

ESPID-0848

IMPLEMENTING A CHAGAS DISEASE PAEDIATRIC CLINICAL RESEARCH NETWORK (PEDCHAGAS) IN ARGENTINA

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Introduction
Clinical pharmacology of drugs used for treatment of Chagas disease (CD) has been poorly studied in adults, and no information is available for children.
Methods and Results
The pressing need for paediatric pharmacology data on these drugs led us to perform the first paediatric pharmacokinetics study of benznidazole (BNZ), at the Children's Hospital 'R Gutierrez' (Buenos Aires). This study enrolled 40 children, aged 2-12 years, and demonstrated excellent response rates, despite lower plasma BNZ levels in children compared to those previously observed in adults.
For expansion of the population studied to children under 2 years-old, with the support of DNDi, a paediatric clinical research network (PEDCHAGAS) was formed by the association of Argentinean paediatric research centres, the Children's Hospital 'R Gutierrez' (coordinating center), Jujuy Children's Hospital, Salta´s Mother-Child Hospital, Santiago del Estero´s Chagas Center and the Institute 'Fatala Chaben' (Buenos Aires).
PEDCHAGAS trial was the first multicenter clinical pharmacology study on paediatric CD, using a novel paediatric BNZ formulation with 80 children enrolled (neonates-12 years), and confirmed the high response to BNZ. BNZ blood concentrations were similar to those observed in the previous study.
Presently, a new study is underway aiming at identifying and validating T. cruzi molecules for improvement of CD diagnosis and follow-up. Other therapeutic studies in paediatric CD are planned for initiation.
Conclusions
Implementation of an interdisciplinary paediatric CD clinical research network under standardized guidelines and protocols resulted in a highly skilled working group of researchers and clinicians to develop clinical studies in the paediatric population.

ESPID-0849

PCR AS A MARKER OF CURE IN PAEDIATRIC CHAGAS DISEASE

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Introduction: The main limitation in evaluating treatment response in Chagas disease using conventional serology stems from the need for long-term follow-up (years to decades) to observe negativization of *Trypanosoma cruzi*-specific antibodies. PCR to detect *T. cruzi* DNA in blood samples has been proposed as a new tool for the early evaluation of treatment response. Furthermore, standardized real time PCR protocols for detection of *T. cruzi*'s DNA were developed.

Methods: We evaluated serological response by conventional serology and F2/3 lytic antibodies by ELISA, and parasitological response by PCR in 3 cohorts of Chagas disease children (207 in total) treated for 60 days with benznidazole or nifurtimox. Samples were taken before and during treatment (days 7, 30 and 60) and during follow up at 3, 6, 12, 24, and 36 months.

Results: Before treatment, 92% of patients had positive PCR. During follow-up, PCR became negative in 98% of those initially positive, with clearance of parasitemia early during treatment course for the large majority of patients. In children under 2 years, a strong correlation was observed between negative PCR results and negativization by conventional serology, and F2/3 lytic antibodies, when available. In older children, conventional serology titers more gradually declined over time, but PCR became negative before the end of treatment and remained negative during follow-up.

Conclusions: An excellent therapeutic response was observed in children with Chagas disease, as measured by both serological methods and PCR. PCR negativization should be considered as an early marker of cure in treated Chagas disease children.

ESPID-0850

BACTERIAL MENINGITIS IN SLOVAKIA DURING YEARS 1997 - 2013, A RETROSPECTIVE STUDY

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Introduction and aim: Bacterial meningitis is an important cause of childhood morbidity and mortality. The aim of this work is to analyse the bacterial meningitis in association with vaccination against in Slovakia.

Methods: Retrospective review of bacterial meningitis cases reported from January 1997 to December 2013. The bacterial diseases (caused by Neisseria meningitidis, Haemophilus influenza type b (Hib) and Streptococcus pneumonia, other specific and non-specific causes) are obligatory reported communicable diseases based on the standard criteria of ECDC in Slovakia. The data on morbidity are from the Epidemiological Information System (http://www.epis.sk/).

Results: During 1997-2013 were reported 2,774 cases of bacterial meningitis: 1,171cases (42.2%) in 1997-2001; 748 cases (27.0%) in 2002-2006; 658 cases (23.7%) in 2007-2011; 197 cases (7.1%) in 2012-2013. Reported morbidity of meningitis in the period 1997-2013 was from 2.62 in 2004 to 4.86/100 000 population in 1997, reported mortality – from 0.10 (2004) to 0.61/100 000 (1997). The highest age specific morbidity and mortality was in the group of 0-years-old children.

Conclusions: This study covers pre-meningitis vaccination era and vaccinal eras. The first vaccination began on 2000 with Hib vaccine, the second began on 2009 with pneumococcal conjugate vaccine (PCV7, than PCV 13). We emphasize a radical reduction of Hib meningitis. The impact of pneumococcal vaccination is not yet obvious. Neisseria meningitidis is currently the frequent germ of bacterial meningitis.

ESPID-0851

A POINT PREVALENCE SURVEY (PPS) OF NEONATAL ANTIBIOTIC USE IN THE UK

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Introduction: Neonatal units are areas of high antibiotic consumption and high risk areas for development of antibiotic-resistant bacteria.

Aims/Objectives: To describe antibiotic use in UK neonatal units participating in the PPS of the Antimicrobial Resistance and Prescribing in European Children (ARPEC) project (http://www.arpecproject.eu/).

Methods: Two one-day ARPEC-PPS were completed in September 2011 and November 2012 in 50 and 174 hospitals across 14 and 24 European countries respectively. Data were collected using standardized forms using the ARPEC-WEBPPS program. Use and dosing of antibiotic prescriptions were analysed from 61 UK neonatal units. Under-dosing was defined as >10% below the lower dose recommended in the British National Formulary for Children.

Results: Data were recorded on 777 recorded prescriptions in 394 neonates; median age 5 days (IQR:2,19), 67% male, 22% <1kg birthweight. 21 different antibiotics were used: dual therapy was identified in 70% of neonates. Benzylpenicillin and Gentamicin was the most common combination prescribed in all unit levels (57% of prescriptions). Vancomycin was 3rd most frequently prescribed in level 3 units versus Cefotaxime in level 2-3 units. Meropenem was almost exclusively prescribed in level 3 units. Median dose of gentamicin was 3mg/kg (IQR:2.6-3.8) in <32 weeks gestation and 4mg/kg (IQR:3.9-4.9) in >32 weeks gestation. Under-dosing occurred in >20% of prescriptions of Gentamicin and Vancomycin .

Conclusions: A wide range of antibiotics are used across neonatal units within the UK. Establishing antimicrobial stewardship programs should focus on consistent type and dosing of antibiotics as important factors of optimising antimicrobial treatment.

ESPID-0852

INVASIVE GROUP A STREPTOCOCCUS INFECTION IN CHILDREN. A RARE BUT LIFE-THREATENING DISEASE

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BACKGROUND : Invasive Group A Streptococcus infection (iGAS) is defined as the isolation of GAS from normally sterile site. Varicela, inmunosuppresion, age under 5 years, are risk factors.

METHODS: A 10-years (2003-2013) retrospective study was performed in children with iGAS admitted at the Pediatric Department, Hospital Clinico of Valencia, a tertiary and universitary hospital.

We collected: age, risk factors, clinical, microbial and laboratory findings, treatment and outcome.

RESULTS: 7 cases were found: 2 sepsis, 2 pneumoniae with pleural effusion, 1 streptococcical toxic shock syndrome, 1 meningitis and 1 bacteremia. In the last ten years, 2290 cultures were positive for GAS, in children of our area.

Main age was 4.1±2.7 years. Only 2 had a risk factor for iGAS: varicela and corticosteroid treatment. The most common sign was high fever. Leukocytosis (26.477±13.959/mmc), increase of PCR (249.2±137.2 mg/L) and procalcitonin (133.4±244.8 ng/mL) were observed in the first 24 hours.

4 children needed ICU admission and the mortality risk (PIM2-score) was 13.2±23.9%.

2 patients required volemia expansion and 1 needed high doses of catecholamines.

6 patients received empirical treatment with 2nd or 3rd generation cephalosporin, and 1 with penicilin, during 13.4±4.3 days. The length of hospital stay was 14.3±6.8 days.

All GAS were sensible to penicilin and cephalosporin and 25,8% resistent to eritromicin.

All cases had a favorable evolution.

CONCLUSION : iGAS is a rare but potentially life-threating disease. The clinical presentation and laboratory findings are often non-specific. Fortunately, GAS is sensible to the empirical antibiotic treatment used.

ESPID-0853

HOSPITAL ADMISSIONS DUE TO VARICELLA IN CHILDREN OVER A TEN-YEAR PERIOD

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Background and aims

Varicella is a highly contagious disease, common in childhood. Although it usually has a benign course, complications occasionally arise. Immunosuppression poses a risk for such outcome. In Portugal vaccine is prescribed on an individual basis. This study aims to characterize admissions due to varicella and its acute complications over a 10-year period.

Methods

Review and descriptive analysis of the clinical files of children admitted with varicella from January/2003-December/2012 in the pediatrics department of a secondary care hospital.

Results

36 admissions recorded (0.6% of all varicella cases attended in the emergency department). Median age was 3 years (6days-14years). 19 male. 3 had immunossuppressing conditions. 30 children were admitted due to varicella complications, 4 for monitoring due to high-risk of severe varicella, 2 due to adverse drug reactions. The most frequent complications were neurologic (18), followed by skin/soft tissue (11) and respiratory infections (2), including 1 empyema. 1 case of pancreatitis and 1 case of sepsis with ischemic stroke were recorded. The latter was the only one to sustain sequelae. None of the immunosuppressed developed complications. *S.aureus* was identified in 2 cases. Antibiotics were given in 13 cases, acyclovir in 15 (3 immunosuppressed). Average length of hospitalization was 3 days. 1 child needed intensive care.

Conclusions

Despite being considered a mild disease, varicella can cause serious complications in immunocompetent children. In our study varicella-related admissions were infrequent and mostly due to neurologic complications with benign outcomes. A nation-wide survey could be important to acquire broader comprehension on this matter.

ESPID-0854

ERYTHEMA MULTIFORME WITH EXCLUSIVE ORAL MANIFESTATIONS IN A TWELVE-YEAR-OLD BOY

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Background: Erythema multiforme (EM) is an uncommon, immune-mediated disorder that presents with cutaneous and/or mucosal lesions. HSV infection is the most common triggering factor. Children with oral EM present with oral and lip ulcerations typical of EM but without any skin target lesions.
Case report: Twelve-year-old boy admitted with oral pain and feeding difficulties due to blistering and ulceration of the mouth/lips for the past 2 weeks. He mentioned two similar episodes of blistering of the oral cavity in the past 3 years, less severe, that persisted for 3 days and were treated with acyclovir for presumptive diagnosis of herpetic gingivostomatitis. He denied ingestion of food with additives or chemicals; medication besides acyclovir, that was used for the first 4 days of oral manifestations. Oral examination revealed multiple coalescing bullae with cracking and encrustations on upper and lower lip, labial and buccal mucosa. The patient had no skin target lesions. Positive anti-HSV1 IgG antibodies were found. Incision biopsy confirmed EM. The patient was treated with systemic corticosteroids for 4 days with complete resolution of symptoms within 2 weeks. Clinical findings, previous HSV infection, no drug history and clinical resolution led to the diagnosis of oral EM, probably due to HSV infection.
Conclusions: The oral EM variant is a rare and underrecognized form of EM, and it is considered as a third category of EM other than EM minor and major. Early diagnosis and management of this disease in pediatric patients is important.

ESPID-0855

INTESTINAL PARASITIC INFECTIONS IN REFUGEE CHILDREN IN GENEVA: WHY SCREEN?

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Background:

Intestinal parasitic infections are endemic in developing countries, and can cause significant morbidities including iron deficiency anemia, malabsorption syndrome, or mental and growth retardation. In Switzerland, screening strategies for the refugee population coming from endemic areas differ and would benefit from epidemiological data. The objective of the study was to evaluate the prevalence of intestinal parasites in this population according to demographic characteristics and origin.

Materials and methods:

We retrospectively analyzed stool cultures' results of recently immigrated children screened in our hospital after their arrival.

Results:

618 paediatric patients aged 6 months to 16 years-old were evaluated between January 2002 and December 2011. Most had a single stool analysis (84.1 %), some had 2 exams (13.5%), or more (2.4%). Most children were from Eastern Europe (32.2 %), Africa (31.5%), Asia (20.2%), and Middle East (11.2%).

Pathogenic intestinal parasites, including *Blastocystis hominis*, were found in 161 children (26.2%). The prevalence was highest in children between 3 and 5 years of age. The most common parasites were *Blastocystis hominis* (47.2%), and *Giardia lamblia* (37.9%). Among helminths, *Trichuris trichiura* (14.9%), *Hymenolepis nana* (13.0%) and *Ascaris lumbricoides* (6.2%) were the predominant parasites. The prevalence of multiple pathogens was 20.5%.

Conclusion:

Even with a single stool exam, we found of a high prevalence of intestinal parasites in our immigrant population. Considering the lack of sensitivity of this exam, we probably underestimate this condition. A screening strategy based on demographic characteristics and origin should be developed to protect this vulnerable population.

ESPID-0856

PERSISTENT HIGH HERPESVIRUS-6 VIRAL LOAD: WHAT'S THE CLINICAL MEANING?

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Background and aims We report a three-years-old child with Down syndrome presenting with Streptococcus Pyogenes sepsis, severe acute respiratory failure and prolonged high Human Herpesvirus 6 (HHV6) viral load. He was treated with combined antibiotic therapy, antiviral therapy and immunoglobulins. Symptoms and positive blood culture resolved; viral load never decreased. Further diagnostic tests were performed to clarify the clinical case.

Methods HHV-6 replication was detected by quantitative real-time polymerase chain reaction (PCR) in plasma, whole blood and by qualitative real-time PCR in bronchoalveolar lavage (BAL). Therefore, supposing a chromosomal integration of the HHV6, we tested for HHV6 DNA in the hair follicles.

Results We detected a HHV6 DNA load between 30.000 and 42.000 copies per mL on plasma and between 23.000.000 and 49.000.000 copies per mL on whole blood. We also detected viral copies of HHV6 in BAL.
The test for HHV6 DNA in the hair follicles detected a high level of copies comparable with the ones in the patient's blood, thus confirming the hereditary transmission.

Conclusions The increase in viral load due to the genetic transmission of integrated HHV-6 could have been misinterpreted as substantial active infection. In patients with persistent high HHV6 DNA load, a test for HHV6 DNA in other somatic tissues, as hair follicles, is an easy method to discriminate between active infection and integration of HHV6 DNA into human genome. It will be important to prevent the latter from receiving unnecessary exposure to potentially toxic antiviral drugs and to earlier achieve the right diagnosis.

ESPID-0857

HIV/HCV CO-INFECTION IN CHILDREN AND YOUNG PEOPLE IN EUROPE: RESULTS FROM A COHORT COLLABORATION

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Introduction and aims: Our aim was to address the lack of data on the epidemiology and clinical course of HIV/HCV co-infection in childhood in Europe, particularly in the light of recent HCV treatment advances.

Methods: We performed a retrospective, cross-sectional study, within 11 European paediatric HIV cohorts. Patients aged >18 months and <25 years, with HIV/HCV acquired vertically or in childhood, were included.

Results: Of 225 subjects, 138 (61%) had vertically-acquired infection. HIV characteristics are presented in Table 1. HCV genotypes (GT) were as follows: 100 (56%) GT1, 5 (3%) GT2, 55 (30%) GT3, 20 (11%) GT4; 45=unknown. Overall 42% (85/200) of subjects had hepatomegaly in the previous 12 months and 60% had elevated ALT (above ULN). Of 96 patients with transient elastography, 55 (57%) had stiffness >5.9 kPa (8 with 9.6-12.5 and 4 with >12.5 kPa). Of 17 subjects with liver biopsies, 6 had bridging fibrosis and 1 cirrhosis. Fifty-five (24%) patients received HCV treatment (peg-interferon+ribavirin). Nineteen were continuing treatment; of the remainder, median treatment duration was 47 weeks (8, 82 weeks) (outcomes:Table 2).

Conclusion: The high proportion of patients with progressive liver disease underscores the need both for close monitoring and earlier treatment.

Table 1: Socio-demographic and HIV-related characteristics

Characteristic		N (%) or median (IQR)
Age at most recent visit		16.2 years (10.0-20.3)
White ethnicity		204 (91)
Area of residence:	Northern Europe	10 (4)
	Southern Europe	62 (28)
	Central /Eastern Europe	153 (68)
Has history of AIDS (n=198)		45 (23)
CD4 count at last visit (n=202) (cells/mm^3)		655 (417-905)
On antiretroviral treatment at last visit (n=198)		159 (80)
Undetectable HIV RNA at last visit (n=188)		114 (61)

Table 2: HCV treatment: preliminary outcomes

	GT 1	GT 2	GT 3	GT 4
Number treated	28	1	21	3
Number with SVR24 data	19	1	11	3
SVR24 rate	42%	100%	73%	0%

ESPID-0858

INFECTIONS IN CHILDREN WITH CANCER ACCORDING TO THE PRESENCE OR ABSENCE OF NEUTROPENIA

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Aim: To study the etiology, clinical course and outcome of infections in children with cancer according to the presence or absence of neutropenia.

Material and method: Fifty pediatric cancer patients who presented with 70 fever episodes were prospectively studied over a 12-month period. Inflammatory markers (WBC, ANC, C-reactive protein) were determined during each episode (i.e.at fever's onset and after 48h). Bacterial cultures, polymerase chain reaction (PCR) tests and serological testing were also obtained. Infections were classified as bacterial, viral or fever of unknown origin (FUOs).

Results: Among the 70 episodes of febrile illness, 54.3% were classified as bacterial, 18.6% viral, 4.3% fungal and 22.8% as FUOs, while 11/70 (20.3%) were characterised as mixed infections with more than one pathogens. Neutropenia was detected in 60% of the febrile episodes and was predominantly found among patients with haematologic malignancies than solid tumors [OR= 2.81(0.96-8.22), p=0.059]. Neutropenic patients in comparison with non-neutropenic ones had a significantly higher rate of mucosal and skin infections i.e.20/42 (47.6%) vs 1/25 (4%), p=0.004. They also had a higher rate of mixed infections, although the difference was not significant (38.9% vs 28.6%, P=0.41). However, the prevalence of opportunistic infections was not significantly different between the two groups (66.6% vs 64.28%, p=0.59). Mortality due to infection was observed in 2.85% of our pediatric cancer patients.

Conclusions: Febrile neutropenic patients had a higher frequency of bacterial infections as well as mucosal and skin infections compared to non-neutropenic ones, while the prevalence of opportunistic infections was comparable in the two groups.

ESPID-0859

INVASIVE CANDIDIASIS IN CHILDREN WITH ACUTE LYMPHOBLASTIC LEUKEMIA: A CASE SERIES ANALYSIS FROM A SINGLE INSTITUTION

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Background: Invasive candidiasis (IC) remains a major cause of morbidity and mortality in children with malignancies.

Objectives: To report our experience regarding IC in children with acute lymphoblastic leukemia (ALL) for the period 2008-2013.

Methods: We reviewed the medical records of patients who met the microbiological and clinical criteria for the diagnosis of IC.

Results: Five children (2 female) with ALL treated with the protocol BFM-95 or BFM-ALLIC 2009 met the criteria for IC. The median age was 4.5 (1.0-13) years old. Among them, two were stratified to high-risk, two to median and one to standard-risk ALL-group. In 4 cases, IC occurred immediately after chemotherapy induction phase (IP), while in one case IC presented during IP. Mannan antigen was positive in 4 patients. The location were subcutaneous nodules and splenic lesions in one case, multiple splenic lesions in one case, hepatopslenic lesions in two cases and liver with lung lesions in one case. No children died. One case was treated with monotherapy (liposomal AMB), while the other 4 with combination treatment (one with caspofungin and voriconazole, two with voriconazole or micafungin and liposomal AMB, and one with amphotericin B, caspofungin, voriconazole, fluconazole, micafungin and prednisolone). Splenectomy was conducted in one child. Microbiological data revealed *C. tropicalis* in one case and *C. albicans* in three cases.

Conclusions: The risk of developing IC is higher at the end of induction therapy, due to persistent neutropenia. High suspicion should be followed by prompt treatment that includes in most cases long period antifungal treatment.

ESPID-0860

VIRAL CO-INFECTION OF THE RESPIRATORY TRACT – INTERFERENCE BETWEEN RESPIRATORY SYNCYTIAL VIRUS AND HUMAN RHINOVIRUS

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Background and aims: Ongoing viral respiratory infection might prevent new infections by other viruses because of production of antiviral interferons, but simultaneous detection of 2 or more viruses has been reported frequently. The aim of our study was to analyze whether children with respiratory syncytial virus (RSV) infection have less commonly human rhinovirus (HRV) in their nose than matched control children.

Methods: In a prospective cohort study, nasal swabs were collected from children at the age of 0 to 24 months and analyzed for RSV, HRV and enteroviruses by PCR. A total of 4810 samples were obtained during symptomatic respiratory infections and 2275 samples during pre-scheduled visits at the age of 2, 13 and 24 months, regardless of the presence of symptoms. We compared the rate of HRV findings between children with symptomatic RSV infection and control children attending pre-scheduled visits, matching for age and date of sample collection.

Results: 226 children with symptomatic RSV infection and 226 matched control children were included. In children with symptomatic RSV infection, co-infection with HRV was detected in 18 cases (8 %), and in the control group HRV was detected in 31 (14%) children (p=0.049). 24% of children in the control group had mild symptoms of respiratory infection, and 4 were positive for RSV.

Conclusions: The rate of HRV infection was lower in children with RSV infection compared with children of same age in their usual state of health. This suggests that RSV infection partially prevents simultaneous HRV infections.

ESPID-0861

CHRYSEOBACTERIUM GLEUM POSITIVITY IN THREE CONSECUTIVE CASES WITH RESPIRATORY TRACT INVOLVEMENT – A POSSIBLE NEW NEONATAL PATHOGEN?

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Introduction: *Chryseobacteria* are yellow-pigmented, nonmotile, Gram negative bacilli that are rare pathogens and may cause infections especially in immunocompromised patients and neonates. The clinical importance of *Chryseobacterium gleum* has not been established yet.

Objectives: We report three patients with the clinical signs of early neonatal infection and *Chryseobacterium gleum* positive cultures.

Aims: We tried to find the connection between positive bacterial cultures and the signs of clinical infection.

Methods: On admission, stomach content, acoustic duct swab and hemoculture were taken from all neonates at the Neonatal intensive Care Unit. Microflex™ MALDI-TOF spectra were analyzed by a MALDI Biotyper RTC 3.1 software (Bruker Daltonik). Identification scores of ≥2.000 indicated identification at the species level, scores of 1.700 – 1.999 indicated identification at the genus level while scores of <1.700 were not regarded as identification.

Results: All patients had respiratory tract involvement with increased inflammation markers. *Chryseobacterium gleum* was cultured from the stomach and MALDI-TOF analysis identified all isolates as *Chryseobacterium gleum* with the scores of 1.749, 2.389 and 2.415 for the cases 1, 2 and 3, respectively. In two of the three cases *Chryseobacterium gleum* was the only bacterium detected. All the three isolates were sensitive to ciprofloxacin and recovery could be achieved with ciprofloxacin treatment.

Conclusion: Although hemocultures were not positive, patients had positive nasogastric aspirates and, while the empiric treatment with tobramycin and ampicillin was ineffective, ciprofloxacin treatment greatly improved the clinical picture. We consider our cases as a possible new clinical presentation of a rare human pathogen.

ESPID-0862

THIRTEEN YEARS EXPERIENCE OF MEROPENEM ADMINISTERED BY AMBULATORY INFUSION PUMPS IN A PEDIATRIC OUTPATIENT ANTIMICROBIAL THERAPY (OPAT) PROGRAM

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Introduction: Because of incertitude on the stability of meropenem, scanty data are available about the efficacy and tolerability of this antibiotic when used in OPAT. Objectives and aims: This study describes our clinical experience with meropenem administered to children at home with an ambulatory infusion pump.

Methods: Charts from patients treated with meropenem between 2000 and 2013 on OPAT were reviewed. Demographic, clinical and biological data as well as patients' outcome were collected.

Results: Among the 2334 cases of OPAT administered over the thirteen year period, 167 treatments with meropenem were recorded in 102 patients (50 girls) with median age of 11.6 years (7 weeks to 19 years). Median treatment duration was 15 days (4-252). The most common diagnosis were cystic fibrosis (53,2%), mastoiditis (9,6%), cholangitis (7,8%), appendicitis (7%), urinary tract infections (6,5%), osteomyelitis (3,6%) and CNS abscesses (2,4%). Meropenem was used in combination with other antibiotics in 107 episodes, most commonly with ceftazidime (28), tobramycin (26), vancomycin (20) and trimethoprim-sulfamethoxazole (16).

The most frequently reported side effects were rashes (9.9 %), nausea (8,8%), diarrhea (2.9%) and vomiting (2.9%). Eosinophilia and ALT/AST elevations were recorded in 16,4% and 16,4% respectively. Success rate was 94% although 12 unplanned rehospitalisations occurred: 9 for clinical deterioration or absence of improvement, 2 for side effects and 1 for a reason unrelated to treatment.

Conclusions: Administration of meropenem is a possible alternative for OPAT in children with a high success rate. Side effects need to be monitored by thoughtful clinical and biological monitoring.

ESPID-0863

ANALYSIS OF 2,748 CONFIRMED INFLUENZA CASES IN SERIOUS ACUTE RESPIRATORY SYNDROME (SARS) HOSPITALIZATIONS IN SÃO PAULO STATE (SP), BRAZIL - 2013.

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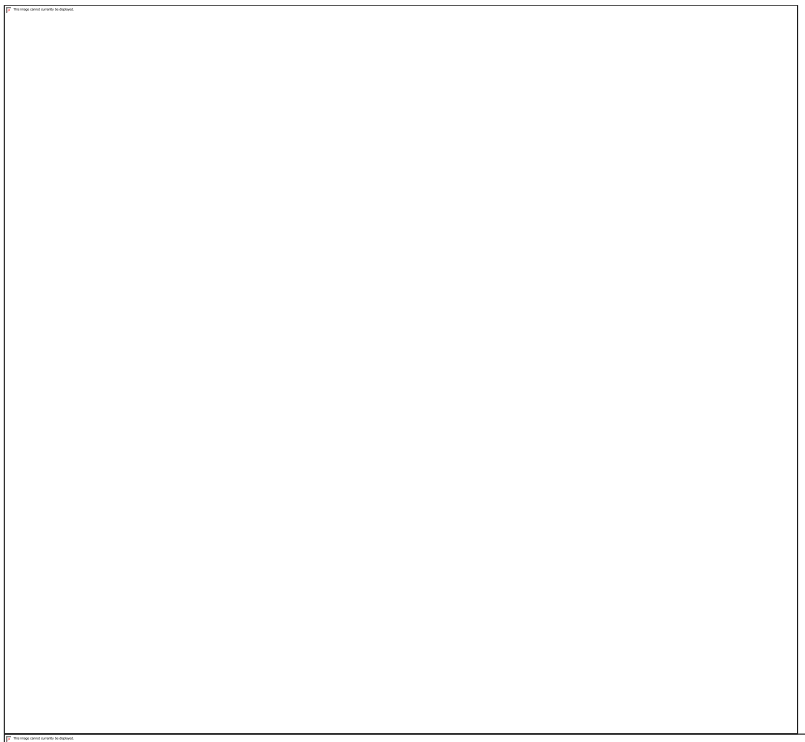
Background and objectives: Influenza is a preventable disease that causes great impact in all age groups. The aim of this study is to review laboratory data in confirmed influenza SARS hospitalization cases recorded in São Paulo (SP).

Methods: This is a descriptive study of SARS inpatients recorded in SP, from 01/01 to 12/15/2013. Data were obtained from the SINAN database and Institute Adolfo Lutz, and reviewed for age group, influenza types/subtypes and presence of comorbidities.

Results: In 2013, 14,234 individuals were hospitalized with SARS in SP. Influenza was identified in 2,758 (19.4%) SARS inpatients and 477 (26.9%) deaths were recorded. Influenza A(H1N1)pdm09 was identified in 71.6% of SARS inpatient cases and 85.3% of deaths cases (Fig.1). The majority of cases and deaths were confirmed in young adults (45-59 y). Influenza viruses' subtypes ratio identified in confirmed SARS inpatients and deaths cases by age groups is reported in Fig 2. Influenza A(H1N1)pdm09 was more frequently identified in SARS inpatients aged 40-60 y and B in 2-20 y. Information about previous vaccination and comorbidities was not available for all individuals, but the majority of SARS inpatients and deaths were confirmed in non-immunized ones. The prevalence of comorbidities in death cases was lower in children and adolescents.

Conclusions: In 2013, influenza caused substantial morbidity and mortality in SP. Among SARS inpatients with confirmed influenza B, 47% were < 20 years of age.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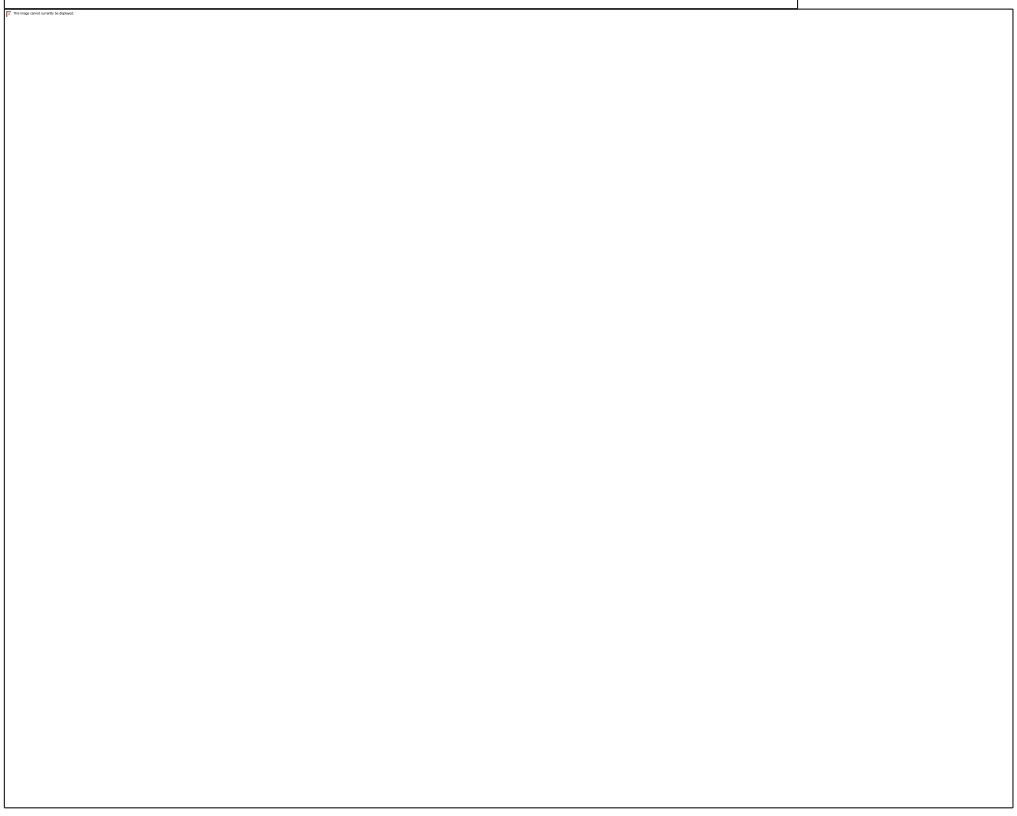
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ESPID-0864

ASCERTAINMENT OF PNEUMOCOCCAL VACCINATION STATUS AMONG CHILDREN <2 YEARS OF AGE WITH INVASIVE PNEUMOCOCCAL DISEASE IN GERMANY

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Background and aims:

In 2006, a general recommendation for vaccination with pneumococcal conjugate vaccine (PCV) for children <2y was issued in Germany. Here, we report on the pneumococcal vaccination status of children <2y with invasive pneumococcal disease (IPD) in the years 2006-2013.

Methods:

The German National Reference Center for Streptococci has been collecting pneumococcal isolates of IPD in children since 1997. Entries were reviewed for their vaccination status. Missing data were obtained by written request from the treating pediatricians.

Results:

Among 756 entries, vaccination data could be obtained for 395 cases. Of these, 267 (67.6%) were vaccinated; PCV7: n=59 (22.1%), PCV10: n=23 (8.6%), PCV13: n=115 (43.1%), PCV7/13: n=9 (3.4%), PCV10/13: n=2 (0.7%), vaccine unknown: n=59 (22,1%).

In 2011-2013 a total of 50 children had IPD caused by a PCV13 serotype. Of these 25 (50%) were not vaccinated (<2mo: n=2, 2-4mo: n=14). In 11 (22%) children vaccination was incomplete, mostly lacking the booster dose (n=8). In eight children IPD occurred after vaccination according to schedule, of which three had received all four doses including the booster dose (PCV13: serotypes 3, 19A, PCV10: serotype 19F. In six cases the vaccination status could not be obtained.

Using the indirect cohort method a vaccine effectiveness (VE) of 80% could be calculated for PCV13 (at least one dose) for the period 2011-2013 for children <2y.

Discussion:

The first results of this study show a high VE for PCV13 for IPD in children <2y. It is remarkable that over 30% of children <2y are not vaccinated.

ESPID-0865

QUANTIFICATION OF VIRAL DNA IN WHOLE BLOOD IN THE MANAGEMENT OF NEONATAL HSV INFECTIONS

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Background and Aims: Herpes simplex virus (HSV) infections in neonates are rare but potentially life threatening. In adults, serial quantitation of HSV DNA in whole blood has been shown to be helpful in management of adult HSV-hepatitis, but its utility in neonatal infections is unknown. We developed an in-house quantitative PCR to measure HSV-1 and HSV-2 DNA for aiding the diagnosis and management of neonates with HSV infections.

Methods: HSV viral load in whole blood was determined in neonates with disseminated infection (n=4), and compared to levels in neonates with only skin, eyes and mouth (SEM) or encephalitis (n=3).

Results: HSV viral load in blood was found to be of a higher magnitude at clinical presentation in neonates with disseminated disease compared to SEM or encephalitis (median of 10^8 vs. $10^{2.8}$ copies/ml). HSV viraemia correlated well with plasma liver enzyme level, and decreased with anti-viral treatment.

Conclusions: Quantitation of HSV DNA in blood can possibly be used to differentiate various HSV manifestations, monitor the development of disseminated HSV and the response to antiviral therapy. Prospective surveillance of HSV viraemia may positively impact on the management and prognosis of disseminated neonatal HSV infections.

ESPID-0866

PERFORMANCE OF QUANTIFERON-TB GOLD IN-TUBE ASSAY FOR THE DETECTION OF LATENT TUBERCULOSIS IN CHILDREN WITH RHEUMATIC DISEASES REQUIRING IMMUNOSUPPRESSIVE THERAPY

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Introduction-Objectives: To evaluate the performance of the Quantiferon-TB Gold In-tube assay (QFT-IT) for the detection of latent tuberculosis (LTBI) in children with rheumatic diseases requiring immunosuppressive treatment, including those undergoing LTBI screening prior to the initiation of anti tumour necrosis factor (TNFα) treatment.

Methods: A total of 79 consecutive children treated for rheumatic diseases were tested using tuberculin skin test (TST) and QFT-IT. Influence of age, TNFα inhibitors, systemic corticosteroids, conventional disease modifying anti-rheumatic drugs (DMARDs) and total duration of therapy on mitogen-induced interferon-γ (IFNγ) secretion was evaluated.

Results: There was no significant association between age or duration of treatment and the magnitude of IFNγ mitogen response, however treatment with TNFα inhibitors was significantly associated with increased IFNγ mitogen level compared to monotherapy with conventional DMARDs only (p=0.038). The use of systemic corticosteroids added to conventional DMARDs therapy was associated with decreased IFNγ mitogen level compared to monotherapy with conventional DMARDs (p=0.19). Rate of indeterminate results was low (2.5%). Agreement between TST and QFT-IT results was poor (k= 0.38). Presence of TB risk factors was significantly associated with increased odds of having a positive IFNγ assay (p=0.04). All children tested prior to the initiation of TNFα inhibitors treatment (n=18) was QFT-IT negative and no one developed the disease during a 2-year follow up (NPV=100%).

Conclusions: Quantiferon-TB Gold In-tube assay (QFT-IT) appears more reliable than TST for the detection of LTBI in children with rheumatic diseases requiring immunosuppressive treatment. Drug regimen might influence the level of IFNγ in the mitogen control.

ESPID-0867

PATIENTS AT RISK FOR PNEUMOCOCCAL AND MENINGOCOCCAL DISEASE: ARE CURRENT RECOMMENDATIONS BEING FOLLOWED?

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Background and aims

Proper vaccination, antibiotic prophylaxis (AP) and education are crucial for prevention of severe infections in patients at risk for pneumococcal and meningococcal disease (PMD).

Methods

An observational and descriptive study was performed at a single tertiary hospital for patients <18 years at risk for PMD identified through the hospital database. We accessed by a telephone survey to vaccination status, AP and educational strategies. Data were compared with the 2013 IDSA Clinical Practice Guideline for Vaccination of the Immunocompromised Host.

Results

Sixty-eight patients (mean age: 12.6 years) at risk for PMD were identified. Risk conditions were splenectomy (73.1%), sickle cell disease (16.4%), atypical hemolytic uremic syndrome with mutations in complement regulatory genes (10.5%) and complement deficiencies (1.5%). Thirty-seven patients (54.4%) were contacted and accepted to participate. Eight per cent had previous history of invasive pneumococcal disease. *Haemophilus influenzae* immunization was appropriate for all patients, but only 81% and 35% were correctly immunized for meningococcal C and pneumococcal disease. Meningococcal conjugate quadrivalent vaccine was used in 19%. No patient had information about the new meningococcal B vaccines. Annual influenza vaccination coverage was 67.5%. AP regimen was considered appropriate in 56.6% patients. Seventy-three per cent of patients carried information about their condition; 46% followed recommendations in case of fever and have been instructed for proper vaccination in case of traveling.

Conclusions

Recent recommendations for patients at risk of PMD are being partially followed. Patient information and education, use of appropriate AP regimens and immunization status should be updated.

ESPID-0868

EVALUATION OF MEROPENEM USE IN THE NEONATAL INTENSIVE CARE UNIT (NICU) FROM AN ANTIMICROBIAL STEWARDSHIP (AMS) PERSPECTIVE

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Introduction:

Judicious use of antimicrobials is important to limit the emergence of antibiotic-resistant organisms. This is particularly important in the setting of NICU where the use of broad spectrum antimicrobials is frequent.

Objectives/ Aims:

Our objective is to characterize meropenem use as a potential target for NICU-specific AMS initiatives.

Methods:

A retrospective study using clinical, microbiology and pharmacy data over a three-year period was performed to review the adherence to the predetermined criteria defined by the *Centres for Disease Control & Prevention 12-Step Campaign to Prevent Antimicrobial Resistance* with regard to meropenem use, in the NICU.

Results:

39 babies receiving 57 meropenem courses totalling 525 antibiotic-days were identified during the study period of July 2010 to June 2013. There was a trend of increased meropenem use over the three-year period (p=*0.042*). 10 of the 57 (17.5%) courses were considered to be inappropriate. There was no difference in demographic characteristics (gestational age, birth weight, gender, inborn vs. outborn) among infants deemed to have received meropenem appropriately versus inappropriately. Areas of non-adherence to the modified CDC 12-Step Campaign principles include not targeting a known pathogen; not streamlining to a narrower agent once pathogen identified; not obtaining /processing microbiology specimens. In addition, there was redundant antimicrobial spectrum coverage with combination use of meropenem and metronidazole for anaerobic organisms in 5 babies totalling 21 antibiotic-days.

Conclusions:

Inappropriate meropenem prescription and redundant anaerobic coverage was not uncommon in the NICU setting. We have identified an important target for AMS initiatives in NICU.

ESPID-0870

C-REACTIVE PROTEIN AND PROCALCITONIN FOR DETECTION OF BACTERIAL INFECTION IN FEBRILE CHILDREN

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*Aim: assessment of diagnostic values of C reactive protein (CRP) and procalicitonin (*PCT) for differentiation of viral and bacterial infections in febrile children aged 3 to 36 months.

We investigate 68 patients admitted in ambulatory department of Iashvili central children's hospital in Tbilisi, Georgia, with temperature > then 38,5 °C, and clinically undetectable source of fever. We conduct assessment of fever duration, clinical history, clinical condition based on Yale observation scale (YOS) and laboratory data: total blood count with formula, quantitative plasma values of CRP and PCT, urinalysis, in 47.1 % of cases (n=44) chest radiograph data.

In 23,1 % of cases (n=16) were diagnosed bacterial infection (11 cases of pneumonia, 4 cases of urinary tract infection, 1 meningitis). Mean YOS scores were significantly higher in children with bacterial infections ($p<0,005$). CRP as well as PCT show more sensitivity and specificity in determining bacterial infection than TBC and band neutrophill count. PCT concentration <0.5 ng/ml and CRP levels <40 mg/L almost ruled out bacterial infection. In infants in whom the duration of fever was <24 h, the diagnostic performance of PCT was also greater than that of CRP, but the data was not statistically significant, that can be explained by small sample size.

Conclusions. YOS, CRP and PCT can be used for prediciting bacterial infection in children with fever. PCT and CRP tests may be useful tools for emergency and private practice doctors and should be considered in the initial work-up of children with fever without source.

ESPID-0871

COMPARATIVE STUDY OF IMMUNE RESPONSES TO THE HIVIS DNA VACCINE AMONG CHILDREN AND ADULTS

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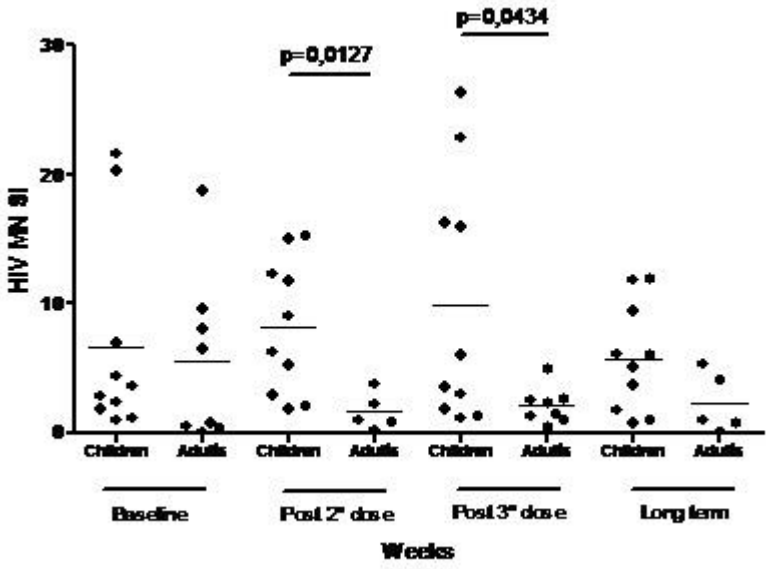
Background and aims: Therapeutic HIV immunization is intended to induce new HIV-specific cellular responses and to reduce viral load, trying to permit antiretroviral drugs free periods. A multigene, multisubtype HIV-DNA vaccine (HIVIS) was used in clinical trials with the aim to improve the immune responses of the infected individuals. In this study we compare the immune responses to the HIVIS-DNA vaccine among children and adults.

Methods: Twelve HIV-infected adults were vaccinated, followed by repeated structured treatment interruptions (STI) of their antiretroviral treatment (ART). Ten vertically HIV-infected children (4-16 ys) were immunized during ART. Humoral responses were monitored; ELISpot, limphoproliferative assay (LPA) and intracellular staining were used to evaluate specific cellular responses.

Results: The HIV-DNA vaccine was well tolerated, without serious adverse events. In adults IFN-gamma ELISpot showed improved cellular immune CD8+ reactivity, particularly to Gag peptides. No augmentation of HIV specific lymphoproliferative responses was detected. In children an increased specific immune response to Gag and RT proteins was detected by LPA (Figure 1). The frequency of HIV specific CD8+ lymphocytes releasing perforin was higher in the vaccinees than in controls, and no virological failures were detected.

Conclusions: HIVIS-DNA vaccine elicits new HIV-specific cellular responses. Children mounted a stronger HIV-specific immune response compared to adults. Therefore, the HIV-DNA immunization appeared to induce better novel cellular responses in HIV-infected individuals, and the neonatally infected children responded

as well as or better than infected



adults.

ESPID-0872

IMPACT OF LENGTH OF STAY IN THE PEDIATRIC INTENSIVE CARE UNIT PRIOR TO CATHETERIZATION ON DEVELOPMENT OF CENTRAL LINE-ASSOCIATED BLOODSTREAM INFECTIONS: PROSPECTIVE 2 YEARS STUDY

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Introduction: The impact of length of stay in the Pediatric Intensive Care Unit (PICU) prior to catheterization (LOSp) on the development of central line-associated blood stream infections (CLABSIs) is not adequately studied.

Aim: To examine the impact of the prior length of stay (LOSp) on CLABSIs development.

Methods: We prospectively studied all short-term only central venous catheters (cvcs) for two years. Group 1 (n=101) consisted only of the first cvc put in the PICU by experienced personnel under strict control and Group 2 (n=100) consisted of second and subsequent cvcs used in the same period. Catheter maintenance was done under the same bundles of care. Duration of catheterization was as long as possible, given that cvcs were functional without evidence of local or systemic infection.

Results: Two hundred one catheters were inserted and 18 CLABSIs were detected in 1809 catheter days, given a total CLABSI rate of 9.95:1000. Duration of catheterization was similar in both groups (8.46 ± 4.91 vs. 9.53 ± 5.60 days, mean ± SD, p=0.158). Three CLABSIs in 855 catheter days were developed in Group 1 (3.50:1000) vs. 15 CLABSIs in 954 catheter days in Group 2 (15.72:1000, p=0.003). LOSp was statistically higher in Group 2 (14.27 ± 16.72 vs. 0.7 ± 1.10 days, p=0.000).

Conclusions: LOSp seems to play a major role on CLABSI development in PICU patients. CLABSIs in Group 1 follows the international standards whereas CLABSIs in Group 2 corresponds to the necessity of repetitive catheterizations and the prolonged PICU stay during critical illness.

ESPID-0875

NOVEL BIOMARKERS FOR THE DETECTION OF TUBERCULOSIS IN CHILDREN IDENTIFIED BY TRANSCRIPTOMIC PROFILING OF STIMULATED PERIPHERAL BLOOD MONONUCLEAR CELLS

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Introduction and Aims:
Tuberculosis (TB) remains a leading infectious cause of death particularly in children where the conventional diagnostic methods appear to be less useful. The aim of this study is to provide new insight into the host immune mechanisms of childhood TB and to identify unique gene expression signatures that would be able to distinguish TB from latent TB infection (LTBI) and from other respiratory infections.
Methods:
RNA was recovered from peripheral blood mononuclear cells (PBMCs) from children with TB (n=15) LTBI (n=18), pneumonia (n=13) and healthy controls (n=15) that were cultured for 24 hours with either PPD (purified protein derivative) or Mtb-specific antigens (ESAT6/CFP-10) or media alone. Whole genome microarray analysis was performed in order to detect differentially expressed genes between the comparator groups. Variable selection methods were employed to identify the smallest sets of genes that could be used as the best biomarkers of TB disease.
Results:
We identified distinct subsets of differentially expressed genes when comparing TB to LTBI, TB to pneumonia, TB to controls, with and without stimulation. The variable selection methods provided us with minimal signatures which were subsequently used for classification. The PPD stimulation appeared to induce more powerful PBMCs immunological responses.
Conclusions:
Transcriptional profiling of the stimulated PBMCs revealed minimal gene expression patterns able to discriminate between TB and LTBI and between TB and other phenotypically similar respiratory infections. The study provides additional information about the paediatric immune responses to Mtb
infection and suggests that a minimal gene set could be used as a biomarker for the diagnosis of childhood TB

ESPID-0876

PERSISTENT PNEUMONIA IN A CHILD WITH PULMONARY LYMPHOID HYPERPLASIA

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Introduction: Primary and secondary immunodeficiencies are frequently characterized by recurrent infectious disease, but also they may occur with lung immune disregulation, such as follicular bronchiolitis, nodular lymphoid hyperplasia, reactive lymphoid infiltrates and LIP (lymphocytic interstitial pneumonia). They are all forms of pulmonary lymphoid hyperplasia (PLH).

Case: E. is a children of three years old with an history of recurrent respiratory infections and persistent right basal pneumonia refractory to antibiotic. CT showed parenchimal consolidation at mean-basaline right side, with mediastinal adenopathy. He presented partial clinical improvement after intravenous antibiotic therapies and respiratory physiotherapy with a slight reduction of the radiologic picture. Mediastinal lymph node biopsy evidenced an histology compatible with reactive lymphadenitis. Pulmonary biopsy results reported the presence of interstitial lymphoid aggregates that were predominantly adjacent to bronchioles and lymphoid follicles with B and T-cell, while broncoscopy examination showed diffuse lymphoid hyperplasia with extrinsic obstruction of bronchus average. All this was compatible with lymphoid hyperplasia with images of follicular bronchiolitis. Immunological evaluations revealed a deficit of CD4+ lymphocyte. Viral and microbiological analysis on blood were negative including research for mycobacterium spp. Microbiological and virological research on lung were negative except for the presence of H. influenzae as bacteric superimposed inflammation. Examinations made on bronchoalveolar lavage resulted positive for C. albicans and HHV-6.

Discussion: PLH represents a group of chronic inflammatory lung diseases, consequence of dysregulated immune response. They have been successfully treated with immunosuppressive therapy. Before starting treatment, however, is necessary to exclude infectious causes.

ESPID-0877

COMPARISON OF ANTIBIOTIC RESISTANCE PATTERNS OF S.PNEUMONIAE CARRIAGE ACCORDING TO THE SOCIAL STATUS IN BRASOV, CENTRAL ROMANIA

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Background: children from Brasov, central Romania are known for a high resistance pattern at antibiotics in nasopharyngeal carriage.

Aim of the study: to compare antibiotic resistance pattern in carriage of *S. Pneumoniae* in five consecutive years (2009-2013).

Patients and metods: a prospective study of two children population, one of middle to high income class, one of lower income population, both carring pneumococcus. The study comprised of 183 children, admitted at the University Childrens Hospital Brasov, Romania.

Results: in the study group there were 55.26% low income, 44.74% middle/high income children. There were 62.3% of pneumococcus carriers. Median value of leucocytes were 11880/mm^3 for middle and 13.940/mm^3 for low income children ($p<0.05$). Sensibility during the study years was for the low income children, for penicillin: under 3 month old in 2009 50%, unchanged for 2013; 3-6 month old in 2009-25%, in 2013-72%; 6-12 month group unchanged 60%; over 12 month unchanged 60%. Pneumococcus sensibility to Chloramphenicol was 37.50% during the 5 years of study for 3-6 month old, 47.73% for the 6-12 month, 62.50% for the 12-24 month and 66.67% for over 24 month. Ceftriaxon sensibility over 24 month 2009-41,67%; 2012-40%, 2013-58.33%. For the middle and high income group the sensibility was as follows: for penicillin 3-6 month 2009-50%, 2013-67,66%, 6-12 month 2009-100%, 2010-25%, 2013-27,27%, 12-24 month: 2009-40%, 2013-40%, over 24 month 2009-40%, 2012-33.33%, 2013-40%, chlormaphenicol 2009-100%, 2013-50%, ceftriaxon 2009-41.7%, 2013-38,24%.

Conclusion: there is a trend of increasing resistance towards antibiotics especially ceftriaxone during the study period.

ESPID-0878

HIV DRUG RESISTANCE IN CHILDREN BEFORE INITIATING COMBINED ANTI-RETROVIRAL TREATMENT

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Reports on primary HIV drug resistance in children have led to the recommendation that all children should undergo resistance testing before initiating combined anti-retroviral treatment (cART). We aimed to describe the presence of primary anti-retroviral (ARV) resistance among HIV-infected children assisted at our hospital.

HIV-infected children diagnosed since the year 2000 with a genotypic drug resistance test performed prior to initiating cART were selected.

Thirty-three infected children were enrolled: age at diagnosis from birth to 16-year-old; 54.5% female; 32 HIV-1 (59.4% subtype G or AG), 1 HIV-2; 20 from Portugal and 13 coming from Lusophone Africa. Mother-to-child transmission occurred in 27 (81.8%). At genotype testing, the median viral load (VL) was $\log_{10}$ 5.47. No information was available on mother's drug resistance tests.

Drug resistance was present in 5 (15.2%) patients, including 3 out of 13 newborns that were submitted to ARVs during gestation, labor and/or neonatal prophylaxis. Resistance to lamivudine (M184V) was present in 2 out of 6 cases submitted to lamivudine; no resistance to zidovudine (9 in monotherapy, 4 in cART) or nevirapine (2 in cART) was found in the cases submitted to these ARVs.

The overall rate of primary drug resistance in our population was not despicable. Interestingly prophylactic zidovudine in monotherapy was not responsible for subsequent zidovudine resistance.

Since few ARVs are authorized for use in early newborn period, monitoring resistance on mothers with detectable VL and children who became infected will help on establishing better prophylactic schemes.

ESPID-0879

INFLUENZA B CIRCULATION IN BRAZIL AND CHARACTERIZATION OF 75 B STRAINS ISOLATED FROM PATIENTS FROM SÃO PAULO STATE, BRAZIL (2002-2013)

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Background and objectives: The influenza vaccines effectiveness is higher when circulating strains match those included in the vaccines. Information about influenza B lineages circulating in Brazil is limited. This study aims at describing the circulation of influenza B strains in Brazil in a post pandemic period, and to compare the B lineages identified in São Paulo State (SP) with those included in trivalent influenza vaccines.

Methods: We reviewed data on A and B strains identified in SARS inpatients recorded in SINAN database (2010-2013), and information about B strains detected in 5 states during 2013. Information about B lineages was provided by Institute Adolfo Lutz only for SP. We compared circulating influenza lineages identified in SP (2002-2013) with those recommended by WHO for the Southern Hemisphere vaccine to detect any mismatch.

Results: Since 2009, the predominant influenza strain identified in Brazil has been A(H1N1)pdm09. In 2013, the highest number of influenza B strains isolated from SARS inpatients and death cases were recorded in SP. The distribution of 75 influenza B viruses detected in SP by lineage and year reported in Fig. 1, and mismatch with trivalent influenza vaccines is represented in Fig. 2.

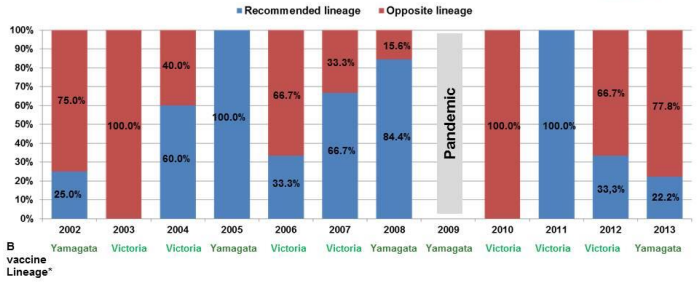
Conclusion: In 50% of seasons, there was a mismatch of circulating strains identified in SP with those included in the vaccine. More information is required on influenza B lineage strains circulation and impact to define future immunization strategies.

Fig 1. Distribution of 75 influenza B viruses by lineages (Yamagata and Victoria) and year, São Paulo State 2002-2013

Year*	B/Yamagata	B/Victoria	Total
2002	2	6	8
2003	1	-	1
2004	2	3	5
2005	4	-	4
2006	2	4	6
2007	1	2	3
2008	27	5	32
2009	Pandemic	Pandemic	Pandemic
2010	3	-	3
2011	-	1	1
2012	2	1	3
2013	2	7	9
Total	46	29	75

Source: DVRESP/Adolfo Lutz Institute and WHO.
*Lineages included in influenza vaccines for southern hemisphere according to WHO (http://www.who.int/en/).

Fig 2. Mismatch rate (%) between 75 influenza B strains and B lineage included in trivalent influenza vaccine recommended for Southern Hemisphere, São Paulo State 2002-2013



Source: DVRESP/Adolfo Lutz Institute and WHO.
*Lineages included in influenza vaccines for southern hemisphere according to WHO (http://www.who.int/en/).

ESPID-0880

GOOGLE TRENDS AS NATIONAL ROTAVIRUS SURVEILLANCE TOOL

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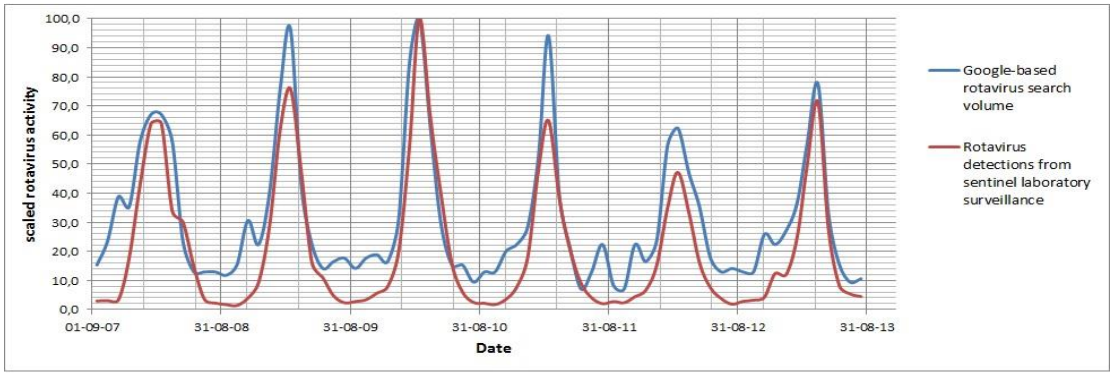
Introduction: Relative search volumes for specific internet search-queries have proven useful in surveillance of several diseases, demonstrating high correlation with national population disease activity as measured by traditional surveillance methods.

Aim: To evaluate the correlation between relative frequencies of Google-based rotavirus search queries, and rotavirus activity measured through traditional surveillance, based on number of rotavirus detections in Dutch sentinel laboratories.

Methods: Monthly data on relative volumes for the search terms ‘rotavirus’ and ‘rota virus’ were collected form Google Trends for the period from September 2007 - September 2013 for the Netherlands and compared with national laboratory data for the same period. Pearson correlation coefficient was calculated and the association between Google Trends and laboratory time-series was investigated using a multi-lag linear threshold model, while accounting for seasonal and secular trends.

Results: Google-based rotavirus search volume showed a strong correlation with laboratory detections for rotavirus ($r= 0.92$, $p<0.001$). A 5% increase in relative search volume was associated with an increase in rotavirus detections of 3.8% (IRR:0.76, 1.96; 95% CI:0.65-0.87).

Conclusions: Google-based rotavirus search volume, as summarized in Google Trends, correlates well with the Dutch traditional rotavirus surveillance. Google Trends could be a useful, inexpensive and simple tool for surveillance of rotavirus disease activity in the population.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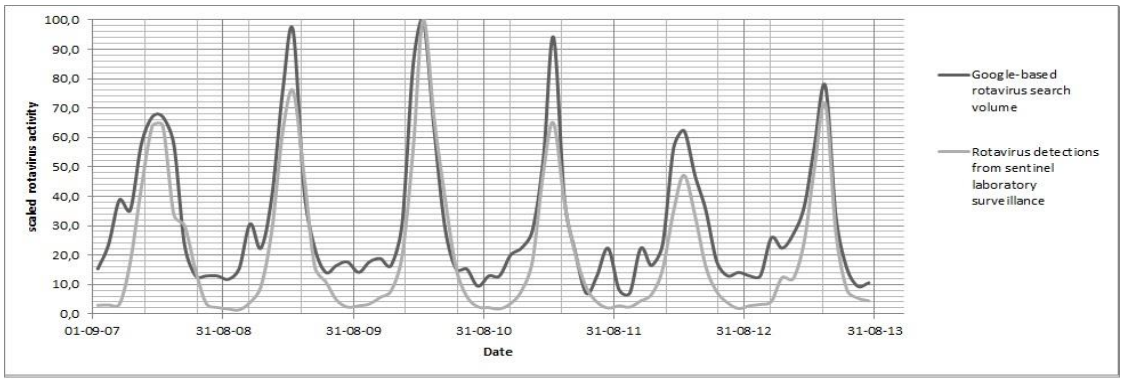
Google-based rotavirus search volume
Rotavirus detections from sentinel laboratory surveillance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Google-based rotavirus search volume
Rotavirus detections from sentinel laboratory surveillance

ESPID-0881

STREPTOCOCCUS PYOGENES: A SEVERE FORM OF PRESENTATION

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Introduction*: Streptococcus pyogenes* (GAS) is responsible for a wide variety of infections and a large range of severity.

Case Report: We report a case of a thirteen years old boy, previously healthy, without anti-pneumococcal vaccination, that was admitted into the Emergency Department with a history of fever with two days of evolution associated with pain, swollen and warmth of the right eyelid with progressive worsening. Periorbital cellulitis and maxilar sinusitis were diagnosed and further investigation revealed leukocytosis with neutrophilia and elevated C-reactive protein (217 mg/L). However, due to worsening prostration and severe headache with positive meningeal signs, he underwent a brain CT scan and lumbar punction, both consistent with bacterial meningitis. He started a 3ª generation cephalosporin and vancomycin.

His neurologic condition got worsened with onset of hypotension, shock and multiorgan failure, which triggered hospitalization in intensive care unit. However, he maintened fever and elevated inflammatory parameters, so the therapeutic was changed to meropenem. GAS was isolated in blood and cerebrospinal fluid, so penicilin and clindamycin were iniciated with clinical and analytical improvement. He completed six weeks of treatment with antibiotics and rehabilitation medicine, with complete reversal of flaccid tetraparesia. At this point, he has a normal examination, with no sequela.

Conclusion: This case is a good example of the severe manifestations of GAS infections and although invasive disease remains relatively uncommon, we need to recognize it, for early and aggressive treatment to prevent the complications.

ESPID-0882

PNEUMOCOCCAL CONJUGATE VACCINATION RATES IN INFANTS AND TODDLERS IN THE BIRTH COHORT 2010/2011 IN GERMANY

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Background: Since July 2006 pneumococcal conjugate vaccine (PCV) is recommended for children up to 24 months by the recommending body (STIKO) in Germany. Immunization includes 4 doses (a single dose at completed 2nd, 3rd, 4th and between 11th–14th month of age). Only limited data are available on vaccination rates and timing in Germany. Aim of the study was to assess vaccination rates and timeliness of PCVs in infants and toddlers.

Methods: Based on a retrospective, descriptive analysis of a representative sample of claims data in terms of age and gender of the German population with at least 4 million individuals, vaccination claims for PCVs in children born 01.01.2010 – 31.12.2010 (cohort_1) and 01.01.2011 – 31.12.2011 (cohort_2) were assessed. Follow-up was 24 months (cohort_1) and 12 months (cohort_2). Data for cohort_2 are shown in brackets.

Results: Altogether, 9.9% (10.7%) of the children remained completely unvaccinated. 90.1% (89.3%) of children received at least one dose. 87.2% (87.0%) received a second and 84.1% (79.1%) a third vaccination. Only 68.6% of children received a 4th dose until 24th month of life.

Only 25.6% (26.9%) of children received the first PCV as recommended by STIKO. 19.7% (20.3%) of second and 13.2% (13.8%) of third doses were on schedule. The fourth vaccination was administered as recommended in 27.9%.

Conclusion: Six years after universal recommendation, PCV vaccination in Germany is still incomplete, leaving 10% of children completely unvaccinated. Application of primary doses is delayed in the majority of children. Only 68.6% of children received the recommended 4th dose.

ESPID-0883

PERINATAL TUBERCULOSIS: SHALL WE STILL THINK OF IT?

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Background and aims

Perinatal tuberculosis (PT) is an uncommon manifestation with a high morbidity and mortality rate. Symptoms are often nonspecific and diagnosis may be complicated.

Methods

We describe a case of PT diagnosed in 2013.

Result

A 45-day-old female infant, coming from Marocco, was admitted with a progressive respiratory failure. She was born preterm (31 weeks of gestation) and had been income since birth, with a respiratory-related sepsis with no response to broad-spectrum antibiotics.

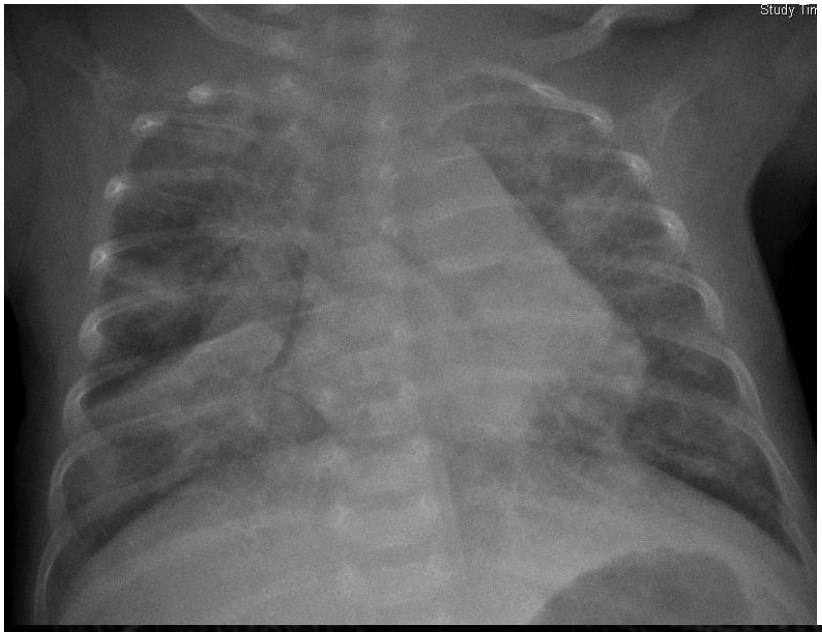
Upon admission, physical examination revealed fine rales and decreased breath sounds over both lung fields, requiring oxygen therapy. No hepatic or splenic enlargement was observed.

Blood test: WBC 15,460 cells/mm^3; C-reactive protein 153 mg/mL; normal transaminases. Chest x-ray: several consolidations in basal right and upper left lungs (Figure 1); chest CT: cavitary infiltrates (Figure 2). Tuberculin skin test (TST) was anergic, and Quantiferon® resulted positive. Bronchoalveolar lavage (BAL) was done, showing extrinsic bronchial obstructions. Mycobacterial cultures obtained (BAL) were positive for Mycobacterium tuberculosis with no drug resistance. Participation of meningeal or other sites was excluded.

Therapy with isoniazid, rifampicin, pyrazinamide and amikacin were begun and the patient gradually improved. Currently the patient is asymptomatic and is finishing the treatment.

Conclusions

PT must be suspected in neonates/infants with antibiotic refractory respiratory infections, moreover when the mother comes from a country with a high prevalence of tuberculosis.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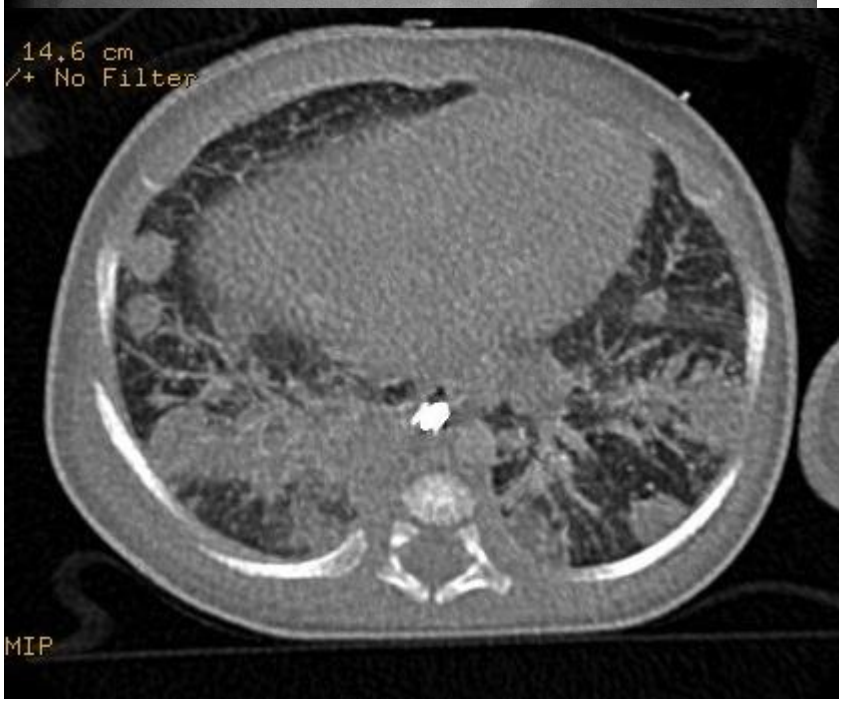
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ESPID-0884

HIGH PREVALENCE OF HSV-2 CO-INFECTION AMONG HIV-POSITIVE WOMEN IN UKRAINE, BUT NO INCREASED HIV MOTHER-TO-CHILD TRANSMISSION RISK

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C. Thorne for the Ukraine European Collaborative Study in EuroCoord[2]
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Introduction

HSV-2 co-infection may increase HIV mother-to-child transmission (MTCT) risk. We explored prevalence of HSV-2 co-infection in HIV-positive childbearing women in Ukraine and its impact on HIV MTCT.

Methods:

We used data on 1513 women with HSV-2 serostatus available, enrolled in the Ukraine European Collaborative Study from 2007-2012. We assessed the association between HSV-2 seropositivity and MTCT in logistic regression analyses.

Results:

Median age at delivery was 27 years (IQR 24-31) and 87% of women were married/cohabiting. Median last antenatal CD4 count was 460 cells/mm^3 (IQR 310-600) and 96% received antenatal ART (Table 1). Prevalence of HSV-2 seropositivity was 67.8% (1026/1513). In HSV-2-seropositive women the MTCT rate was 2.6% (95%CI 1.70-3.90), vs. 3.2 % (95%CI 1.72-5.43) in the HSV-2-seronegative group. HSV-2 seropositivity was not associated with MTCT in unadjusted analyses or after adjusting for antenatal ART type, gestational age, delivery mode, IDU, year and centre (Table 2) or among 448 women not on cART, (AOR 1.53, 95%CI 0.55-4.25).

Conclusion:

Two-thirds of HIV-infected pregnant women had antibodies to HSV-2, but had no increased risk of MTCT of HIV; however identification of antenatal HSV-2 outbreaks is crucial to prevent neonatal HSV-2 infection.

Table 1: Maternal and delivery characteristics according to maternal HSV2 serostatus

	HSV-2 seronegative n (%)	HSV-2 seropositive n (%)	Chi²	p-value
History of IDU	77/486 (16)	218/1018 (21)	6.48	0.011
HCV Co-Infection	89/433 (21)	380/969 (39)	59.37	<0.001
Mode of delivery	*n=477*	*n=1006*		
Vaginal ; elective CS ; emergency CS	277 (58) ; 180 (38) ; 20 (4)	784 (78); 176(17); 46 (5)	73.17	< 0.001
Antenatal antiretroviral therapy	*n=485*	*n=1023*		
Monotherapy; cART; sdNVP/no ART	283 (58); 183(38); 19(4)	443 (43); 542(53); 38(4)	36.29	< 0.001
Antenatal viral load undetectable†	26/145 (18)	151/655 (23)	1.81	0.18
Median viral load, if detectable	2222 copies/ml (IQR 268-14791)	3804 copies/ml (IQR 382-18374)		
STI co-infection ††	45/355 (13)	83/280 (30)	28.0	<0.001

†Last in pregnancy, a median 74 days before delivery,†† Chlamydia, gonorrhoea or syphilis

Table 2: Factors associated with MTCT of HIV N=788

	Odds ratio (95% CI)	Adjusted odds ratio (95% CI)†
HSV-2 seropositive (vs. seronegative)	1.14 (0.57-2.28) p=0.71	1.90 (0.76-4.77) p=0.17
<37 weeks gestation vs. ≥37 weeks	1.20 (0.41-3.48) p=0.74	1.13 (0.37-3.42) p=0.83
History of IDU (vs. no history)	1.50 (0.64-3.51) p=0.35	1.04 (0.41-2.66) p=0.93
Mode of delivery		
Elective caesarean section (vs. vaginal)	0.76 (0.35-1.63) p=0.48	0.71 (0.30-1.67) p=0.43
Emergency caesarean section (vs. vaginal)	0.85 (0.11-6.56) p=0.88	0.93 (0.12-7.43) p=0.94
Type of antenatal ART		
Monotherapy (vs. cART)	1.46 (0.69-3.09) p=0.32	1.49 (0.65-3.37) p=0.34
Single-dose nevirapine or no ART (vs. cART)	5.84 (2.02-16.89) p<0.01	5.65 (1.86-17.20) p<0.01

†Also adjusted a priori for centre and year of delivery

ESPID-0885

SEQUENTIAL TREATMENT FOR HELICOBACTER PYLORI ERADICATION IN A GROUP OF SPANISH CHILDREN: OUR EXPERIENCE THROUGHOUT FOUR YEARS

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1. **Introduction:** Successful treatment with triple therapy is hampered by the increase in clarithromycin-resistant strains. The emergence of new treatments, such as sequential therapy offers promising results in patients with antibiotic resistance.

2. **Objetives:** Analyze the success of eradication with sequential therapy, and secondarily describe the epidemiological and clinical characteristics of our population.

3. **Methods:** Retrospective review of all *Helicobacter pylori (*Hp) infections detected in the digestive clinic between January 2010 and December 2013; determining epidemiological features, endoscopic, laboratory and anatomopathology findings; and outcomes after treatment with sequential therapy (5 days of lansoprazole and amoxicillin followed by 5 days of lansoprazole, clarithromycin, and metronidazole). We used SPSS (version 16.0) program to analyze the data.

4. **Results** We collected 191 cases, mean age: 94.4 months (55% female). 9% had family history of Hp infection. The most frequent reason for consulting was abdominal pain (53.4%). Endoscopy finding of antral nodularity was detected in 93.7% (positive urease test 87.9%). Hp culture was positive on 62.3% with resistance as follows: clarithromycin 44,7%, metronidazole 14%, clarithromycin + metronidazole 7%, amoxicillin 0%. All patients were treated with sequential therapy, meeting eradication in 88.5% of the cases. 62,5% (5/8) of the clarithromycin + metronidazole resistant Hp failed eradication; and 50% (11/22) of the treatment failures were due to clarythromycin resistance alone.

5. **Conclusions:** We found eradication rates similar to those reported in recent prospective controlled studies. Eradication rates with sequential therapy, specially on clarithromycin-resistant strains, remains suboptimal. New agents for treatment need to be developed.

ESPID-0886

CLINICAL CHARACTERISTICS OF ALVEOLAR, NON-ALVEOLAR AND CLINICAL COMMUNITY ACQUIRED PNEUMONIA (CAP): A MULTI CENTRE STUDY

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+ on behalf of CAP-PRI (Community Acquired Pneumonia Paediatric Research Initiative) is a consortium of European countries (Greece, Israel, Italy, Lithuania, Romania, Spain) aiming to study CAP.

Keywords: pneumonia, children, hospitalization

BACKGROUND: X-ray defined pneumonia is been used for epidemiological studies. The aim of this study was to define unique clinical and laboratory characteristics of alveolar pneumonia (AP) compare with non-AP and clinical pneumonia (with no X-ray findings).

METHODS: Prospective multi-centre study, children less tan 5 years of age, with CAP diagnosed in the emergency rooms of 7 different hospitals of 6 countries (Greece, Italy, Israel, Lithuania, Romania and Spain) during two seasons: 2010-2011 and 2011-2012. Demographic, clinical, radiology and laboratory data were documented. In order to avoid biases, one paediatrician classified the X rays as: AP or non-AP or X-ray with no finding (considered clinical pneumonia).

RESULTS: 1080 subjects were studied. 829 were diagnosed of AP, 84 of non-AP and 157 of clinical pneumonia. 281 (26%) were younger than 12 months, and 523 (48%) were 24+. There was more clinical pneumonia in the 24+ and non-alveolar in

infants <12 months (p=0,001). Age was an important predictor of clinical and laboratory characteristics of the pneumonia. The univariate is shown in table.

	ALVEOLAR	NON ALVEOLAR	CLINICAL	P
AGE (mean)	24.7	20.4	23.4	
COUGH (%)	89.5	96.9	81.1	α, β γ
ABDOMINAL PAIN(%)	12.1	7.1	7.2	α, β **(0.07)**
VOMITING (%)	27.7	18.4	16.2	β
DURATION OF FEVER (DAYS) (mean (SD))	3.8 (3.8)	2.6 (2.3)	2.7 (2.0)	α, β
Hospitalization (%)	84.6	80.6	78.3	β
Resp rate (>50 in <2yoa) (%)	48.3	33.3	35.6	α, β
Resp rate (>40 in >2yoa) (%)	45.0	62.2	62.7	α, β
LEUCOCYTES (mean(SD))	17.76 (8.54)	15.16 (5.99)	13.18 (5.89)	α, β
NEUTROPHYLS (mean(SD))	11.53 (7.5)	9.2 (5.13)	7.36 (4.7)	α, β

α =differences AP vs Non-AP, β =differences AP vs CLINICAL; γ =differences Non-AP vs CLINICAL

There was no difference in the ESR and Procalcitonin when available.

CONCLUSIONS: Clinical pneumonia tended to be less severe, with less hospitalization, while alveolar is a more severe pneumonia and occurs in older subjects.

ESPID-0887

PATTERN OF NEWER ANTIFUNGAL DRUG UTILIZATION IN PEDIATRIC DEPARTMENTS IN A TERTIARY LEVEL HOSPITAL

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Background: Knowledge of antifungal utilization is necessary for implementation of antifungal stewardship program.

Objectives: We assessed the pattern of newer antifungal utilization in hospitalized children.

Methods: Retrospective observational study conducted in 2 general pediatric departments with different divisions (GPD), a pediatric oncology (PONCO) and a PICU during one year. Antifungal prescriptions were identified from Pharmacy, and patients' data recorded from medical records. Prescriptions for neonates and for fluconazole, itraconazole or deoxycholate amphotericin B were excluded. Targeted and empirical therapy was defined as antifungal therapy started on/after a definite or possible/probable fungal infection, respectively. Prophylaxis was administered to patients on high risk for fungal infection.

Results: 55 antifungal courses (37 in PONCO, 16 in PICU, 2 in GP) were administered in 41 children (md 7 yrs, 21 males). Voriconazole was used in 69.1% of antifungal courses, lipid amphotericin B formulations (LAMB) in 27.3%, caspofungin in 7.3%, posaconazole in 3.6% and micafungin in 1.8%. In PONCO, antifungals (voriconazole in 97.3% of courses) were administered prophylactically to 16 ALL, 10 solid organ tumor and 1 AML patients. In PICU, antifungals (LAMB in 87.5%) were used as targeted [56.3%, candidemia (31.3%), candiduria (25%)], empirical (25%) and prophylactic (18.7%) therapy. In GPD antifungals were used for aspergillosis and systemic candidiasis. The cost of newer antifungal drugs in one year was 161,223€ representing 99.4% of total antifungal costs.

Conclusions: Antifungal use (mostly prophylactic) in PONCO is the highest among pediatric departments. A stewardship program is warranted to optimize antifungal use and decrease its expense.

ESPID-0888

QUALITY OF ANTIBIOTIC MANAGEMENT PREDICTS OUTCOME IN PEDIATRIC PATIENTS WITH BACTEREMIA

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Introduction: Antimicrobial stewardship programs (ASPs) promote the appropriate use of antimicrobials by selecting the optimal medication, dose, duration, and route of administration. ASPs have the potential to reduce treatment related-costs, minimize drug-related adverse events, and limit the potential for emergence of antimicrobial resistance. However, data on the effect of pediatric ASP interventions on patient outcome is limited.

Objective: To evaluate the effect of quality indicators related to antibiotic prescribing in children with positive blood cultures on patient outcome.

Methods: A 2-year retrospective chart review (2010-2011) was performed for all episodes of positive blood cultures in pediatric inpatients prior to implementation of ASP at the Children's Hospital at Downstate, Brooklyn, NY. A logistic regression was conducted, predicting clinical failure (mortality and/or persistent bacteremia). Covariates (central venous catheter, infectious disease consult, blood culture collection prior to administration of antibiotics) were introduced first; then the 6 predictors of interest (empiric treatment choice, appropriate deescalation, targeted treatment choice, dose, frequency, duration) in forward selection fashion, using $p<0.15$ as the entry criterion. In a second model, the sum of the 6 predictor items was used instead of individual items; the Hosmer-Lemeshow lack of fit test was applied to this model.

Results: 101 episodes of positive blood cultures (age range 0-20 years) were identified. 40% of cases were treated in the NICU, 60% in pediatric inpatient units. The following major groups of bacteria were identified: 41 Coagulase-negative staphylococci, 17 *S. aureus*, 24 Gram-negative bacteria, and 2 Group B streptococci. In the first analysis, the 3 covariates had no joint predictive utility ($p=0.486$). Two of the 6 predictor items of interest were selected into the model: empiric therapy & targeted therapy. Adjusted odds ratios (95% confidence intervals) were 0.23 (0.05, 1.04) for empiric Rx ($p=0.056$), and 0.24 (0.06, 0.96) for targeted therapy ($p=0.043$). Area under the receiver operating characteristic curve for this model was 0.78, suggesting moderate predictive utility of the two items used jointly. In the model that substituted item sum for individual items, adjusted odds ratio was 1.77 (1.21, 2.58) for each 1-unit increase in predictor score ($p=0.003$); area under the ROC curve for this model was 0.75, *i.e.*, the 6-item summary performs slightly less well than the best 2 items used in additive fashion.

Conclusions: Commonly used antibiotic quality indicators are effective for identifying opportunities for ASP interventions and monitoring the impact of an ASP. There is a cumulative effect of poor quality prescribing indicators on patient outcome; the two most useful indicators are appropriate choice of empiric and targeted therapy. Our study is limited by small sample size, but suggests that effects of ASP on patient outcome need to be considered when advocating for the establishment of pediatric ASP.

ESPID-0889

IMPACT VACCINATION WITH THE NOVARTIS MENINGOCOCCAL SEROGROUP B VACCINE 4CMENB (BEXSERO®) ON NON-SEROGROUP B DISEASE BURDEN IN BRAZIL

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Background and aim: A total of 21 MenY, 30 MenW, and 72 MenC strains were collected by the Adolfo Lutz Institute, representing the total cases in Brazil during 2012 for which cultures were available. A subpanel of 36 strains (15MenY, 16 MenW-135, and 5MenC) was defined as representative the overall endemic disease burden in Brazil. The aim of this study was understand the impact of the BEXSERO®vaccinationon non-serogroup B disease burden in Brazil. **Methods:** The strains (*n*=36) were genetically characterized in terms of *fHbp*, *nad*A, *nhbA*, *porA,* and MLST. A subpanel of 4 MenC, 7 MenW and 9 MenY strains representative of the diversity and prevalence of the disease isolates was tested in the serum bactericidal assay using human complement (hSBA), and in immune serum pools from adolescents and from infants who had received the BEXSERO®. **Results:** The proportion of strains that were killed at hSBA titers ≥1:8 by the pooled immune sera from adolescents (after two doses) was 100% for MenC (4/4), 86% for MenW (6/7), and 67% for MenY (6/9). Eighty-eight percent [14/16] of killed non-B strains had pooled hSBA titers ≥1:32. Pooled infant immune sera (after three doses plus a booster) did not kill the four MenC strains, but killed 100% of MenW and MenY strains. Overall, 94% of killed MenY and MenW strains (15/16) were killed at hSBA titers ≥1:32 by pooled infant immune serum. **Conclusion:** The results showed the vaccination with BEXSERO® could have a robust impact on non-serogroup B disease burden in Brazil.

ESPID-0890

A CASE OF SEVERE TOXIC EPIDERMAL NECROLYSIS ASSOCIATED WITH HHV-6 INFECTION

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Background and aims Toxic epidermal necrolysis (TEN) is a life-threatening mucocutaneous disease, potentially involving systemic disorders and usually drug induced. There are some evidences that suggest a role of HHV-6 in the pathogenesis of this disease. We describe the case of 16-year-old girl who developed TEN.

Results A 16-year-old girl was admitted in critical clinical conditions to our Hospital with 3-day-history of headache, conjunctivitis, cutaneous eruption and dysuria, treated with different NSAIDs and antibiotics. Physical examination revealed signs and symptoms suggestive of septic status; severe widespread maculo-papular rash associated with blisters; sloughing on the face and trunk; erosions and ulcerations on oral and ocular mucosal surfaces. Nikolsky sign was extremely positive. Blood investigations showed an increase of inflammatory and cytolysis markers and a slight decrease of electrolytes values. Initial microbiological and virological examinations were performed resulting negative, excepting for detection of HHV-6 viremia. Antibiotic treatment was started due to the increased risk of infection. She was also treated with high dose i.v. corticosteroid associated with advanced dressing on cutaneous and topical treatment for ocular lesions. Noteworthy, the disease control was observed only when high dose i.v. immunoglobulin infusion was added to ongoing therapy. The clinical picture resolved with persistence of sequelae, such as cutaneous dyspigmentation and conjunctival synechiae.

Conclusions The current case suggest a role of HHV-6 infection in the severe form of TEN. Moreover, the choice of removal of suspected medications associated with intravenous immunoglobulin infusion, should be promptly considered by clinicians in patients with drug reaction’s clinical picture.

ESPID-0891

FEVER IN A 15 YEAR OLD GERMAN GIRL RETURNING FROM INDIA

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Case report:

A 15 year old Caucasian girl presented to our hospital two days after returning from a three week student exchange to India. The girl complained about fever up to 40 °C and cough for four day. On the fourth day of illness, she had further developed a generalized, maculopapular, erythematous rash (Figure 1). Clinical examination revealed further Koplik-spots (Figure 2) at the oral mucosa and bilateral conjunctivitis, white blood count demonstrated lymphopenia (0,3/nl) and thrombopenia (132/nl).

Background:

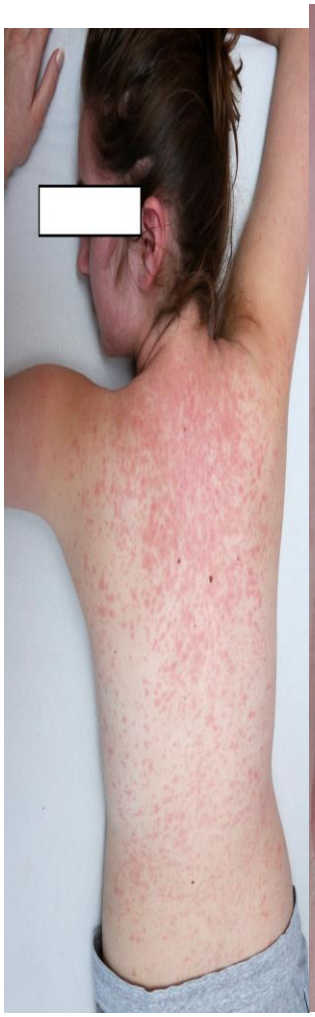
In Germany and other developed countries measles is a rare disorder due to recommended three-part MMR vaccine. In contrast, it is still highly endemic in developing countries putting unvaccinated travelers at risk. Measles vaccine, given as MMR, may be effective if given within the first 3 days (72 hours) after exposure. Immune globulin may be effective for as long as 6 days after exposure.

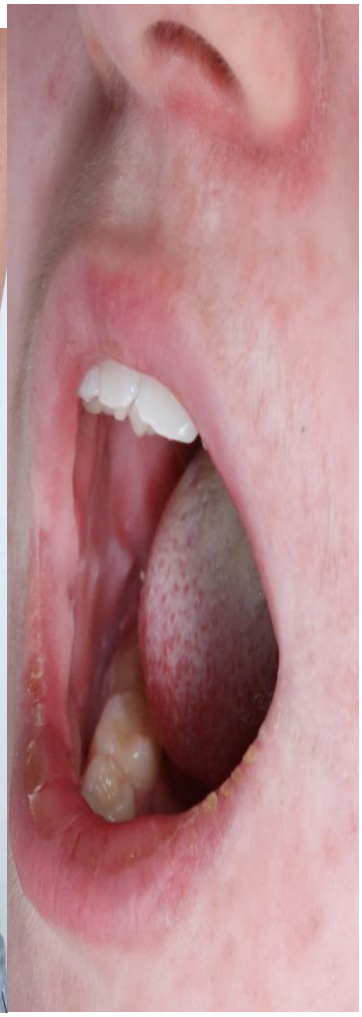
Diagnostik workup:

Dengue fever and Malaria were excluded, Elisa antibody testing and throat swap PCR confirmed an acute measles infection. The mother and two previously unvaccinated siblings were immediately vaccinated and remained healthy 14 days later.

Conclusion:

Measles are a differential diagnosis to classical tropical diseases that needs to be considered in patients returning from tropical countries. It is important to obtain the vaccination status in this patient group.





ESPID-0892

DISEASE BURDEN ASSOCIATED WITH VIRAL RESPIRATORY INFECTIONS IN PEDIATRIC ONCOLOGY PATIENTS

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AIM: A prospective observational study was conducted to examine whether viral infections of the upper/lower respiratory tract are associated with chemotherapy delay in pediatric oncology patients.

METHODS: Children presenting with respiratory tract symptoms at the "Elpida" Children's Oncology Unit in Athens, Greece were offered enrolment. Inpatients as well as children visiting the outpatient clinics were included. Patient demographic data and complete medical history was obtained. A nasopharyngeal aspirate was obtained and tested with a multiplex PCR (PneumoVir kit, GENOMICA, Spain), detecting 18 respiratory human viruses.

RESULTS: Between 11/2012-10/2013, 107 patients (54 boys) with upper/lower respiratory symptoms were included. Median age was 5.5±3.7years. Underlying malignancy included: hematological malignancy (65%), lymphoma (8%), solid tumor (26%) and Langerhans'cell histiocytosis (1%).

Viral pathogen was detected in 62% of children, the most frequent being RSV (32%), followed by Influenza, ?arainfluenza-3, Bocavirus, Rhinovirus, ?uman ?etapneumovirus and Adenovirus. Viral co-infenctions were detected in 10% of children. Median symptom duration was 7±5.5days. Most children with identifiable viral etiology (71%) were febrile. Six children (5.6%) were admitted to the PICU and 7 children (6.5%) died. Virus was detected upon enrollment in 5/6 and 6/7 respectively. Two children died due to their underlying disease, four secondary to respiratory failure and one post septic shock. Fourteen children (13%) experienced chemotherapy delay for a median of 9 days. In 9 children (64%) a viral agent was detected (p=0.54).

CONCLUSIONS: Although our preliminary results showed no association between respiratory viral infections in pediatric oncology patients and chemotherapy delay, disease burden was substantial.

ESPID-0893

PRE AND POST-SEPTAL ORBITAL CELLULITIS IN A PEDIATRIC DEPARTMENT - A 17 YEARS RETROSPECTIVE REVIEW

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Background and aims: Post and preseptal orbital cellulitis are major infections of the ocular adnexal and orbital tissues and have different approaches and clinical implications.
Methods: A retrospective analysis over a 17-year period of children admitted to a general hospital of the Lisbon metropolitan area for treatment of orbital cellulitis was undertaken. Comparison between preseptal cellulitis (preOC) and post-septal infection (postOC), with respect to their presentation, clinical and CTScan findings and treatment was made. Clinical data, diagnostic and treatment approach were also analysed in 2 time periods: 1996-2002, before diagnostic and treatment guidelines were applied (groupA), and 2003-2013 (groupB).
Results: There were 305 children identified: 241 preOC and 64 postOC, 150 groupA, 155 groupB. No differences between the two groups regarding age, gender and race were registered. Acute sinusitis was more frequent in the postOC (82,8 vs 46,9%, p<0,0001); entry points were less common than in preOC (17,2 vs 40,7%, p<0,001). C-reactive protein was higher and the antibiotic regimens were longer on postOC. Comparing the two periods, there are statistically significant differences: groupB had more photophobia, ocular pain and proptosis, more sinusitis, more postOC and less preOC diagnosis, and also longer and different antibiotic regimens, with ceftriaxone being the first choice in most of the cases.
Conclusions: The revision of guidelines led to preferential admission of more severe cases, especially those with post-septal component. When photophobia, ocular pain and proptosis are present it is necessary to exclude post-septal cellulitis.

ESPID-0894

WHY CHILDREN WITH SEVERE BACTERIAL INFECTION DIE? CONSEQUENCES AND DETERMINANTS OF SUBOPTIMAL CARES IN A POPULATION BASED STUDY

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Background and aims: Suboptimal cares are frequent in the initial management of severe bacterial infection (SBI) notably lethal ones. The contribution of suboptimal cares to death is a complex question exposed to bias and misinterpretation. Our objectives were to evaluate the consequences and determinants of suboptimal care in the initial management of SBI in children.

Study design: A population based confidential enquiry in two French adjacent departments from 2000 to 2006 included all children from 3 months to 16 years hospitalized in pediatric intensive care with SBI. Six types of cares (1 parental, 5 medical) were analyzed for each child. Two independent experts, blinded to outcome and final diagnosis, evaluated the optimality. Consequences of suboptimal cares on survival were analyzed by a logistic regression and determinants were analyzed using a multilevel logistic regression model.

Results: 21 of the included children died and 93 survived. Suboptimal cares were significantly more frequent during initial management of children who finally died compared to survivors: 24% vs 13%, p=0.004. The most frequent medical suboptimal cares were under-evaluation of severity (20%) and delayed antibiotherapy (24%). Young age (<1 year) was independently associated with higher risk of suboptimal cares whereas being under the care of a paediatric emergency or vital emergency specialist was associated with a lower risk compared to GP.

Conclusions: Suboptimal cares in the early management of SBI had a global independent negative effect on survival. These suboptimal cares could be avoided by a better training of primary cares physicians to the pediatrics specificities.

ESPID-0895

RELATION OF UPPER RESPIRATORY INFECTIONS AND ALLERGIC DISORDERS IN THE FIRST YEAR OF LIFE TO CROUP

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Background: There are many controversial data about relationship between history of frequent respiratory infections, allergic disorders and risk of subsequently developing croup. The role of upper respiratory infections and allergic disorders in the susceptibility to croup needs to be precised.

Aims: To determine the relation of upper respiratory infections and allergic disorders in the first year of life to croup.

Methods: It was investigated 524 children with a history of croup and 353 controls matched by age and sex. Standardized questionnaires were used to obtain childhood illness histories. We compared the frequency of allergy and upper respiratory infections in both groups.

Result: In 524 patients with croup a higher prevalence of upper respiratory infections was found than in 353 controls (76.6% vs 62.9%, $p<0.001$). Significantly higher were found in patients with croup compared to controls the frequent (more than 4 times per first year) upper respiratory infections (22% vz 7.6%; $p <0.001$), and allergic disorders (37.4% vs 27.1%; $p<0.05$).

Conclusion: Children with both a prior history of upper respiratory infections and allergic disorders in the first year of life may be at increased risk of subsequently developing croup.

ESPID-0896

SEVERE NOCARDIA PNEUMONIA IN CHRONIC GRANULOMATOUS DISEASE

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Background and aims:

Chronic granulomatous disease (CGD) is a genetically heterogeneous primary immunodeficiency resulting from mutations in phagocytic cell nicotinamide adenine dinucleotide phosphate (NADPH) oxidase. Patients with CGD are at risk for infections with catalase-positive bacteria and fungi. Nocardia is one of the main pathogens that affect CGD patients. Despite aggressive antimicrobial therapy, medical treatment is not always successful and surgical resection of infected tissue can be required.

Methods:

We report the case of a X linked CGD patient affected by severe *Nocardia* pneumonia who required pulmonary resection despite iv antibiotic and corticosteroids therapy.

Results:

The patient was admitted to our unit in poor clinical conditions with a 4 days history of fever and cough. Initial blood screen showed an elevation of inflammatory markers and white blood cells. Chest computed tomography (CT) scan showed a consolidation in the right middle and lower lungs with effusion. Broncoalveolar lung (BAL) cultures grew *Nocardia farcinica.* Intravenous ciprofloxacin, imipinem and linezolid were started with no clinical and radiological improvement. Thus, sistemic steroids were added for 10 weeks with defervescence. Although iv combined therapy was continued for 12 weeks, CT chest showed the persistence of severe lung lesions. Considering the radiological picture and in view of bone marrow transplantation (BMT), surgical resection was performed. After surgery he had a rapid clinical improvement and was enrolled to BMT.

Conclusions

For patients with CGD affected by nocardiosis, aggressive management with antibiotics and corticosteroids is required. Neverthless, in some cases, surgical approach should be considered.

ESPID-0897

INFLUENZA B LINEAGES CIRCULATION IN ARGENTINA IN THE PERIOD 1997-2012

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Introduction: The most important evolutionary event for influenza B virus was their differentiation in two different linages represented by influenza B/Yamagata/16/88 and influenza B/Victoria/2/87 viruses currently circulating all over the world predominating interchangeably in different seasons and geographical areas.
Objective: To analized viral circulation data from Argentina during the period 1997-2012 to know the presence of viruses of both linages in different influenza seasons and the match with influenza B component in the vaccine.
Methods: Nasopharingeal aspirates and throat or nasal swabs from pediatric and adult outpatient and inpatients with acute respiratory infection were collected and examined by immunofluorescence assay for diagnosis of influenza A and B. The annual number of samples studies was growing from 7246 in 1997 to 69000 in 2012. Influenza B samples were characterized by viralisolation and hemagglutination inhibition test.
Results: In 1997-2001 B/Yam circulated annually correlating with the vaccine component. In 2002, B/Vic strains recurred after a 14 years period of abscence impacting in children and presenting a mismatch with vaccine component. From 2003-2007 as well as in 2012 a co-circulation of Yam-Vic strains was observed while Yam strains circulated in 2008 and B/Vic strains in 2010. No B strains were detected during the 2009 pandemic year. No influenza B isolates were obtained during 2011.
Conclusions: Studies related to the disease burden of influenza B infections as well as the impact in the risk groups should be done to evaluate the necessity of vaccine prevention with strains representing both linages of Influenza B

ESPID-0898

HOW ARE SPANISH HIV PEDIATRIC PATIENTS BEING TRANSFERRED FROM PEDIATRIC TO ADULT CLINICS? FARO STUDY. CORISPE COHORT

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Our aim is to describe global situation of HIV-infected children before and after being transferred to adult units. **Methodology:** A cross-sectional study was performed in a pediatric nacional cohort. Medical charts of HIV patients transferred to adult units (1998-2012) were reviewed including demographic, clinical, immunovirological situation, comorbidities and were compared before and after transfer. **Results:** 130/346 patients transferred to adult units were included. Forty one % were males; 96% were born in Spain. Median age at the time of transition: 18 yrs (IQR: 17-19.4), median follow-up: 4.1 yrs (IQR: 1.6-5.9). 15/130 were lost to follow-up, 4 patients (3 %) died. Median CD4 nadir: 171 cel/mm3 (IQR: 62-340). Before being transferred, 86% (112/130) of patients were on HAART, 58% had undetectable HIV viral loads (VL). 20/130 (15%) were HCV coinfected, 2 (1.5%) HBV-coinfected, 32 (25%) were on C stage. HIV patients on HAART followed in adult units had higher undetectable VL rates (76% vs. 58%; $p < 0.05$) and better immunological situation compared with those achieved throughout follow-up in pediatric units (765 vs. 614 CD4/mm^3, $p<0.05$). Nevertheless, according to the year of transference, the % of patients with undetectable VL before transition increased (1998-2004: 36.9%; 2005-2008:47.4%; 2009-2012: 71.7%).In adult unit: 12 patients (9%) acquired B or C category, 10 (8%) suffered from psychiatric disorders, 4 (3 %) died (3 opportunistic infections, 1 non-Hodgkin lymphoma). Moreover, 14 women (18%) became pregnant (3 voluntary abortions, 18 non infected children).**Conclusions:** In our cohort, patients transferred into adult units show better immunovirological situation although these event are less important in the last period and could be related to better treatment options**.** Sexual education and comorbilities must be addressed in these patients.

ESPID-0900

AN UNUSUAL PRESENTATION FOR CONGENITAL CYTOMEGALOVIRUS INFECTION

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We present the case of a neonate with fœtal intestinal dilatation and hyperechogenic lesions in the right illiac fossa discovered at 26 weeks of gestation by routine antenatal ultrasounds and confirmed by fœtal magnetic resonance Imaging. Maternal cystic fibrosis genetic analyses were negative and maternal serology tests did not suggest a recent infection. Maternal IgG and IgM were negative for HSV, HAV, HBV, HCV, toxoplasma gondii, parvovirus B19, and syphilis. For rubella and CMV, IgM were also negative but with IgG were positive suggesting a previous infection. After term delivery, the newborn rapidly presented significant abdominal distension. Abdominal X-rays and ultrasounds confirmed intestinal obstruction. Surgery revealed meconium peritonitis with multiple intestinal adhésions, intestinal perforation and ileal atresia. Postoperative evolution was rapidly favourable. Complementary explorations demonstrated a normal karyotype, the absence of the most common mutations in the CFTR gene, and a negative sweat testing. Next to these explorations, a mild thrombocytopenia was observed and cerebral ultrasounds showed several periventricular cysts and hyperechogenic lenticulostriate vessels. Polymerase chain reaction CMV testings in urine, blood and cerebrospinal fluid were positive demonstrating a congenital CMV infection.

Although congenital CMV infection is often asymptomatic and usually characterised by brain, hearing and reticuloendothelial system symptoms, this case report illustrates that it may also involve gastrointestinal tract and that maternal immunization does not prevent from severe fœtal infections. Additionally, it also suggests that the incidence of congenital CMV infections may be underestimated, which raises concens for early treatment issues.

ESPID-0901

LOW MONOCYTE CD14 AND HLA-DR EXPRESSION CORRELATE WITH DISEASE SEVERITY IN RESPIRATORY SYNCYTIAL VIRUS INFECTIONS

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Introduction, objectives and aims:
RSV is a common cause of bronchiolitis in infants. Known risk factors are used to predict severity, but ~50% of all severe RSV infections are previously healthy. Besides environmental and genetic factors, their innate immune system plays an imperative role. Monocytes are an important part of innate immunity. We characterized monocytes in RSV-infected infants and correlated innate immune receptors with disease severity defined by requirement of mechanical ventilation.

Methods:
Peripheral blood mononuclear cells from RSV-infected infants were isolated during the acute and recovery phase. Immunophenotyping for CD14, CD16 and HLA-DR and *in vitro* stimulation with LPS were performed. Cytokine secretion after stimulation were determined with ELISA.

Results:
- Acute RSV infections are characterized by an increase of CD14+CD16+ cells.
- Increased CD14 expression on monocytes during acute infection is absent in severe RSV infections
- In severe RSV infections, monocytes have lower CD14 and HLA-DR expression compared to non-severe infections (table) and their PBMCs have normal TNF, but impaired IL-10 production *in vitro*.

Conclusions:
Monocytes from severe RSV infections have an impaired CD14 and HLA-DR expression. Low expression of CD14 and HLA-DR combined with the hyporesponsiveness to produce IL-10 suggest that an imbalance of innate immunity plays a role in disease severity. Our study underlines the importance of innate

immune responsiveness in severe RSV infections in young infants.

Monocyte subset	Innate immune receptor	Non-severe infections (N=11)	Severe infections (N=10)	Significance (Mann Whitney)
CD14+ CD16- monocytes	CD14 (median MFI)	10765	8620	$P = 0.006$
	HLA-DR (median MFI)	3139	1958	$P = 0.029$
CD14+CD16+ monocytes	CD14 (median MFI)	7290	6495	$P = 0.035$
	HLA-DR (median MFI)	4384	4616	NS ($P = 0.59$)
CD14-CD16+ monocytes	HLA-DR (median MFI)	2384	3815	NS ($P = 0.34$)

Table: In severe RSV infections, all CD14+ monocytes subsets have a lower CD14 expression and CD14+CD16- monocytes have a lower HLA-DR expression during acute infection

ESPID-0902

RISK FACTORS AND COMPLICATIONS IN MEASLES MORTALITIES IN PAKISTAN

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Objective:- To determine the risk factors and complications in patients expired due to measles.

Background:- Measles is a vaccine-preventable disease. Mortality and morbidity due to it has been decreased in many countries. Pakistan has faced an epidemic in 2012-13.Due to some risk factors, Pakistani children suffered from many complications.

Place & Duration: - Measles ward, The Children`s Hospital, Lahore from Feb. to June 2013

Methodology: Patients who were admitted and expired in measles ward were included. A Performa was filled to document the risk factors and complications.

Results: - 1075 patients were admitted. 44 expired. 27 were males. Minimum age of patients who expired was 3 months and maximum was 7 years. Maximum deaths were from 2-5years: 27%, followed by 6 to 9 months: 23% (10/44). 30 (68%) were malnourished having weight less than 5thcentile. 70% of the patients died with 24 hours (31/44). 82% (36/44) patients had contacts in families or society. 86% (38/44) patients were unvaccinated and only one patient received two doses (2%). 17 patients had co-morbid conditions; cystic fibrosis, dilated cardiomyopathy, complex cyanotic heart disease, Gaucher`s disease, hypothyroidism, chronic renal failure, hepatitis (3), seizures disorders, pulmonary tuberculosis, hydrocephalus, Aplastic anemia and severe nutritional anemia (3).

Complications documented were; pneumonia 100% (n=44), Encephalitis 47% (n=21), Enteritis 9% (n=4) and respiratory failure 4.5 % (n=2)

Conclusion:

Lack of vaccination is the most important risk factor, followed by malnutrition and co-morbid illness.

The most frequent complication is pneumonia followed by encephalitis.

ESPID-0905

EPIDEMIOLOGICAL AND LABORATORY FINDINGS OF COINFECTIONS ASSOCIATED WITH ACUTE GASTROENTERITIS IN CHILDREN-GREECE

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Objectives: The aim of this study is to evaluate the epidemiological and laboratory findings of coinfections associated with acute infectious diarrhea in children in the region of Thessaloniki-Greece.

Methods: A total of 297 feces specimens from patients (children, 144 male and 153 female age range: 5 days – 14 years) with acute gastroenteritis (AGE) were retrospectively studied. The patients were admitted to hospital as sporadic cases of AGE, during one year in Thessaloniki. All specimens were cultured with classical laboratory methods. The specimens were tested for *Rotaviruses*, *Noroviruses*, *Salmonella spp*, *Campylobacter spp* and *Yersinia enterocolitica*. The presence of *Rotavirus* was investigated by ELISA whereas *Norovirus* both by ELISA and RT-PCR. Data included sex, age, presence of granulocytes in feces, electrolytes serum levels, blood count, erythrocyte sedimentation rate, CRP, seasonal distribution and distribution of the population in rural and urban areas. Statistical analysis was performed by SPSS 20.

Results: Coinfections were identified in 18 cases (6.1%) (10 male and 8 female). The majority of the coinfections were reported in 1-2 years old group (11/18, 61.1% p=0.003) and occurred in cold months (November to April) (14/18, 77.8%, p=0.001). Virus-virus coinfections (Rotavirus-Norovirus 12/18, 66.7%) were more frequent than bacteria-virus coinfections (6/18, 33.3%). Rotaviruses were the most frequently found causative agent in coinfections (16/18, 88.9%). Analysis of laboratory data showed a significant difference in the mean of the absolute number of lymphocytes (L) and monocytes (M) between mono- and co-infection groups (L 3214 vs 2156 respectively, p=0.043; M 1314 vs 986, p=0.05). There was also a statistically significant difference in the occurrence of electrolytic disorders between the two groups (higher rates in coinfection group 55% vs 30% p=0.023.

Conclusions: The epidemiological findings reveal that coinfection is more frequent in the 1-2 years old age group and also during the cold months. Furthermore *Rotavirus* is the most frequent agent of coinfection. The laboratory results emphasize the clinical importance of coinfections as a cause of severe diarrhea in children. This is supported by the more severe dehydration in the co-infected patients.

ESPID-0906

PROTECTION AGAINST EXPERIMENTAL CEREBRAL MALARIA AND UNDERLYING IMMUNITY MECHANISMS AFTER PLASMODIUM WHOLE-ORGANISM VACCINATION

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Background and aims: According to WHO-estimations 473,000-627,000 people died from severe malaria in 2012. About 77% of the deaths were children below the age of 5 and mainly in sub-Saharan Africa. Preventing severe cerebral malaria in children has a great potential to save lives. In order to develop a safe and efficacious vaccine it is crucial to investigate novel potential vaccination approaches and to perform a detailed characterization of both their underlying immunity mechanisms and correlates of protection.

Methods: In the context of our studies we use *Plasmodium berghei (Pb)* ANKA in inbred C57BL/6 mice as a well-established murine model for investigating aspects of experimental cerebral malaria (ECM). Groups of mice were immunised through intravenous injection of 10,000 *Pb* ANKA sporozoites plus one single dose of Piperaquine chemoprophylaxis. 12 weeks after immunisation infection challenge followed either with sporozoites or infected red blood cells. To this end, we evaluated ECM by assessing the neurological status and the integrity of the blood-brain-barrier via Evans Blue staining. Characterization of the immune response is analysed via Flow Cytometry of specific T lymphocyte subsets. Of special interest are both CD4+ and CD8+ Effector and Central Memory T cells and their respective cytokine expression profile in the liver and in secondary lymphatic.

Results and conclusion: Mice inoculated with one single immunisation with viable and infectious *Pb* ANKA sporozoites under Piperaquine chemoprophylaxis partly enjoy protection against ECM, which seems to be correlated with elevated numbers of intrahepatic CD8+ Effector and Central Memory T cells.

ESPID-0907

LONG-TERM AZITHROMYCIN TREATMENT IN CHRONIC RESPIRATORY DISEASE: IMPACT ON STAPHYLOCOCCUS AUREUS PREVALENCE AND MACROLIDE RESISTANCE

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Background: Macrolides are widely used as add-on treatment for chronic inflammatory respiratory diseases. Particularly in cystic fibrosis (CF), it is recommended as add-on treatment in *P. aeruginosa* (PA) colonized patients. It was demonstrated that azithromycin decreases the prevalence of *S. aureus* (SA) colonization, however development of macrolide resistance in SA is a concern.

Methods: We conducted a retrospective medical file review of all CF patients, followed in the UZ Brussel CF-reference centre, with chronic PA colonization, treated with azithromycin. We reviewed sputum cultures for SA positivity and macrolide resistance at three-year intervals, starting from 2003, the year before maintenance azithromycin was introduced in our centre.

Results: Twenty-one patients were treated, with a median duration of 7(range 4.5-8.6) years. Median age of patients was 29.6(range 13-47) years. In total 526 sputum samples were evaluated (median 6/patient, range 2-11). Percentage of SA positive samples remained stable over time (p=0.33). Erythromycin and clindamycin resistance in SA isolates raised significantly over time (p=0.009 and p=0.006).

Conclusion: In contrast to previous studies, azithromycin maintenance treatment did not reduce the prevalence of SA. A dramatic increase in macrolide and clindamycin resistance was however observed. The clinical effect of increased macrolide resistance is unknown. More studies are needed to examine risks and benefits of

azithromycin treatment, in CF but also in non-CF inflammatory respiratory disease.

	Evolution over time				p for change over time
	2003	2006	2009	2012	
SA positive samples (%)	51.63±37.28	54.13±44.62	44.71±40.11	47.17±45.29	0.33
Erythromycin resistant SA (%)	35.42± 44.04	62.50±51.75	85.00±35.05	97.92±5.89	**0.009**
Clindamycin resistant SA (%)	16.67± 35.63	47.50±51.20	61.56±42.23	85.42±35.00	**0.006**

ESPID-0908

EPIDEMIOLOGY AND ANTIMICROBIAL SUSCEPTIBILITY OF GRAM-NEGATIVE PATHOGENS CAUSING INTRA-ABDOMINAL INFECTIONS (IAI) IN PEDIATRIC PATIENTS IN EUROPE – SMART 2010-2013

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Introduction: Community-associated (CA) and hospital-associated (HA) IAI are a major cause of morbidity and, if not properly treated, mortality. The Study for Monitoring Antimicrobial Resistance Trends (SMART) has tracked epidemiology and susceptibility of aerobic Gram-negative pathogens (GNP) causing IAI since 2002; this report summarizes the findings for pediatric patients in Europe during 2010-2013.

Methods: Participating hospitals each collected up to 100 non-selected, consecutive GNP each year; 1,086 isolates were collected from 52 hospitals in 18 countries. Organisms were classified as either CA or HA if they were isolated <48h or >=48h from admission, and were sent to a central laboratory for identification and susceptibility testing using microdilution, interpreted using EUCAST guidelines.

Results: The frequency and extended-spectrum beta-lactamase (ESBL) rates of the top species in HA and CA IAI are summarized in Table 1. Susceptibility was frequently lower in HA than CA versus eleven drugs commonly used in IAI.

Table 1.

	% of Isolates			ESBL Rates*		
Species (n All, HA, CA)	All	HA	CA	All	HA	CA
Escherichia coli (691, 181, 497)	64%	45%	80%	6%	9%	4%
Pseudomonas aeruginosa (97, 38, 53)	9%	9%	9%	-	-	-
Klebsiella pneumoniae (87, 62, 18)	8%	15%	3%	33%	44%	11%
Enterobacter cloacae (56, 37, 16, 3)	5%	9%	3%	-	-	-
K. oxytoca (33, 18, 11)	3%	4%	2%	6%	0%	0%
Total	89%	84%	96%	6%	11%	4%

*Based on CLSI phenotypic test; not applicable to *P. aeruginosa* and *E. cloacae*.

Conclusions: Although the top five species found in HA and CA IAI were identical, the proportion of *E. coli* was different: 45% of HA vs. 80% of CA (p<.0001). *K. pneumoniae* and *E. cloacae* were 5-fold and 3-fold, respectively, more common in HA (p<.0001 for both). Differences in species prevalence, ESBL rates, and susceptibility between HA and CA pediatric IAI indicate a need for different therapeutic options for treatment of these infections.

ESPID-0909

VACCINE-PREVENTABLE DISEASE INCIDENCE OF PNEUMOCOCCAL HAEMOPHILUS INFLUENZAE PROTEIN D CONJUGATE VACCINE (PHID-CV10) IN THE FINNISH INVASIVE PNEUMOCOCCAL DISEASE (FINIP) TRIAL

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Pneumococcal disease burden estimation is challenging due to difficulties in assigning aetiology in lower and upper respiratory infections. We estimated the total PHiD-CV10 (GlaxoSmithKline Vaccines) vaccine-preventable disease incidence (VPDI) using our clinical trial setting.

Finnish Invasive Pneumococcal disease (FinIP) trial was a cluster-randomized, double-blind trial in children <19 months who received PHiD-CV10 in 52 clusters or hepatitis B/A vaccine as control in 26 clusters according to 3+1 or 2+1 schedules (infants <7 months) or catch-up schedules (children 7-18 months). Outcome data were collected using Finnish routine health-care registers. Blinded follow-up lasted from the date of first vaccination (trial enrolment Feb-2009 through Aug-2010) to January 31, 2012 for Invasive Pneumococcal Disease (IPD, from National Infectious Diseases Register) and end December 2011 for other outcomes (non-laboratory-confirmed IPD, hospital-diagnosed pneumonia, tympanostomy tube placements (TTP) from hospital discharge register, and antimicrobial purchases from Benefits Register of Social Insurance Institution of Finland). VPDI was estimated as difference in disease incidences between PHiD-CV10 clusters and control clusters.

Altogether >47000 children were enrolled. In 30527 vaccinated infants <7 months at first dose, the VPDIs per 100000 person-years were 75 for laboratory-confirmed IPD, 205 for non-laboratory-confirmed IPD, 340 for hospital-diagnosed pneumonia, 1100 for any TTP and 12000 for any antimicrobial outpatient prescription, mainly due to otitis media.

In the European developed-country setting, over 95% of the disease episode reductions in vaccinated children were seen for mild upper respiratory infections. The VPDIs of severe diseases are lower, especially when majority of invasive disease goes undetected with routine blood-culture-based definitions.

ESPID-0910

IMPROVING THE DIAGNOSIS OF CHRONIC RECURRENT MULTIFOCAL OSTEOMYELITIS (CRMO): FINDINGS FROM A COHORT OF 41 PATIENTS

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Introduction: Chronic recurrent multifocal osteomyelitis (CRMO) is a little known inflammatory bone disease occurring primarily in children. Delays in diagnosis lead to prolonged courses of antibiotics, unnecessary radiation exposure from multiple plain radiographs or bone scans and repeated bone biopsies.

Methods: Children (<18 years) diagnosed with CRMO between January 2005 and December 2012, reviewed at Bristol Royal Hospital for Children were included and all available data collected. Information regarding CRMO was sent to all orthopaedic surgeons in the region in 2009.

Results: 41 patients were diagnosed with CRMO over the 8 year period. Symptom onset occurred at a median of 9 years with time to diagnosis 15 months median (range 0 - 92). Correlation coefficient analysis for time to diagnosis by year showed statistical significance with a decreasing trend ($p<0.05$). From the cohort data, diagnostic criteria were developed; applied retrospectively, 34 children may have been diagnosed by criterion 1, with only 6 children requiring a biopsy (criterion 2) for diagnosis.

Conclusion: The data suggest that increasing knowledge of this condition may shorten time to diagnosis. Using the Bristol diagnostic criteria (figure 1) with an experienced clinician may obviate the need for biopsy in some patients.

Figure 1: Bristol diagnostic criteria for CRMO

1. The presence of typical clinical and radiological findings in more than one bone (or clavicle alone) without significantly raised inflammatory markers

OR

2. Typical clinical and radiological findings in one bone plus inflammatory changes (plasma cells, osteoclasts, fibrosis or sclerosis on bone biopsy with no bacterial growth.

ESPID-0911

PRE-TRAVEL PEDIATRIC CONSULTATION – A 6 YEAR RETROSPECTIVE STUDY

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Background and aims: The Pediatric Department of Hospital de São Bernardo (Setúbal, Portugal) provides a pre-travel consultation for pediatric international travelers. The aim of this study was to evaluate the pre-travel health-care provided in our institution and to identify areas in which it could be improved.

Methods: We retrospectively reviewed the medical charts of pediatric pre-travel consultations from October of 2007 to October of 2013. We collected data on patients demographics, travel itinerary, prescribed travel vaccines and medications. Patients with incomplete medical records were excluded.

Results: Among the 499 patients who received a pre-travel consultation, 435 (87,2%) were included. 52% were females. The median age was 6 years. The mean time from consultation to departure was 36.4 days, although 39.7% presented very close to the date of departure (≤7 days). The number of consultations increased over the years, probably due to the rise of immigration. African countries were the most common travel destination (78.4%), specially Angola (69,5%). For 57.7%, the purpose of travelling was to visit relatives. The mean time of staying was 6.2 weeks. About 27.6% of the patients stayed longer than 6 months. The majority of those (83.3%) moved definitely. Vaccines were prescribed to 85.7% of the patients. Yellow Fever (26,8%), Hepatitis A (25,1%), Typhoid Fever (23,3%) and Cholera (19,1%), were the most frequents. Mefloquine was the most prescribed antimalarial medication (97.6%).

Conclusions: This study provides information on the pre-travel health service provided to children in our hospital, allowing us to elaborate risk-reduction strategies.

ESPID-0912

INCIDENCE AND EPIDEMIOLOGY OF INVASIVE GROUP B STREPTOCOCCUS IN INFANTS IN IRELAND, 2012–2013

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Background and aims: Invasive Group B streptococcus (iGBS) in children aged less than 90 days has been notifiable in Ireland since 2012. National incidence rates and molecular epidemiology of iGBS in infants were determined for 2012–2013.

Methods: Incidence rates were determined using iGBS notification data and 2012 national data on live births. The molecular epidemiology of 51 iGBS isolates (early onset disease (EOD)= 33; late onset disease (LOD)=18) representing 36% of all reported cases were analysed by multilocus sequence typing, serotyping and antimicrobial susceptibility.

Results: The overall iGBS incidence rates were 1.06 and 0.91 per 1000 live births for 2012 and 2013, respectively. The EOD rate was lower in 2013 (0.57 [per 1,000 live births], n=41) compared to 2012 (0.80; n=58), while the LOD rate was higher in 2013 (0.35; n=25) compared to 2012 (0.26; n=19). Predominant serotypes were III (n=23), Ia (n=14), V (n=5), Ib (n=3), II (n=3), which grouped into clonal complexes (CC)17 (n= 19), CC23 (n=14), CC1 (n=11), CC12 (n=3), CC19 (n=3). Erythromycin resistance occurred in 12 isolates (23.5%) presenting with cMLSB (n=5), iMLSB (n=4) and M (n=3) phenotypes.

Conclusion: iGBS rates in infants in Ireland 2012–2013, in particular EOD, were higher than reported in 2000–2001 (EOD and LOD were 0.34 and 0.26 per 1000 live births, respectively). This may be due in part to the introduction of statutory notification and PCR detection. However, the increased incidence and high levels of erythromycin resistance highlights the need for ongoing surveillance and review of preventative strategies.

ESPID-0913

INVASIVE GROUP A STREPTOCOCCUS (IGAS) IN IRELAND, 2012-2013: COMPARISON OF PAEDIATRIC AND ADULTS CASES

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Background and aims: Invasive Group A streptococcus (iGAS) causes considerable morbidity and mortality, with highest incidences in the young and elderly. The epidemiology of iGAS in paediatrics and adults was compared in 2012-2013: a period of increased iGAS incidence.

Methods: Clinical information was extracted from national enhanced surveillance data on iGAS notifications. GAS isolates were typed by *emm* sequence typing and antibiotic susceptibility testing.

Results: 73 (25%) and 217 (75%) iGAS cases were notified in <18 and ≥ 18 year olds. Streptococcal toxic shock syndrome and necrotising fasciitis were more frequent in adults than paediatrics (23% versus 10% [*P*=0.01] and 7% versus 3% [*P*=0.25], respectively). Two predisposing factors (varicella and skin lesions/wounds) predominated among paediatric cases, compared to a greater range of risk factors in adults, for whom skin lesions/wounds and malignancy were most predominant. 11 and 27 different *emm* types were detected in paediatric and adult cases, respectively. Top ranked *emm* types were *emm*1 (45%), *emm*3 (21%), *emm*12 (7%) and *emm*6 (7%) in paediatric cases, and *emm*1 (36%), *emm*3 (13%), *emm*89 (8%) and *emm*28 (7%) in adult cases. Antimicrobial resistance occurred in 12 *emm* types but not the hypervirulent *emm*1 or *emm*3 types. Tetracyline resistance (7%) was more prevalent in adults than paediatrics (15/174 and 1/55, respectively). Macrolide resistance (5.2%) was only detected in adult isolates (n=12/174).

Conclusion: Some *emm* type variation occurred between adults and paediatric cases. Certain risk factors, such as varicella, were more common in paediatrics. Antimicrobial resistance was more prevalent in adult cases.

ESPID-0914

EFFECTIVENESS OF THE PNEUMOCOCCAL HAEMOPHILUS INFLUENZAE PROTEIN D CONJUGATE VACCINE (PHID-CV10) AGAINST NON-LABORATORY-CONFIRMED INVASIVE PNEUMOCOCCAL DISEASE (IPD) - FINIP TRIAL EXTENDED FOLLOW-UP

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Vaccine effectiveness (VE) of pneumococcal conjugate vaccines (PCV) against culture-confirmed IPD is well documented. We recently reported first results against non-laboratory-confirmed suspected IPD using clinical hospital diagnoses. Now, we evaluated longer-term impact of PHiD-CV10 (GlaxoSmithKline Vaccines).

Finnish Invasive Pneumococcal disease (FinIP) trial was a cluster-randomized, double-blind trial in children <19 months who received PHiD-CV10 in 52 clusters or hepatitis B/A vaccine as control in 26 clusters according to 3+1 or 2+1 (infants <7 months) or catch-up schedules (children 7-18 months) in 2009-2011. We extended register follow-up for 2012 and collected hospitals' in/outpatient discharge notifications with ICD-10 diagnoses compatible with IPD (A40.3/B95.3/G00.1/M00.1) or unspecified sepsis (A40.9/A41.9/A49.9/G00/G00.9/I30.1/M00/M00.9/B95.5) from national Care Register. Laboratory-confirmed IPD cases were excluded. The main outcome was final discharge diagnosis of non-laboratory-confirmed IPD in infants aged <7 months at enrolment. The blinding was opened to public in May 2012. PHiD-CV10 was included in National Vaccination Programme (NVP) in Sep-2010 for 3-month-old children.

Altogether >47,000 children were enrolled. In 2012, 57 episodes of suspected non-laboratory-confirmed IPD or unspecified sepsis, but only 9 main outcome episodes, were found. VE against final discharge diagnosis of non-laboratory-confirmed IPD was 80% (95%CI 7 to 97) in infant 3+1/2+1 schedules combined but only 9% (-76 to 52) against any episodes with ICD-10 diagnoses compatible with IPD or unspecified sepsis.

The incidence of non-laboratory-confirmed IPD was low in the extended follow-up of children at 2 to 3 years of age during PCV-NVP era. This is the first report showing the long-term impact of PCV on non-laboratory-confirmed IPD.

ESPID-0915

IMPLEMENTATION AND EVALUATION OF A PILOT ANTIMICROBIAL STEWARDSHIP PROGRAM IN A TERTIARY CARE PEDIATRIC TEACHING HOSPITAL

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Introduction: Antimicrobial Stewardship initiatives in pediatric hospitals are recognized as critical in the promotion of judicious antimicrobial use, yet a paucity of data exists outside the adult literature. A multidisciplinary Antimicrobial Stewardship Program (ASP) with prospective audit and feedback of all antimicrobials was implemented in a pediatric hospital in September 2013. Our program emphasized collaboration with existing clinical pharmacists each responsible for promoting ASP principles, and bypassed strategies that impact prescribing autonomy to promote collegial alliance and acceptance.

Objectives/ Aims:
Our objectives are to characterize interventions and identify strategies to strengthen impact.

Methods: Retrospective descriptive study using an ASP database to review audit and feedback activity from October to December 2013.

Results: The ASP audited a mean of 29±6 patients and 43±9 antimicrobials daily. In addition to the interventions by existing clinical pharmacists, interventions were recommended for a mean of 4 patients/day and 5 antimicrobials/day. A total of 241 recommendations were made, with a higher rate of acceptance in non-critical care areas (86.6% vs. 59.7%; $p<0.001$). The most common recommendations were discontinuation of antimicrobials (41.2%), parenteral to oral stepdown (18.5%), tailor antimicrobials to culture and sensitivity results (9.9%) and optimize antimicrobial dose (9.4%). Feedback was provided most frequently for third-generation cephalosporins (28.4%), ampicillin (17%), and vancomycin (8.3%).

Conclusions: Implementation of an ASP adds value to existing clinical services and further promotes optimal antimicrobial use. The study identified areas for improvement, and collaboration with critical care areas with representative physicians in the ASP may enhance identification and acceptability of interventions.

ESPID-0917

CHARACTERISTICS OF INVASIVE-DISEASE ASSOCIATED E. COLI ISOLATES RECOVERED FROM INFANTS LESS THAN 1 YEAR OLD, IN IRELAND.

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Background and Aims: Management of invasive *E. coli* infections is increasingly threatened by the emergence of antimicrobial resistance, and the spread of the worldwide pandemic extended spectrum beta-lactamase clone, O25b:ST-131 harbouring $bla_{CTX\text{-}M\text{-}15}$. Genotypes of invasive disease-associated isolates recovered in Ireland were determined.

Methods: A total of 175 *E. coli* isolates recovered from blood or cerebrospinal fluid (CSF) of 73 infants and 102 adults were examined. All isolates were assigned to a phylogenetic group (PGG) and were screened for O25b:ST-131 status and the most common beta-lactamase (*bla*) genes using PCR.

Results: All four PGGs were observed, but PGGs B2 (73%) and D (18%) were the most common with B2 (subgroup B2.1) more associated with infants (p=0.0587) and D with adults (p=0.0464). Only 4.1% of infant and 5.9% of adult isolates were O25b:ST-131. 60% of infant isolates harboured at least one *bla*-variant gene; 52% were positive for bla_{TEM}, 6.8% for bla_{SHV} and only 1.4% for each $bla_{OXA\text{-}1}$ and $bla_{CTX\text{-}M}$ families. None of the infant PGG A isolates harboured *bla* genes in contrast to all adult PGG A isolates (p=0.003). Only one O25b:ST-131 $bla_{CTX\text{-}M}$ was identified among the 175 isolates; recovered from an infant.

Conclusions: *E. coli* of diverse genomic backgrounds are associated with invasive disease in infants, and differ from adult isolates. The proportion of O25b:ST-131 isolates and distributions of *bla* genes were similar among both isolate populations. However, there was a surprisingly low overall prevalence of O25b:ST-131 with $bla_{CTX\text{-}M}$ observed, suggesting that this clone is rare in infants in Ireland.

ESPID-0918

A CASE OF COMPLICATED ASCARIS INFECTION

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Introduction: *Ascaris* infection is a worldwide helminthic infection, though rare in developed countries. It is usually paucisymptomatic, but extra-intestinal complications may occur.
Aims: We describe a case of a complicated *Ascaris* infection in a child from an endemic area.
Methods: Data collected from our patient's hospital file.
Results: An eight-year old healthy female child complained of diffuse abdominal pain for six months. One week before admission, referred progressive right abdominal pain, constipation and vomiting, with no fever or jaundice. She was living in São Tomé e Princípe until four months before. On physical examination an upper right abdominal tenderness was noted. Blood tests showed normocytic normocromic anemia, leucocytes 5.7x10^9/L, eosinophils 15%, C-reactive protein 18,2 mg/L, AST 159 U/L, ALT 154 U/L, gamma-GT 96 U/L, normal levels of bilirubins, serum alkalyne phosphatase and amilase. Abdominal ultrasound observed common bile duct (CBD) wall thickening suggesting cholangitis, biliary sludge and linear hypoechoic tubular structures within the CBD and in the intestinal lumen.
Ascaris lumbricoides ova were observed on stool and for the first five days in the ward, worms were expelled through anus and mouth.
She was treated with albendazole (three days) and, subsequently, with piperazine (two days) with progressive improvement. Household contacts were treated with albendazole.
Conclusions: We intend to illustrate that ascariasis should be suspected in an immigrant child from an endemic area. The migration of larva through the intestinal lumen to the bile ducts, called biliary ascariasis, is rare. Early diagnosis and treatment is important to prevent surgical complications.

ESPID-0919

IRISH SEROGROUP B NEISSERIA MENINGITIDIS PORA GENOTYPE DISTRIBUTION AND AGE ASSOCIATION DURING THE 1997/98 TO 2011/12 EPIDEMIOLOGICAL YEARS

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Background and Aims

The porA protein is a major immunogenic component of the *N. meningitides* cell surface, and is a constituent in several currently licensed non-polysaccharide based vaccines that target serogroup B meningococcal disease. To better inform vaccine candidacy, strategy and hypothetical vaccine coverage we investigated *porA* genotype distributions and their association with age in serogroup B meningococci.

Methods

We determined the *porA* genotypes of 1596 serogroup B *Neisseria meningitidis* isolates from invasive disease, isolated between July 1997 and June 2012.

Results

108 distinct *porA* genotypes were observed. The major genotype distributions were stable over time, with '7-2, 4' consistently the most frequently observed genotype (annual median percentage 36.5%, range 22.2% - 54%). Pentavalent and hexavalent porA protein vaccine formulations could achieve 84.3% and 90% coverage respectively. The '7-2, 4' genotype was significantly less common among isolates from cases age>24 years (p=.042). The '19-1, 15-11' (p=.002) and '19, 13-1' (p=.007) genotypes were significantly more common among 12 to 24 year olds, while the '22, 14' genotype (p=.002) was significantly more common among cases age <1 year.

Conclusions

These results inform vaccine candidacy and strategy by assessing porA diversity and variant stability among invasive meningococcal isolates over 15 epidemiological years in Ireland. The frequency and stability of the '7-2, 4' genotype is encouraging, as the p1.4 peptide is included in the recently licensed four component meningococcal serogroup B vaccine. Significant coverage could also be achieved with six porA types in an outer membrane vesicle preparation.

ESPID-0920

IMPACT OF RAPID INFLUENZA DIAGNOSTIC TEST ON PHYSICIAN ESTIMATION OF VIRAL INFECTION PROBABILITY IN PEDIATRIC EMERGENCY DEPARTMENT DURING EPIDEMIC PERIOD

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Background and aims.

Influenza clinical diagnosis is difficult for infant due to non-specific symptoms. We evaluated the impact of rapid influenza diagnostic test (RIDT) on estimation of influenza clinical probability in children admitted in university emergency department (ED).

Methods

This prospective study included children aged from 1 month to 5 years, admitted in an ED during epidemic period, and who presented a fever without source. The RIDT Quickvue® was performed on nasopharyngeal aspiration and confirmed with immunofluorescence and/or PCR. The clinical probability of influenza and serious bacterial infection (SBI) was evaluated for each child before and after the realization of the RIDT.

Results

170 children were included from January 15th till March 18th 2013. After the clinician examination, the clinical probability of influenza was 66% [IC 95%: 63, 4-68, 4] and was significantly increased 92, 4 % [IC 95%: 89, 5-95, 3] in case of positive RIDT and significantly decreased 30, 8% [IC 95%: 29, 0-32, 5] in case of negative RIDT. Whereas the clinical probability of influenza was appropriate regarding the real prevalence (66% vs 57%), the probability of SBI was overestimated (30% vs. 8, 8%). The RIDT allowed a significant decrease of the prescriptions of chest X-ray (66% vs. 45.8%) and laboratory tests (78.2% vs 41.1%). The medico-economic evaluation suggests a 102-euros potential saving by patient.

Conclusion

The RIDT seems to be a useful diagnostic help in epidemic period for clinicians in ED, and would limit additional prescriptions and global costs in emergency department.

ESPID-0921

WHOLE GENOME SEQUENCING OF DISEASE ASSOCIATED NEISSERIA MENINGITIDIS FROM THE 2010/11 TO 2012/13 EPIDEMIOLOGICAL YEARS IN IRELAND

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Background and Aims

In Europe endemic serogroup B *N. meningitidis* accounts for the majority of meningococcal disease. We sought to define the molecular epidemiology of Irish disease-associated meningococci isolated over three epidemiological years.

Methods

89 *N. meningitidis* disease-associated isolates from the 2009/10 to 2012/13 epidemiological years underwent whole genome sequencing. Whole genome (WG)-MLST NeighbourNet diagrams were constructed from data using both the 53 ribosomal genes and meningococcal core genes using SplitsTree. Draft genomes were stored and queried in the Bacterial Isolate Genome Sequencing Database (BIGSdb).

Results

MLST resolved these 89 isolates, 72 serogroup B (82%), into 16 clonal complexes, with the ST-41/44 and ST-269 complexes accounting for just under 50% of total diversity (34.5% & 14.9% respectively). Whole genome MLST analysis showed the relationships between clonal complexes and the existence of distinct lineages within the ST-269 and ST-41/44 complexes. SgB:7-2,4:F1-5 (ST-41/44 complex), a common epidemiological type in Ireland and elsewhere, displayed great diversity, failing to resolve into a single well defined lineage. Potential coverage of the four component meningococcal Group B vaccine (4CMenB), based on genotypic and predicted immunological cross-reactivity, ranged from 72.6% to 100%.

Conclusions

Improved resolution of WG-MLST schemes (ribosomal/core MLST) shows the relationships between many distinct meningococcal lineages. Identifying and resolving invasive isolates into these lineages is an important advancement in molecular epidemiology, as often lineages have a long term association with distinct antigenic profiles, and sometimes with age or geography, which can inform vaccine design and aid in the control of epidemic spread.

ESPID-0922

DIGITAL ANTIMICROBIAL THERMOMETER FOR AXILLIARY USAGE: A NEW DEVICE FOR MEASURING THE TEMPERATURE OF THE BODY FOR THE REDUCTION OF CROSS-INFECTIONS

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Aim: The aim of this prospective comparative study is to evaluate the reduction of microbial flora on the surface of an axillary digital thermometer, made of antimicrobial copper, in relation with a common digital thermometer.

Material – Methods: A brand new digital electronic thermometer implemented with antimicrobial copper (Cu 70% - Nic 30%, Low Lead) on the two edges of the device (top & bottom: World Patent Number WO2013064847 and Register Number by the Hellenic Copper Development Institute No 11) was manufactured and a comparative study with common digital electronic thermometer was conducted on 9 ICU (Intensive Care Unit.) patients of three different hospitals. The thermometry was performed in accordance with the projected International Nursing Protocols for boby temperature mesaurement. A total of 108 microbiological samples were taken from the axilery area of the patients, using both of the investigated body temperature devises. Simultaneously the “Halo” phenomenon (phenomenon “Stefanis”) was studied at the non antimicrobial copper-implemented parts of the antimicrobial digital electronic thermometer.

Results: In all samples collected from the surface of the antimicrobial electronic digital thermometer, the reduction of microbial flora (Klebsiella spp, Staphylococcus Aureus, Staphylococcus epidermitis, Candida spp, Pneudomonas spp) was progressively reduced to 99% in two hours after the thermometry. The above flora was found in the axillary cavity remained the same in common thermometer. The statistical analysis (SPSS 21) showed a statistically significant reduction of the microbial load ($N = 108, < 0.05$).

Conclusions: The Hospital-Acquired Infections are linked to the transfer of pathogens due to the multi-usage of medical devices from both health professionals and patients, such as axillary thermometers. The use of antimicrobial digital electronic thermometer minimizes microbes' transportation between patients and health professionals while having all the conditions of reliability, proper functioning, security, ease of use and reduced cost.

ESPID-0923

ECTHYMA GANGRENOSUM IN A PREVIOUSLY HEALTHY CHILD

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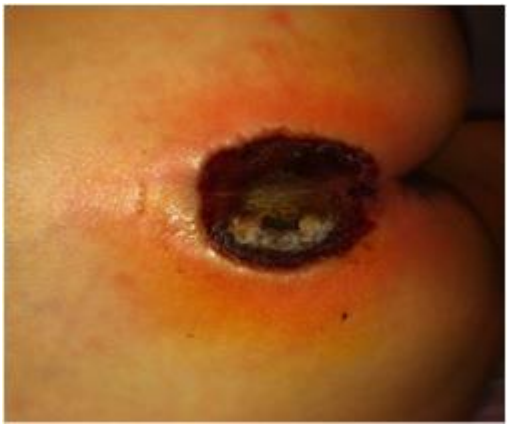
Introduction: Ecthyma gangrenosum is a cutaneous manifestation of invasive infection usually caused by *Pseudomonas aeruginosa* in patients with underlying immunodeficiencies.

Case description: We present a previously healthy 8-month-old girl who developed, four days prior to admission, high fever and a lumbosacral skin lesion. She presented signs of septicemia and a profound ulcerated skin lesion with central necrosis and inflammatory borders, as shown in the picture. Analytically she had neutropenia (900/mm^3), elevated reactive C protein and negative HIV serologies. She started broad-spectrum antibiotherapy. *Pseudomonas aeruginosa* was isolated in blood culture and antibiotherapy adjusted to piperaciline-tazobactam and gentamicine. There was a good evolution and the patient was discharged 15 days later. During the following five months she was readmitted three times for relapse of the sacral lesion, fever with no infectious focus and pneumonia. All the cultures were sterile. She started immunodeficiency investigation with negative antinuclear antibodies, normal count of complement, immunoglobulins and lymphocyte subpopulations. Due to persistent neutropenia (ranging from 300/mm^3 to 900/mm^3) genetic study was requested to exclude congenital neutropenia.

Conclusions:Early recognition of ecthyma gangrenosum allowed appropriate treatment in this case. Despite being healthy these children should be investigated for occult immunodeficiencies.



ESPID-0924

COMPARISON OF INFRARED TYMPANIC THERMOMETER WITH NON-CONTACT INFRARED THERMOMETER

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Background and aims

Non-contact infrared thermometer (NCIT) is a quick, non-invasive and easy to use method to measure body temperature, not requiring sterilization. We aimed to evaluate reliability of NCIT in first assessment of patients in hospital.

Methods

Study was carried out in Hacettepe University Ihsan Dogramaci Children's Hospital between August and September 2013. Study was achieved on patients greater than four months-old that were admitted to infectious disease outpatient clinic or hospitalized. Body temperature of patients was measured with tympanic infrared thermometer (Genius^{TM} 2, Covidien, Mansfield, USA) that is routinely used, and with NCIT (Visiofocus, model 06400,Tecnimed, Vedano, Italy) at the same time. Temperature values, age and disease of patients were recorded.

Results

During the study 220 measurements were acquired from 76 patients. 15 of 220 tympanic measurements were >38 °C and seven of them were also >38 °C with NCIT measurements. The difference between tympanic and NCIT measurements for each readings were calculated. Positive values obtained when tympanic readings are higher than NCIT readings and if tympanic readings are lower, negative values obtained. Mean of difference was –0.5 (±0.3) °C for negative values and 0.6 (±0.4) °C for positive ones.

Conclusions

NCIT can be preferred by parents for screening of fever but before routinely use of it in hospitals more expended studies with NCIT should be performed.

ESPID-0925

PNEUMOCOCCAL ACUTE OTITIS MEDIA IN INFANTS AND YOUNG CHILDREN

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Streptococcus pneumoniae is one of the most common microbial agents involved in the etiology of acute otitis media in infants and young children.

Objectives: The aim of study was to determine the prevalence of pneumococcal infection in children with acute otitis media, identification of risk factors and establishing its sensitivity to antibiotics.

Methods: The authors performed a retrospective study of 115 patients aged between 1 month and 36 months (median age 20 months) diagnosed with acute otitis in their clinic from December 2012 to December 2013.

Results: Out of 220 ??patients with acute otitis media 52 patients (26.3% cases) presented pneumococcal isolated from middle ear fluid samples. Distribution of children by age groups: 0-1 years old (40% of cases) and 1-3 years old (60% of cases). Risk factors associated were nutritional deficiencies (39.13% of cases), immunodeficiency (71.30% of cases), many antibiotics previously used (43.47% of cases), collectivities (52.17% of cases), absence of pneumococcal vaccination (86.95% of cases). Clinical forms of acute otitis media encountered in study group were: acute suppurative otitis media – 47.82%, and acute pre-suppurative otitis media –51.18% of cases. Antibiotic sensitivity of Streptococcus pneumoniae was 72.86% to Rifampicin, 48.69% to Clindamycin, 80.86% to Ciprofloxacin, 86.95% to Chloramphenicol and only 17.39% to Penicillin.

Conclusions: etiological treatment of pneumococcal infections in infants and young children raised issues regarding multi-resistant to antibiotics as well as age-related limitations of their administration. It is necessary to introduce anti-pneumococcal vaccination in the Romanian Immunisation Program.

ESPID-0926

PREVALENCE OF PERTUSSIS IN PATIENTS WITH PROGRESSIVE COUGH

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Background and aim: Persistent cough is a common problem to visit a doctor, but its etiology is difficult define based solely on the character of cough. What are the clinical characteristics of pertussis in highly immunised population is still unclear. We aimed to determine the prevalence and clinical characteristics of pertussis and parapertussis among patients with cough lasting more than 7 days.

Methods: Patients with progressive cough of unknown etiology persisting over 7 days were enrolled into prospective study from 23.04.2012 to 31.12.2013 from 16 GP practices and 2 paediatric hospitals. Pertussis was confirmed by culture and/or PCR and/or by presence of pertussis toxin (PT)-IgG antibodies >100IU/mL or PT-IgG 40-100 IU/mL and PT-IgA≥12 IU/mL. Parapertussis was confirmed by culture and PCR.

Results: Of 290 patients recruited 19 (6.6%) had pertussis (children 10.3%, adults 5.2%) and 5 (1.7%) parapertussis (children 5.1%, adults 1.7%). Compared to patients with cough of unknown etiology those with pertussis had significantly more often inspiratory whoop and posttussive emesis (Table 1).

Table 1: Clinical characteristics of patients and significance of symptoms for predicting confirmed pertussis/parapertussis.

				Pertussis vs unknown etiology		Parapertusis vs unknown etiology		Pertussis vs parapertussis	
Characteristic	Pertussis	Parapertussis	Unknown etiology	RR +95%CI	*p*	RR +95%CI	*p*	RR +95%CI	*p*
Median (IQR)									
Age (years)	21.4 (8.2-39.4)	7.7 (5.7-12.4)	36.0 (19.7-52.3)	N/A	0.01	N/A	0.04	N/A	0.3
Number of paroxysm in 24h	7.0 (3.0-13.0)	12.5 (10.0-17.5)	10.0 (5.0-15.0)	N/A	0.4	N/A	0.2	N/A	0.1
Prevalence % (95%CI)									
Paroxysm	84.2 (60.4-96.4)	80.0 (28.8-96.7)	89.9 (85.4.-92.8)	0.9 (0.8-1.2)	0.6	0.9 (0.6-1.4)	0.6	1.1 (0.7-1.7)	0.8
Cough without paroxysm	47.4 (24.5-71.1)	60.0 (15.4-93.5)	72.2 (66.8-77.6)	0.7 (0.4-1.1)	0.09	0.8 (0.4.1.7)	0.6	0.8 (0.3-1.9)	0.6
Inspiratory whoop	57.9 (33.5-68.6)	40.0 (6.5-84.6)	37.2 (31.4.-43.0)	1.6 (1.0-2.4)	0.04	1.1 (0.4-3.2)	0.9	1.4 (0.5-4.5)	0.5
Posttussive emesis	68.4 (43.5-87.4)	20.0 (3.3-71.2)	23.3 (18.2-28.4)	2.9(2.0-4.3)	<0.0001	0.9 (0.1-5.0)	0.9	3.4 (0.5-20.3)	0.2
Apnoea	26.3 (9.3-51.2)	0.0 (0.0-52.1)	19.9 (15.1.-24.7)	1.2 (0.6-2.9)	0.5	0.4 (0.0-6.0)	0.5	3.3 (0.2-51.5)	0.4
Fever (>37,3˚C)	31.6 (12.7-56.5)	40.0 (6.5-84.6)	42.5 (36.5-48.4)	0.7 (0.4-1.5)	0.4	0.9 (0.3-2.8)	0.9	0.8 (0.2-2.8)	0.7

IQR - interquartile range
RR - relative risk
N/A – not available

Conclusion: Despite high immunisation rates in Estonia *B. pertussis* still remains a potential reason for prolonged cough. Clinical differentiation of pertussis and parapertussis from other causes of progressive cough is complicated but presence of inspiratory whoop and posttussive emesis could suggest pertussis.

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SURVEILLANCE FOR INFLUENZA AND RHINOVIRUS INFECTIONS IN HONG KONG PRESCHOOL CHILDREN

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Introduction: Influenza and human rhinovirus (HRV) infections are significant health burden in young children. However, limited data on any interaction between influenza and HRV exists.

Objective: To characterise incidence of influenza and HRV Infections among Hong Kong preschool children.

Methods: This prospective study recruited 5-year-old children from three randomly selected kindergartens. Their parents completed a questionnaire on health status and influenza vaccination. Nasopharyngeal flocked swabs (NPFSs) were collected by: (i) 2-weekly surveillance school visits during one influenza season between February and March 2012, and (ii) illness visits for children with respiratory infections. Influenza and HRV were detected by multiplex polymerase chain reactions.

Results: Forty-nine of 54 consented children gave at least one NPFS, and 44 (89.8%) of them provided four surveillance NPS samples. Thirteen samples from 12 (24.5%) children were influenza-positive, including 10 (20.4%) of 49 children by surveillance and 3 of 10 sick children. Only two (16.7%) children were vaccinated within 12 months. Influenza was not associated with any environmental or vaccine-related factors. Twenty-nine (59.2%) children had HRV infection, yielding 18 for each of HRV-A and HRV-C. Five children had HRV-A and HRV-C on different surveillance samples. None of HRV-infected children had influenza co-infection. Three sick children were positive for HRV-C.

Conclusions: Most preschool children infected with influenza or HRV had minimal respiratory symptoms. Low vaccine uptake is a possible cause of influenza in these young children. Our results do not support a substantial co-infection between influenza and HRV in preschoolers.

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ESPID-0928

PEDIATRIC GONOCOCCAL CONJUNTIVITIS: ALTERNATIVE WAYS OF TRANSMISSION

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BACKGROUND AND AIMS Gonococcal conjunctivitis (GC) is a highly contagious eye infection caused by *Neisseria gonorrhoeae*. Childhood infection occurs mainly in newborns (vertical transmission) and children/adolescents (non-intimate interpersonal contact, contact with infected fomites and sexual contact/abuse). This study aims to determine the epidemiology of GC in pediatric units of a European country, calling attention to less known modes of transmission.

METHODS Descriptive study of children admitted with GC in two pediatric units in a 12-year period. Clinical charts and exudate bacterial cultures were consulted. Clinics, age, parents' origin, source and mode of transmission were evaluated.

RESULTS Seven reports were assessed; 3 newborns; 3 children between 12 and 24 months and a child aged 8; 6/7 had African origin. The clinical diagnoses were conjunctivitis (3) and orbital cellulitis (4). All were transmitted by a close relative (mother-57%). Regarding mode of transmission, 3 had vertical transmission, 1 was through infected fomites, 1 through non-intimate interpersonal contact and in 2 through eye urine irrigation as an ethnic traditional purpose. No cases of sexual transmission were found. All children were treated with parenteral ceftriaxone with no sequelae.

CONCLUSIONS GC can occur in young children. Unlike gonococcal infection at other location, a non-sexual mode of transmission can occur. Still, signs of sexual abuse should always be excluded. Also, prevention of alternative modes of transmission should be emphasized. These occur mainly among African immigrants who live in crowded habitations with poor hygiene conditions or may have ethnic traditional practices (eye urine irrigation).

ESPID-0929

INCIDENCE STUDY ON CENTRAL LINE ASSOCIATED BLOODSTREAM INFECTIONS (CLABSI) AND ON VENTILATOR ASSOCIATED PNEUMONIA (VAP)

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BACKGROUND AND AIMS

Central line-associated bloodstream infections (CLABSI) and ventilator-associated pneumonia (VAP) represent a major challenge in the management of pediatric patients. The aim of the present study was to evaluate the incidence of CLABSI in 2012 and 2013 and of VAP in 2013 in a tertiary-care pediatric hospital.

METHODS

A prospective incidence study has been carried out in all inpatient wards at the Anna Meyer Children's University Hospital during April 2012 and March and April 2013. Updated CDC definitions for CLABSI and VAP were applied. A survey study group was instituted, a form was prepared and health-care workers were trained to collect any CLABSI or VAP episodes in different wards.

RESULTS

The survey collected data about CLABSI on 97 children and 935 catheter days in 2012 and 122 children and 1123 catheter days in 2013. In the 2013 survey, data about VAP on 26 children and 166 ventilation days were also recorded.

CLABSI rate was 3.21 (95%CL:1.03-9.95) per 1,000 catheter days in 2012 and 1.78 (95%CL: 0.45-7.12) in 2013 (Table 1).

VAP rate was 6.02/1000 days of mechanical ventilation (95%CL 0.85-42.77), with 1 event on 166 days of follow up. The rate in newborn patients was 6.99 (95%CL 0.99-49.64).

CONCLUSIONS

Our study showed results similar to those reported internationally. However, in NICU and Onco-hematology, where CLABSI survey and rigorous programs on CVC

management were implemented since 2011, the incidence of CLABSI was very low.

		CLABSI rate/ 1000 catheter days (95% CL)	
		2012	2013
Admission Ward	Internistic Pediatric	0.00	4.07 (0.57-28.86)
	PICU	15.50 (3.88-61.99)	5.26 (0.74-37.36)
	NICU	0.00	0.00
	Surgery	7.63 (1.07-54.19)	0.00
	Onco-Hemathology	0.00	0.00
	Others		0.00
Age	Newborn	3.66 (0.92-14.65)	1.78 (0.25-12.52)
	Paediatric	5.76 (2.41-13.92)	1.80 (0.25-12.77)
Total cohort		3.21 (1.03-9.95)	1.78 (0.45-7.12)

ESPID-0930

PREDICTING LYME DISEASE IN CHILDREN WITH FACIAL PALSY IN A CENTRAL EUROPEAN LYME ENDEMIC REGION

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Background:

The clinical manifestation of borrelia infection varies considereably, depending both on underlying borrelia species and host factors. In Central European children, lyme disease is the major cause of sudden onset facial palsy, while in Northern America lyme disease mainly presents as arthritis, less often as menigitis and rarely as isolated facial palsy.

Therefore, previous studies that described risk factors to predicit lyme disease in children with facial palsy in the US or in Scandinavia do not necessarily reflect the situation in a Central European region.

Objective:

Our aim was to describe the clinical and laboratory findings in children with sudden onset facial palsy in order to predict lyme disease, defined as pleocytosis and borrelia specific CSF antibodies in Southern Germany.

Methods:
We performed a retrospective data analysis of children aged 2 to 18 years that presented to our hospital with acute onset facial palsy during a 10 years period from January 2004 to December 2013. We reviewed medical charts for host and environmental factors like age, season, history of erythrema migrans, duration or neurological symptoms as well as laboratory and serological findings. We assessed these parameters for independent association with lyme disease.

Results and Conclusion:

A combination of clinical parameters and serologic findings has a high negative predictive value for lyme disease in children presenting with acute onset facial palsy in Southern Germany.

ESPID-0931

PAEDIATRIC ANTIMICROBIAL STEWARDSHIP PROGRAMME (PASP) EXPERIENCE IN AN NHS HOSPITAL

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Background

About 30-50% of hospitalized patients are on antimicrobials, however they are frequently used inappropriately as shown by antimicrobial stewardship programmes. We aim to describe the initial phase of a paediatric antibiotic stewardship programme (PASP) in a UK NHS hospital.

Methods

Between 19 November - 19 December 2013 an antibiotic stewardship programme was implemented in a 52 bedded paediatric department in St George's hospital, London. Children in intensive care were excluded. A team of paediatric infectious diseases doctors (middle grade/consultants) reviewed each prescription chart three times/week, identified all children on intravenous antimicrobials for more than 48 hours and suggested antimicrobials changes in line with the local guidelines. The data collected included: type, dose, route, start and stop date of the antimicrobials, the specialty, organisms, resistance and the advice given.

Results

There were 159 prescriptions for intravenous antibiotics in 110 children. The median age was 3 years (IQR 0-7), 55% were males and 44% had an underlying condition (e.g. hemato/oncology, chronic neurological problems and chronic lung disease). The antimicrobial stewardship team took 2-3 hours to review an average of 47 charts per session. Of the 19 antimicrobials used, co-amoxiclav (23%) and ceftriaxone (15%) were the most frequently prescribed. The PASP team suggested changing 58/159 (36%) prescriptions.

Conclusions

PASP is feasible but requires between 36 to 42 hours per month doctor-time for its implementation. The PASP team suggested a high number of prescription changes highlighting the importance of the programme in optimizing antimicrobial use.

ESPID-0932

THE PREVALENCE OF INFECTIOUS DISEASES AMONG CHILDREN INTERNATIONALLY ADOPTED TO DENMARK

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Background: International adopted children (IAC) are at increased risk of infectious diseases. Studies from the 1990´th have shown that 60 % of all IAC had an infectious disease, and that 80% of the infectious diseases and other medical problems in IAC were revealed by screening. The aim of this study is to calculate prevalence's of infectious diseases among IAC´s.

Methods: In 2009 a clinic was established at at Rigshospitalet. The purpose was to offer all IAC´s to be examined by a paediatrician after arrival to Denmark. The children have had a thorough examination and have been tested for HIV, hepatitis A, B and C, syphilis and tuberculosis, and they have collected stool samples for parasites. The calculations are based on information from children seen in the clinic.

Results: Parasites were found in 46(43,4 %) of the stool samples. 3 (1, 8 %) were infected with hepatitis A virus, 6 (2,6%) children had chronic infection with hepatitis B, and one (0,6%) was infected with hepatitis C. There were one (0,7%) child infected with syphilis and no HIV positive. Five (5,5%) children had latent tuberculosis.

Conclusions: IAC´s are at higher risk of infectious diseases than children born and raised in Denmark. We recommend that they are examined by paediatricians, shortly after arrival. The examination should include a physical examination and blood samples, as well as examination of the stool. This would enable the quick treatment of infectious diseases, thereby reducing the possible impact on the family and other close contacts.

ESPID-0934

GROWTH AND HAEMATOLOGICAL SIDE-EFFECTS IN INFANTS EXPOSED TO ANTIRETROVIRALS BORN TO HIV INFECTED WOMEN

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Background

Mother-to-child HIV transmission (MTCT) is currently <1% in western countries, due to prevention measures, which includes antirretroviral treatment exposure during pregnancy and neonatal prophylaxis.

Methods

We analyse the anthropometric data and the prevalence of haematological adverse events (AE), according to DAIDS AE Grading Table, in all newborns from HIV-infected mothers (NB-HIV) in our hospital, during 2000-2012.

Result

208 NB-HIV were attended (2000-12). Prematurity (<37 weeks) was observed in 22% newborns (7.2% <35 weeks). Prematurity was not related neither to maternal highly active antiretroviral treatment (HAART) or to use of protease inhibitors (PI). Nevertheless, it was associated to detectable maternal HIV-viral load (VL+) (p=0.036) and a high risk of MTCT (p=0.045). 23.6% were small for gestational age (SGA) and no relation was found with HAART or PI exposure, but it did to VL+ (p=0.036) and more risk of MTCT (p=0.048).

In relation to haematological AE under neonatal prophylaxis, 47.6% showed no AE, 22.1% anaemia, 15,9% neutropenia, high lactate level 1,4% and thrombocytopenia 0,5% (17,7% was not documented). Comparing the use of one versus three antiretrovirals (due to the risk of MTCT), we found that only anaemia was related with the use of three antiretrovirals (p=0.028, Phi 0.185).

Conclusions

There was no association between HAART or use of PI and gestational age and weight of NB-HIV, while maternal viral load and risk of MTCT do. Anaemia in NB-HIV was more associated with use of neonatal prophylaxis with three antiretrovirals, so it should be controlled more closely in these cases.

ESPID-0935

MENINGOCOCCAL INFECTIONS:EPIDEMIOLOGY AND OUTCOMES

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INTRODUCTION: the invasive meningococcal infection may results in meningococcemia, meningitis, or both. Onset often is abrupt, and represents generally a severe disease. Sings and symptoms of meningococcal meningitis are indistinguishable from other acute meningitis. The aim of this study was to know epidemiology and outcomes of meningococcal infections among pediatric patients admitted in Pequeno Principe Hospital (PPH) a pediatric quaternary hospital in south of Brazil.

METHODS: Between 2007 and 2013 all meningococcal infections cases were investigated by the Epidemiology and Infection Control Department (EICD). Diagnostic test used were culture of blood and cerebrospinal fluid. Diagnostic criteria to confirm meningococcal infections were lab test and /or clinical- epidemiologic data. We analyzed age-year and outcomes.

RESULTS: In this 7 years of surveillance, 305 bacterial meningitis were investigated, 76 (24.91%) were meningococcal infections: 17(22.36%) meningitis, 19(25%) meningococcemia and 40 (52.63%) were meningitis with meningococcemia. The prevalent age group was under 1 year age (23; 30.26%), and 10 (13.15%) deaths occurred in the study period. The serogroups were identified in n=37/76cases (48.68%): serogroup B (n=21; 56.75%),serogroup C (n=13;35.13%),serogroup Y (n=2;5.40%) and serogroup W-135 (n=1;2.7%).

CONCLUSIONS: the incidence of meningococcal diseases varies over time, location and by age and the distribution of meningococcal serogroups may varies too.Despite the limitation of identification, our study shows a prevalence of serogroup B and circulation of new serogroups in our area.

ESPID-0936

EPIDEMIOLOGY OF FUNGEMIAS IN A TERTIARY PEDIATRIC HOSPITAL DURING A 6-YEARS PERIOD

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Background: Fungemia is an important cause of morbidity, increased hospitalization and healthcare costs in critically ill or immunocompromised children.

Aims: The purpose of this study was to record changes in epidemiology of fungemia in the pediatric population of a tertiary pediatric hospital over a 6-year period.

Methods: Medical records of children diagnosed with fungemia at 'Aghia Sophia' Children's Hospital, from January 2007 to December 2012, were retrospectively analyzed. Identification of isolates was done conventionally and by PCR-sequencing. MICs were measured using gradient MIC method (Liofilchem, MIC Test Strips).

Results: Fungemia was diagnosed in 131 patients 0-14 years of age. Neonates comprised 52.7% of the total episodes; PICU 13.7%, oncology patients 13.7%, patients from BMT unit 5.3% while the rest belonged to pediatric and surgical departments. Fungemia episodes were statistically significant increased (p=0.013) over time in all hospital departments. Candida albicans spp was isolated in 61 children (49.6%). An increasing frequency of non-Candida spp was noted over time although no statistical importance was detected. C. albicans strains were 97.5% sensitive to amphotericin and 100% to fluconazole, caspofungin and voriconazole. C. parapsilosis strains were 95.8% sensitive to amphotericin, 92.1% to fluconazole, 94.7% to caspofungin and 100% to voriconazole. C. glabrata strains were 100% sensitive to amphotericin, caspofungin and voriconazole, 50% Susceptible Dose Depended (SDD) to fluconazole and 100% resistant to itraconazole.

Conclusions: In our study population the frequency of fungemia increased during the study period. Candida albicans strains remained sensitive but Non-candida spp were detected with increasing frequency.

ESPID-0937

CONGENITAL RUBELLA - RARE PATHOLOGY, BUT STILL PRESENT -CASE REPORT

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Introduction

Congenital rubella is a rare disease (less than one case per million births in the U.S.). The maternal infection transmitted to the fetus through the placenta has various consequences: embryo resorption, miscarriage, fetus-placental infection.

Objective

The aim of this paper is to present a case of congenital rubella infection, which was diagnosed postnatally.

Method

The newborn was a third pregnancy, the third term delivery with appropriate development, without laboratory investigations for infections TORCH. The cranial presentation delivery took place spontaneously, with Apgar score 6/8. Immediately after birth a mild form of respiratory distress occurred.

The clinical and laboratory data raised suspicion of congenital pneumonia. The evolution was unfavorable under the initiated treatment. The functional respiratory syndrome worsened and bradycardia and hypertension occurred. The heart ultrasound revealed multiple malformations: atrial septal defect, large subaortic ventricular septal defect, pulmonary atresia. The specific serology revealed a significantly increased titre of specific antirubella antibodies . The transfontanelar ultrasound did not show any changes and the ophthalmolgic and ENT examinations were not performed. The evolution was unfavorable leading to death on day 10 of life.

In the case presented there was no positive anamnesis and no laboratory evidence suggestive of congenital rubella infection in the mother was present.The clinical, laboratory and the pathological examinations (performed after death) revealed no other abnormalities suggestive of congenital rubella.

Conclusions

Congenital rubella, which is an extremely rare disease, can occur even if the mother does not identify the clinical symptoms suggestive of a rubella infection during the pregnancy.

ESPID-0938

LOCK-THERAPY WITH ETHANOL FOR THE SALVAGE OF COLONIZED LONG-TERM CENTRAL VENOUS CATHETER: EXPERIENCE IN ONCOHEMATOLOGICAL PEDIATRIC PATIENTS

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Introduction. Recent guidelines contemplate the possibility of salvage infected long-term CVC combining systemic antibiotics and lock-therapy. Ethanol seems effective in sterilizing bacteria and biofilms.**Aims.** We compared the efficacy of 70% ethanol vs. antibiotic lock to treat tunneled catheter-associated blood stream infections (CABSI). **Methods.** Adult and pediatric patients with CABSI were randomized in a single-blind trial to receive either 70% ethanol or antibiotic lock. Inclusion criteria: diagnosis of CABSI, positive blood cultures drawn from the CVC (a single isolation for pathogens, two isolations for skin contaminants), need for device salvage. Primary endpoint: number of retained devices at 7 days. **Results.** Among all the patients enrolled, 26 neutropenic oncologic children have been screened; age 3-18 years. 13 (11 Broviac, 1 Port, 1 Groshong) fulfilled inclusion criteria, 9 randomized in ethanol group, 4 in antibiotic group. Blood cultures were positive for gram negative in 10/13 patients (1 *K. pneumoniae ESBL*,1 *K. Pneumoniae*, 1 *KPC*, 1 *E. coli ESBL*,1 *Ps. aeruginosa*, 3 *E. coli*, 1 *Chryseobacterium indologenes*, 1 *E. faecalis*, 2 *S. epidermidis MR, 1 S. aureus*). Medium lock-time was 12 hours (range 8-24h). Device was removed in 5 cases: 2 for elective treatment discontinuation (both in ethanol group but with negative culture of the tip), 3 for persistent fever. No side effects were reported in ethanol group, none device occlusion. **Conclusion.** 70% ethanol-lock was effective in sterilizing CVC in the patients treated, even if colonized by MDR pathogens. The technique is safe, easy to use and valuable in patients under multidrug systemic therapy.

ESPID-0939

ATTITUDES AND AWARENESS OF HEALTH CARE PROVIDERS TO HIV POSITIVE MOTHERS AND INFANTS

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Introduction

With the advance of highly active anti-retroviral therapy, neonatal and subsequently paediatric HIV is a rare occurrence in Ireland. HIV positive mothers can expect, with 98% certainty, that their infants will be born virus free. Despite this, these mothers and infants are among some of the most stigmatised and alienated individuals in our healthcare system.

Aims/Objective

To assess the knowledge base and attitudes towards the care of HIV positive women and children on neonatal and maternity wards in our hospital; on average 3,500 deliveries per annum.

Methods

We anonymously surveyed nursing and medical staff within the Women and Children's directorate, University Hospital Galway. A questionnaire comprising of 10 questions; 2 demographics, 2 attitude related and 6 knowledge based questions was used.

Results

70 completed questionnaires were analysed (52 nursing staff, 18 medical staff). Knowledge of routes of transmission, high-risk fluids, required precautions and life expectancy were low. There was a significant difference ($p=0.04$) between level of comfort of students and qualified nursing and midwifery staff. The issue of disclosure of HIV status to hospital staff was also addressed with 58% opting for disclosure to all staff, 42% indicated only staff directly involved in care should be informed.

Conclusions

There is a large deficit in both the background knowledge and the practical care of HIV positive mothers and their infants. Following on from the results of the survey a fact sheet addressing the issues raised by the survey was compiled and distributed to the relevant clinical areas.

ESPID-0940

ARTHRITIS IN KAWASAKI DISEASE: A POORLY RECOGNIZED MANIFESTATION

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BACKGROUND AND AIMS Kawasaki disease (KD) is an idiopathic acute systemic vasculitis of young children. Arthritis is still being a common manifestation not always evaluated. Aim: determination of arthritis prevalence in KD and definition of its pattern and clinical course.

METHODS Descriptive study of children admitted with KD and arthritis during a 15-year period. Clinics, laboratory, treatment response and coronary involvement were evaluated.

RESULTS 63 patients with KD were identified, 60.3% male. The prevalence of arthritis was 12.7% (8/63); in these patients the median-age (3.0 versus 1.8; p=0.025) and the criteria for complete KD (75% versus 67%) were higher than non-arthritic KD patients. 62.5% had oligoarthritis (≤4 joints) all with large joint involvement and 37.5% polyarthritis (large and small joints). Early presentation arthritis was observed in 75% (5/8). In arthritic patients days of fever to treatment was superior (median 7.0 versus 6.5), C-reactive protein was higher (mean 127.72mg/L versus 109.36mg/L), cardiac involvement was present in 37.5%(3/8) versus 30.9% (17/55) and response to initial IVIG was lower (62.5% versus 85.4%). Arthritis duration reached 12.71 days (SD=6.55). All recovered with no joint sequelae.

CONCLUSIONS This study shows the importance of a systematic evaluation of articular involvement in KD. It's a short-lived phenomenon, predominantly with early presentation and involving larger joints. Patients are older and showed a tendency for less response to initial IVIG. Its expression can be sufficiently relevant to lead clinicians to alternative diagnoses and delay of KD therapeutics.

ESPID-0941

SECOND ATTACK OF THE POSTSTREPTOCOCCAL GLOMERULONEPHRITIS (PRESENTATION OF A PARTICULAR CASE)

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Introduction: Acute Poststreptococcal Glomerulonephritis (APSGN) is the most common glomerulopathy in our country. It's necessary that disease is diagnosed in its early stage, so it can be treated adequately, which would result in successful outcome. The second attack of APSGN is rare disease.

Goal: Presentation of a case with second attack of APSGN

Materials and methods of work: Laboratory, immunological and clinical evaluation and estimation of the disease, ASTO, C 3 and their controlling and monitoring during the 2 attacks of APSGN.

Results: The following is the clinical manifestation of child at age of 4,5: the beginning of the disease is characterised with nephritic sympthoms, macroscopic hematuria, swellings, hypertension 140/90 mmHg and oliguria. The laboratory examinations show increased ASTO 970 and decreased C3 which is lower than 0.25 gram/litre. After 5 weeks, disease improved with retreating of the nephritic syndrome and normalizing C3. After 4 weeks, girl's urinary finding was normal as well. After 24 months of the first attack, a streptococcal angine was contracted, which was treated with oral penicillin in course of 10 days. The control urine shows microscopic hematuria. Again there was a decline in the complement (C3 < 0,35 g/l) and an increase in antistreptolysin titar (550 u/l), which indicates to subclinical form of the disease. At the end,was noticed entire retreatment of abnormalities of C3 and ASTO which resulted in curing the disease.

Conclusion: Detection,right treatment of the patients with acute nephritic syndrome, and clear distinction from the other hypocomplementary nephrite are of great importance.

ESPID-0942

EPIDEMIOLOGY OF SEVERE RESPIRATORY SYNCYTIAL VIRUS INFECTIONS IN HONG KONG CHILDREN

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Introduction: Respiratory syncytial virus (RSV) is a common cause of lower respiratory tract infection in young children. However, there is limited data on severe RSV infection requiring pediatric intensive care unit (PICU) admissions.

Objective: To describe features of RSV-associated PICU admissions in Hong Kong and investigated factors for mortality and duration of PICU stay.

Methods: Children with laboratory-confirmed RSV infection and admitted to PICUs of all eight government hospitals in Hong Kong between January 2009 and June 2011 were identified. RSV in respiratory samples was detected by direct immunofluorescence and/or viral culture. The relationship between mortality and PICU duration and demographic and clinical factors were analyzed.

Results: 118 (2.4%) PICU admissions were identified among 4912 RSV-positive pediatric cases in all hospitals. Sixty-five (55.6%) patients were infants. PICU admissions were higher between October and March. Eight (6.8%) patients died, but only two were infants. RSV-associated mortality was associated with prior sick contact, presence of older siblings, neurodevelopmental conditions, chromosomal and genetic diseases and bacterial co-infections, but none was significant following logistic regression analyses. Chronic lung disease was the only risk factor for the duration of PICU admission (beta=0.218, p=0.017).

Conclusions: The majority of RSV-infected children do not require PICU support. There is winter seasonality for RSV-associated PICU admission in Hong Kong. Prior sick contact is the only risk factor for RSV-associated mortality whereas presence of chronic lung disease is associated with longer PICU stay. The current risk-based approach of RSV prophylaxis may not be effective in reducing severe RSV infections.

ESPID-0943

RELIABILITY OF RADIOLOGICAL DIAGNOSIS IN CHILDREN AND ADOLESCENTS WITH CONFIRMED TUBERCULOSIS INFECTION

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Latent tuberculosis infection (LTBI) and active tuberculosis in children and adolescents is usually differentiated by radiological features as clinical symptoms are often missing or nonspecific. While in LTBI the chest x-ray is normal, there are multiple radiological signs in active tuberculosis with none of these being pathognomonic. Since the treatment of both manifestations differs in length and intensity, a correct diagnosis is crucial.

We compared the radiological diagnoses of different medical specialists with varying degrees of work experience in children with confirmed tuberculosis infection.

Three paediatric radiologists, three radiologists and three paediatric pneumologists evaluated independently 120 chest x-rays of children (0-17 years) with confirmed tuberculosis infection. In addition to this, three experienced paediatric radiologists established a diagnostic 'gold standard'. The individual results of the nine examiners were compared to the 'gold standard'.

In comparison to the gold standard:

- The diagnosis 'tuberculosis' was more frequent in primary health care physicians (45 vs. 27,5%)
- Paediatric radiologists showed the best sensitivity (77%) and specificity (95%)
- Radiologists had a low sensitivity (68%), but very high specificity (95%)
- All specialist groups were very inconsistent in their diagnoses
- Level of work experience correlated well with the diagnostic quality

Chest x-rays are neither a very sensitive nor specific tool to differentiate between LTBI and active tuberculosis. Paediatric radiologists showed the best diagnostic quality. Therefore, experienced paediatric radiologists should be in charge in children with suspected tuberculosis.

ESPID-0944

EPIDEMIOLOGY OF COMMUNITY-ONSET EXTENDED SPECTRUM BETA-LACTAMASE-PRODUCING ENTEROBACTERIACEAE INVASIVE INFECTIONS IN CHILDREN IN A FRENCH TEACHING HOSPITAL

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Backgrounds and aims. The spread of extended spectrum beta-lactamase (ESBL)-producing *Enterobacteriaceae* (ESBL-PE) in the community may affect empiric antibiotic therapy and outcome of patients. Limited data is available about ESBL-PE infections in children. We aimed to report the epidemiology of community-onset ESBL-PE invasive infections in our hospital.

Methods. Data of all children younger than 16 years admitted from 2007 to 2012 in a French pediatric tertiary hospital, with a positive sample for ESBL-PE from usually sterile sites within the 48 hours after admission were retrospectively collected and analyzed with a special focus on healthcare-associated infections.

Results. Among the 3612 *Enterobacteriaceae* isolates from usually sterile sites, the prevalence of ESBL-PE was 3.9%, and increased over the study period from 2.4 to 5.1% ($p<0.001$). Among the 90 patients with a first ESBL-PE infection, 58% had a healthcare-associated infection, 87% of strains were susceptible to amikacin, and 87% had a favorable outcome despite inappropriate initial empiric treatment. Compared with patients with community-associated infections, patients with healthcare-associated infection had less frequently pyelonephritis (86% vs 97%) and *E. coli* infections (35% vs 84%), and more frequently *K.pneumoniae* ones (46% vs 8%). Among patients with community-associated infections, 85% and 58% had one or more risk factors for ESBL-PE infections previously identified in the literature, respectively.

Conclusion. In our hospital, community-onset ESBL-PE infections are increasing, and mainly occur in patients with healthcare-associated criteria or risk factors, and most often strains are susceptible to amikacin.

ESPID-0945

INVASIVE PNEUMOCOCCAL DISEASE IN ROMANIAN CHILDREN UNDER 5-YEARS OF AGE: TWO CASE REPORTS

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Background and aims: Invasive Pneumococcal Disease (IPD) is a leading cause of morbidity and mortality among children under 5 years of age, with a mean incidence in Europe of 39/100.000. After implementation of pneumococcal vaccination with heptavalent pneumococcal conjugate vaccine common serotypes involved in IPD are 1, 19A, 3, 6A, 7F.

Methods& Results: In this article we present the cases of two imunocompetent children, aged 3 and 4 years, previously not vaccinated antipneumococcal, admitted to the National Institute of Infectious Diseases “Prof Dr Matei Bals” during November - December 2013 with Invasive Pneumococcal Disease.

The first patient presented with a toxic appearance after a 3-day history of a respiratory illness. Chest radiography showed a parapneumonic pleural empyema and laboratory work-up detected a blood culture and pleural fluid culture positive for pneumococcus serotype 3.

The second patient had previous nasal colonization with a nontypeable Streptococcus pneumoniae and presented with a 3-week history of illness which started as a purulent tonsillitis and acute otitis media. The clinical response under sustained antibiotic treatment with betalactams and aminoglycosides was unfavorable and he developed a retropharyngeal abscess which needed an urgent surgical intervention.

Conclusion: This article presents two severe cases of invasive pneumococcal disease in imunocompetent children who required urgent medical and surgical treatment with increased economical burden, highlighting at the same time the role of pneumococcal immunization in preventing serious infections with Streptococcus pneumoniae.

ESPID-0946

CENTRAL LINE BUNDLE IMPLEMENTATION IN GREEK CHILDRENS HOSPITALS AND IMPACT ON CENTRAL LINE ASSOCIATED BLOODSTREAM INFECTIONS

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Type of Location	Patient Days	Central Line-Days	Central Line Utilization Ratio	CLABSI Rates
Bone Marrow Transplant Unit	3,081	2,988	0.9	2.5
Hematology/Oncology Units	13,667	9,867	0.7	1.4
PICUs	3,122	1,620	0.5	12.3
NICUs	14,021	3,240	0.2	3.6

Central line associated bloodstream infection (CLABSI) is the most common healthcare-associated infection in children and is associated with significant morbidity, mortality and costs. To prevent these infections, bundled interventions are recommended. Our aim was to determine the impact of central line (CL) bundle implementation on CLABSI rates in children's hospitals in Greece**.**

We conducted active surveillance for CLABSIs in pediatric and neonatal intensive care units (ICUs), oncology and transplant unit at 2 affiliated children's hospitals in Athens between October 2012 and September 2013 using the CDC definitions. Unit-specific rates of CLABSI 6 months before and 6 months after implementation of a multifaceted bundle **included hand hygiene, chlorhexidine skin antisepsis, maximal barrier precautions, dressing care, and use of an insertion checklist. We detected 55 CLABSIs and 17,715 CL days in both hospitals. Total CLABSI rates decreased from 5.9 per 1000 CL days in the baseline to 2.8 per 1000 CL days during the post-intervention period (p=0.001). Unit-specific CLABSI rates ranged from 12.3/1000 CL days in the PICUs to 1.4/1000 CL days in Oncology Units. (Table 1) The greatest improvement in CLABSI rates was observed in PICUs.**

Associated with implementation of CL bundles that focused on insertion and maintenance of CL, the total CLASBI rate showed a statistically significant decline. This program highlights the impact on CLABSI rates that can be achieved in the first year of a CLABSI prevention program

ESPID-0947

BACTERIAL MENINGITIS IN MOROCCO BETWEEN 2009 AND 2012

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Bacterial meningitis (BM) in children is a public health problem in Morocco as it's responsible of major sequelae and significant mortality.

The objective of the study is to describe the clinical bacteriological and evolving profile of BM; especially after having introduced anti- Hib and pneumococcal vaccines (PCV) in the national immunization program respectively in 2007 and 2010.

This is a retrospective study of 245 cases of BM diagnosed in children's hospital of Casablanca between January 2009 and December 2012.

Our patients are aged from 1 month to 14 years. 73% are younger than 5 years. The causative agent was identified in 49.8 % of cases. ***Neisseria meningitidis (NM)*** type B represented 63.9 % of identified cases, followed by ***Streptococcus pneumonia (SP) in*** 19.6 %, Gram-negative bacilli in 7.3 % and ***Haemophilus influenza (*** HIb) in 4.9%. The sensitivity was tested in 17 case of ***SP*** which was resistant in 47%. Before 2010, the date of introduction of PCV13 and PCV 10 in 2012 in Morocco; the serogroups 19, 23, 14 and 6 represented 60% of isolates of SP in children. In 2013; serotypes 14, 6B and 3 were the most frequent (more than 26%).Complications were recorded in 18, 36%***. Streptococcus pneumonia*** was the main purveyor of these complications with a clear predominance of suppurative ones (14.6%). the mortality rate reached only 2 % of cases.

Authors discuss the impact of vaccination on the microbiological profile of bacterial meningitis in children in Morocco compared to the pre-vaccination era.

ESPID-0948

FEASIBILITY OF DEVELOPING A EUROPEAN PAEDIATRIC ANTIMICROBIAL PHARMACOKINETIC/PHARMACODYNAMIC NETWORK UTILIZING OPPORTUNISTIC SAMPLING STRATEGIES

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Background and aims: Paediatric pharmacokinetic (PK) and pharmacodynamic (PD) data for antimicrobials used in children are often sparse, low-quality, or non-existent. However, advances in laboratory microanalytical techniques and the population PK approach now facilitate paediatric PK(/PD) studies conducted within routine care. In some circumstances such data can contribute directly to marketing authorisation. We aim to identify networks active within Europe that use opportunistic sampling strategies to study paediatric pharmacokinetics.

Methods: Opportunistic sampling strategies were defined as PK studies involving children receiving standard-of-care (SOC) therapy. We systematically searched for European networks using PubMed and Google.

Results: We identified 7 European networks (4 national and 3 international networks) that are planning or delivering SOC-based neonatal or paediatric PK studies:
(1) Dutch Medicines for Children Network (http://www.mcrn.nl/)
(2) United Kingdom Medicines for Children Network (www.mcrn.org.uk/)
(3) Estonian Group of Neonatal Studies
(4) Belgian Paediatric Drug Network (www.pediatrie.be/pediatricdrug.htm)
(5) PENTA-ID (www.penta-id.org/)
(6) TINN and TINN2 (www.tinn-project.org/)
(7) Global Research in Paediatrics (www.grip-network.org/)

Conclusions: Multiple national/international networks undertake SOC-based paediatric and neonatal PK research in Europe. There is an opportunity to combine skills and expertise by developing a pan-European antimicrobial pharmacokinetic research network. This network could identify optimal dosing of existing antimicrobials as recommended in formularies such as the Blue Book and BNFC and, extending to formalized PK studies, could collaborate with Enpr-EMA (European Network of Paediatric Research) and industry to implement studies of novel antimicrobials. Standardised procedures, microbiological approaches, data items and definitions would allow data warehousing to optimise the value of data collected.

ESPID-0949

BACTERIAL RT-PCR IS AN ALTERNATIVE METHOD OF DETECTING NASOPHARYNGEAL BACTERIAL CARRIAGE AND PROVIDES BETTER INFORMATION ON BACTERIAL DENSITY

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Background: Traditionally, conventional cultures are used to determine nasopharyngeal carriage of bacteria. The aim of this study was to develop and validate quantitative real-time PCR (RT-qPCR) on nasopharyngeal samples for *S.pneumoniae(*Sp), *S.pyogenes*(GAS), *N.meningitidis*(Nm)*, M.catarrhalis*(Mc)*, H.influenzae*(Hi) and *S.aureus*(Sa).

Methods: Standard strains were cultured in liquid medium and harvested in mid-logarithmic phase. Serial ten-fold dilutions were then performed on the harvested sample and plated out for culture and colony counting (CFU). RT-PCR was performed on the dilution series, generating a cycle-threshold (CT) value for each dilution and a standard curve for quantification.

Results:

Species	Target gene	Equation of CT values (y-axis) against CFU (x-axis)	Correlation coefficient (R^2)
Sp	*lytA*	y = -3.2858x + 36.729	R^2 = 0.9977
GAS	*ntpC*	y = -2.0805x + 37.369	R^2 = 0.9667
Nm	*sodC*	y = -3.3265x + 36.941	R^2 = 0.9996
Mc	*ompJ*	y = -3.1942x + 37.179	R^2 = 0.9943
Hi	*hdp*	y = -3.2778x + 36.878	R^2 = 0.9995
Sa	*nuc*	y = -2.4907x + 40.106	R^2 = 0.9972

y=mx+c where m should be close to -3.3 and c represents theoretical limit of detection (CT value)

Conclusions: Bacterial PCR is an alternative way of detecting bacterial species of the nasopharynx. The assays for *S.pneumoniae*, *N.meningitidis, M.catarrhalis* and *H.influenzae* were efficient and consistent whereas the assays for GAS and *S.aureus* were less sensitive in low density samples possibly due to inefficient DNA extraction. RT-qPCR can detect a wider range of bacterial density than culture, which is potentially important for evaluation of transmission risk.

ESPID-0950

PALATE DESTRUCTION BY ASPERGILLUS IN AN INFANT WITH ACUTE LYMPHOBLASTIC LEUKEMIA

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A 7-month-old infant was diagnosed with B-cell acute lymphoblastic leukemia and achieved complete remission after intensified induction chemotherapy. At 10 months old, after intensification chemotherapy, she developed febrile neutropenia and a 1-by-1-cm grayish/necrotic lesion on the hard palate. Broad-spectrum antibiotics and voriconazole were started with improvement. One month later, while still on antifungal treatment, she underwent another intensification chemoterapy cycle and developed a new episode of febrile neutropenia and mucositis. She was again treated with broad-spectrum antibiotics and lipossomal-amphotericin-B was substituted for voriconazole. Chest x-ray, abdominal US, echocardiogram and head/sinus CT were normal. She remained febrile for nearly 4 weeks. The palatal lesion concomitantly progressed to a 1-by-2-cm hard palatal cleft. She was transferred to PICU and intubated for upper airway obstruction. *Aspergillus nidulans* was isolated from pharyngeal/esophageal/gastric swabs and antifungals were changed to voriconazole and mycafungin due to resistance to amphotericin-B and refractory disease. Weekly serum galactomannan assays showed a steady increase (max 19) and CRP reached 398mg/L. She never recovered from neutropenia despite G-CSF treatment. Bone marrow trephine and CSF were negative for blasts. Six weeks after admission, a new squint was observed. MRI showed a retropharyngeal abscess, pachymeningeal enhancement and multiple subdural collections meaning probable CNS aspergillosis. She died soon after from overwhelming disseminated aspergillosis.

Conclusions: Palate destruction is a rare complication of Aspergillus infection and has been rarely reported. Invasive aspergillosis still causes significant morbidity and mortality particularly in patients with hematological malignancies. Primary fungal involvement in oral lesions should be considered in these patients.

ESPID-0951

COLISTIN USE IN PEDIATRIC INTENSIVE CARE UNIT: EXPERIENCE OF TWO CENTERS

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Introduction: Multi-drug resistance Gram (-) bacterias, including strains resistant to carbapenems, is emerging as a global health issue. Colistin was available in multi-drug resistance Gram (-) infections since 1950s.

Objective: To evaluate the efficacy and safety of colistin in Pediatric Intensive Care Unit (PICU).

Aims: Colistin is preferred in multi-drug resistance Gram (-) infections, especially nosocamial infections but efficacy and safety of colistin in children are unclear. We aim to evaluate the colistin use in pediatric patients with severe nosocamial infections in PICU.

Methods: The medical records of patients who were treated with colistin at two tertiary care PICUs were retrospectively reviewed.

Results: Thirty-one colistin treatment episodes in thirty pediatric patients (male/female: 20/10; median age 8,5 ages; range, 40days-19,3 years. Colistin was administered intravenously in all patient, only one patient had central-nervous system infection had received intratechal colistin therapy in addition to iv route. In 25 treatment episodes, a multi-drug resistance Gram (-)bacteria was isolated, the most common type of infection ventilator-associated pneumonia, the most isolated agent was *A.baumanii*. In 6 treatment episodes, colistin was administered empirically because of not responding to other antibiotics. Eleven patients died during colistin therapy. Four of nine patients had also fungemia. Colistin treatment was well tolerated , nephrotoxicity was seen in four episodes and neurotoxicity was not seen in any patients.

Coclusion: In our study, colistin was found to be acceptable treatment option for multi-drug resistance Gram (-) infections in pediatric patients who were treated for severe nosocamial infections at PICU. However, during the therapy renal function tests should be closely monitored especially in patients who received any other nephrotoxic agents. It's hard to evaluate neurotoxicity in patients receiving any sedative agents because of requiring mechanical ventilation.

ESPID-0952

UNUSUAL PRESENTATION OF BILATERAL NECROTIZING FASCIITIS IN THREE CHILDREN WITHIN THE SAME PERIOD IN BRUSSELS

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Necrotizing Fasciitis (NF) is a rare, rapidly progressive and life-threatening bacterial infection of the fascia and subcutaneous cellular tissue. We report 3 cases of group A Streptococcus (GAS) -related bilateral NF in apparently immunocompetent children presenting within a 2 months period in Brussels.

Two girls, 3 and 1.5 year old, were admitted for high fever and severe pain in both legs and hands, respectively. Surgery of the suspected areas was performed with a functional recovery of the first patient and fatal outcome for the second child following streptococcal toxic shock syndrome (STSS). The third patient was a 4 month old boy with a background of anal surgery who also presented STSS associated with meningitis and otitis media. His clinical progress was complicated with NF of both flanks, requiring two large consecutive debridements, with favorable evolution. Hematogenous spread of GAS of the upper respiratory tract was the most probable cause of NF in our patients and could explain the bilateral expression. Molecular identification of the streptococcal strains had been made for all three patients and showed variable superantigens.

A severe pain, out of proportion to physical examination findings, should raise high index of suspicion of NF. The most important diagnostic tools are the "finger test" and an emergent surgical exploration with a frozen biopsy. We underline the importance of an early diagnosis and a multidisciplinary approach of the patients diagnosed with NF in order to decrease mortality and morbidity.

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ESPID-0953

IMMUNE MEDIATED ENCEPHALITIS IN A PREVIOUS STABLE HIV1-INFECTED CHILD

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The central nervous system (CNS) is one of the targets of HIV-infection and neurological disease is one of the main concerns even in well controlled HIV patients.

We describe a vertically HIV type 1 -infected 13-year-old boy, with a non progressive spastic diplegia and slight cognitive impairment, with viral load (VL) < 40 copies/ml and no immunossupression ongoing combined antiretroviral therapy (cART) for 10 years. He presented with acute encephalopathy (headaches, psychomotor slowing, hemiparesis) related to a virological escape with VL in plasma 2589 copies/mL and 6062 copies/mL in CSF, and CD4 count 477,8/µL. Brain MRI showed HIV encephalopathy sequelae and temporal lobes high sinal. The cART was changed to Nevirapine, Darunavir/r, Raltegravir based on the genotypic resistant study, and clinical improvement was observed. Two weeks later he had severe headaches, strabism and papiledema. CSF showed pleocytosis, high pressure and undetectable HIV1-VL. Extensive microbiological studies remained negative for other virus, fungi and bacteria (culture, antigen, polymerase-chain-reaction and serology). Brain MRI revealed bilateral diffuse T2 and Flair high sinal intensities localized in white and gray matter quickly progressive compared to previous study. Postgadolinium T1 didn't show enhanced lesions. He was treated with 3pulses of IV methylprednisolone followed by oral prednisolone with rapid clinical and imagiological improvement.

This case could be included in the spectrum of the recently described (in adults) CD8 encephalitis – though no specific studies were made to confirm it. Immune / inflammatory encephalitis should be considered in a HIV patient with normal CD4 counts in a virological escape.

ESPID-0954

ISOLATED ACUTE APPENDICITIS DUE TO ASPERGILLUS CARNEUS IN A NEUTROPENIC CHILD WITH ACUTE MYELOID LEUKEMIA

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Introduction. A 6 year boy affected by AML FAB M5 was treated according to the AIEOP AML 2002/01 protocol. During neutropenia he received prophylaxis with acyclovir, ciprofloxacin and fluconazol. Sixteen days after chemotherapy the patient developed fever and treatment was intensified with meropenem and liposomial amphotericin B (LAMB). After five days of persisting fever he developed severe abdominal pain into the right lower quadrant. Abdominal ultra sound was consistent with acute appendicitis and the patient underwent appendectomy with prompt defervescence. Histopathology of the resected vermiform appendix showed gangrenous inflammation and secondary periappendiceal peritonitis. PAS-+ fungal elements were present even in the vessels, demonstrating angioinvasion. Results. *Aspergillus carneus* was detected in the bioptic specimen. Treatment with voriconazole was promptly started and was successful. Galattomannans, still positive one week after appendicectomy, became negative after 2 weeks of treatment. No other sites of Aspergillus localization were detected. **Conclusion:** Appendicitis is rarely caused by fungal microorganisms and isolated intestinal aspergillosis without pulmonary infection is unusual. *Aspergillus carneus* is a rare species of Aspergillus formerly placed in section Flavipedes and recently included in section *terrei*. To our knowledge this is the first report of a human infection due to this mould. In vivo and in vitro data indicate that almost all *A. terreus* are intrinsically resistant to LAMB and even if LAMB susceptibility is not associated with loss of virulence, data on resistance are crucial for outcome. Although our observation need to be further confirmed, this report may suggest LAMB resistance even in *A. carneus.*

ESPID-0955

IS PERSISTENT THROMBOCYTOPENIA A LONG TERM SEQUELAE IN CONGENITAL CMV INFECTION?

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Background and aims: Clinical presentation of congenital CMV often includes thrombocytopenia, which usually resolves with treatment of infection. We report the case of a baby affected by congenital CMV with persistent isolated thrombocytopenia without other haematological diagnosis

Methods: Case report

Results: Aurora is a premature baby born at 35 weeks of gestational age, SGA with severe thrombocytopenia (19000/mm3) by mother with CMV seroconversion at the second trimester of pregnancy. At birth cerebral ultrasound showed subependymal hemorrage, thus she underwent platelet transfusion. Urine CMV PCR confirmed congenital CMV and she was started on ganciclovir (12mg/kg/day) with control of viremia. After 3 weeks she was shifted on valganciclovir (30mg/kg/day) for 3 more weeks. Abdominal ultrasound, ocular, neurological and audiological examinations were normal whether brain MRI showed findings consistent with CMV infection. Platelets increased (50000/mm3) but failed to return normal. One week after discontinuation therapy she was hospitalized for suspected infectious enteritis and persistent thrombocytopenia (38000/mm3). Bone marrow examination showed relatively rare megakaryocytes; thus molecular investigations for congenital amegakaryocytosis was performed and resulted negative. Virological examination on bone marrow turned positive for CMV and blood viral load was positive again: we decided for 3 more weeks of valganciclovir with good control of viremia and partial control of thrombocytopenia. At 18 months follow up the baby was fine with platelets stabilized around 80000/mm3, negative viral load, normal audiological, neurological and ophthalmic examinations and significant improvement of cerebral MRI

Conclusions: to our knowledge this is the first report of persistent thrombocytopenia in CMV congenital infection

ESPID-0956

INNOVATION IN THE USE OF NEW MONOCLONAL ANTIBODIES IN THE TREATMENT OF PAEDIATRIC INFECTIOUS DISEASES

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PIP*	Active Substance / Invented name	Treat/ Prevent	Condition	Population	Studies agreed in the opinion	Date of completion of the PIP	EPAR**
EMEA-001309-PIP01-12	Palivizumab / Synagis	P	Lower respiratory tract disease caused by RSV	- ≤ 35 weeks GE and < 6 months of age at the onset of the RSV season. - < 2 yrs and requiring treatment for bronchopulmonary dysplasia within the last 6 months / with haemodynamically significant congenital heart disease	1. Double-Blind, randomized study to evaluate the **safety**, **tolerability**, and **pharmacokinetics** 2. Randomized, double-blind, two-period, cross-over study to evaluated the **pharmacokinetics**, **safety** and **tolerability** of a liquid formulation	By July 2004	YES
EMEA-000352-PIP01-08-M01	Motavizumab	P	Serious lower respiratory tract disease caused by RSV	From birth to < than 2 years	1. A Study for the Prevention of RSV Disease Among Native American Infants. 2. A Study to Evaluate the **Safety**, **Tolerability**, **Pharmacokinetics**, and **Immunogenicity**	By March 2009	NO
EMEA-001394-PIP01-12	Clostridium difficile toxin A human monoclonal antibody / Clostridium difficile toxin B human monoclonal antibody	T	Treatment of Clostridium difficile infection	From birth to < 18 years of age	1. Randomised, double-blind, single dose, placebo controlled trial to evaluate **efficacy**, **safety** and **pharmacokinetics** 2. Open label, single dose trial to evaluate **safety**, **tolerability**, and **pharmacokinetics**	By Jan 2020	NO
EMA-000608-PIP01-09	Pagibaximab	P	Bacterial sepsis	Preterm newborns with body weight from 500g to less than or equal to 1200g	1. A multi-centre, randomized, double-blind, placebo controlled trial to evaluate the **safety** and **efficacy** 2. A multi-centre, randomized, double-blind, placebo controlled trial to evaluate the **safety** and **efficacy** 3. **Pharmacokinetics** and **safety**, open label multiple dose trial	By Jan 2014	NO
EMEA-001134-PIP01-11	Chimeric monoclonal anti-Shiga toxin (Stx) antibodies cαStx1 and cαStx2	P	Shiga toxin-mediated complications	From birth to < 18 years of age	1. Double blind, randomised, multicentre, single dose, three arm, placebo-controlled trial to evaluate the **safety** and **tolerability** 2. Double blind, randomised, multicentre, single dose, placebo-controlled trial to evaluate the **efficacy**	By Dec 2015	NO

*PIP: Paediatric Investigation Plan; **EPAR: European Public Assessment Reports

BACKGROUND AND AIMS

Considering the emergence of multidrug-resistant microorganisms and the paucity of new molecules available for treatment, it has become evident that antimicrobials cannot provide the ultimate solution in the fight against infections. Looking for solutions to overcome this problem, biotechnologies are currently focused on the development of monoclonal antibodies (mAbs) specifically addressed to both prevention and treatment of infectious diseases. Nevertheless, in paediatric population, the number of Paediatric Investigation Plans (PIPs) submitted to European Medicines Agency (EMA) are very low. The aim of our study was to review the PIPs-opinions regarding antimicrobial mAbs in order to encourage a discussion among the scientific community on the development of the new co-strategies for the management of infectious diseases in children.

METHODS

PIPs on antimicrobial mAbs were systematically reviewed through the EMA website.

RESULTS

Overall, 5 opinions on PIPs focused on antimicrobial mAbs have been agreed by EMA since 2007. Among these, 4 PIPs were dedicated to mAbs developed to prevent infections whereas only 1 was focus on mAb proposed to treat an infection. However, of these, only one anti-infective mAb is currently approved in paediatric population. See table.

CONCLUSION

Considering the paucity of available data, the awareness of the research community on this topic is mandatory in order to highlight this need and promote a collaboration among all the stakeholders.

ESPID-0957

NEONATAL GROUP B STREPTOCOCCUS SURVEILLANCE STUDY 2003-2013 IN WEST HERTFORDSHIRE: THE NEONATAL PROFILE

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Introduction

Group B streptococcus (GBS) remains the most important cause of neonatal morbidity and mortality in high income countries, accounting for 58% of early onset sepsis in the UK.

Aim

To estimate incidence and identify clinical features of our cohort.

Methods

This retrospective study, 1st January 2003 to 1st January 2014, identified 41 infants <3 months with GBS culture positive sterile samples. A standardised proforma was completed for each child with positive GBS culture including relevant clinical details.

Results

77% babies were >37 weeks gestation, with mean birth weight 3.22kg ±SD 0.96kg. The most frequent presentations included respiratory distress, poor feeding and temperature instability.

Incidence of early onset disease was 0.49 per 1000 live births and late onset disease 0.22 per 1000 live births. Blood cultures were positive in all cases, however, only one cerebrospinal fluid (CSF) cultured GBS. The diagnosis of meningitis was made in 3 further cases based on cell count, with negative CSF.

Median serum CRP values showed significant increase ($p<0.0001$) between day 1, 8.3mg/l (5.0-16.4) and day 2 of illness, 85.0mg/l (48.3-145.8). Ventilation was required in 16.7% and inotropic support in 6.7%. In this cohort the case fatality rate was 2.4% (n=1) and neurological morbidity rate 25.0% (n=1).

Discussion

Local incidence of GBS disease is equivalent to reported UK incidence but lower than a 1993-1998 South Bedfordshire study, geographically adjacent to our population. This data supports serial CRP monitoring to guide treatment. Our morbidity and case fatality rates were lower than those reported in the literature.

ESPID-0958

NEONATAL GROUP B STREPTOCOCCUS SURVEILLANCE STUDY 2003-2013 IN WEST HERTFORDSHIRE: THE MATERNAL PROFILE

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Introduction

Group B streptococcus (GBS) is the most common pathogen affecting neonates in the UK, despite the efforts towards implementing a risk-based approach to prophylaxis.

Aim

This study aims to profile the maternal characteristics associated with local neonatal GBS disease.

Methods

This retrospective study, 1st January 2003 to 1st January 2014, identified infants <3 months with GBS culture positive sterile samples. A standardised proforma was completed for each child with positive GBS culture including relevant maternal details.

Results

The decade long study identified 41 mothers of neonates with GBS disease. Mean maternal age was 30.71± SD 3.85 years and primiparous women accounted for 60% of the GBS cases, with 29% para 1, 4% para 2, 7% para 3. No mothers had HIV on antenatal screening. Risk factors for sepsis were identified in 60% of mothers (with 24% having multiple risk factors). Intrapartum antibiotic prophylaxis was documented in only 4 cases (13%). If IAP (assumed efficacy 80%) had been given to all women with ≥1 risk factor, 8 cases of early onset disease (EOD) could have been prevented.

Conclusion

In the UK, the risk-based approach to GBS prophylaxis relies upon timely identification of risk factors to provide appropriate maternal antibiotics. However, this data and others suggests we are failing to optimise care. Local incidence of EOD of 0.49 per 1000 live births is in keeping with other UK data but contrasts with data from USA (0.34 per 1000 live births) where universal GBS screening is the norm.

ESPID-0959

RISKS OF NATURAL PRODUCT MARKETS: BRUCELLOSIS IN TWO PEDIATRIC PATIENTS DUE TO CONSUMPTION OF UNPASTEURIZED GOAT MILK

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Introduction

Although humans are accidental hosts, brucellosis continues to be the most common zoonotic infection and a major health concern worldwide.

Background

We present 2 clinical cases of a boy and a girl about 7 years old from different families, who were hospitalized in our department during May 2013. Both children were presented with prolonged fever, joint pain and splenomegaly. *Brucella melitensis* was isolated in blood culture and Wright reaction was positive (title 1/2560) in both cases. The patients had consumed unpasteurized goat milk from the same natural product market, which fueled the milk from a local farm. The children were treated with cotrimoxazole and rifampicin orally but both of them developed a drug induced rash. The girl then completed a 6-week treatment with gentamycin and ciprofloxacin while the boy was treated with gentamycin and doxycycline.

Results

A month later both patients were asymptomatic and the title of Wright reaction was 1/640. No relapse occurred the following 8 months.

Conclusion

B. melitensis may be acquired via exposure to animals or animal products but ingestion of unpasteurized goat milk and related dairy products is the main route by which *B. melitensis* is transmitted to humans. Incidental cases, just like these that we describe, arise as a result of relaxation of surveillance standards or because of the increasing international exchange of foodstuffs and dairy products by natural product markets that do not meet requirements of safety.

ESPID-0960

EPIDEMIOLOGY OF RSV INFECTION IN GREEK CHILDREN HOSPITALIZED FOR RESPIRATORY INFECTION IN A TERTIARY PEDIATRIC HOSPITAL, DURING A 25-YEARS PERIOD

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Epidemiology of RSV infection in Greek children hospitalized for respiratory infection in a Tertiary Pediatric Hospital, during a 25-years period

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Background and aims: Human respiratory syncytial virus (RSV) is one of the most clinically important viruses infecting young children, the elderly, and the immunocompromised. Although RSV infection is associated with substantial morbidity, hospitalization and even mortality, the total disease burden remains unknown. The aim of this study was to estimate the prevalence and the epidemiological characteristics of RSV infection in our area during a 25-years period.

Methods: This is a retrospective study of laboratory and medical records of hospitalized children who had a rapid RSV immunoassay performed because of respiratory tract infection. The setting of the study was "Aghia Sophia Children's Hospital", the major tertiary pediatric hospital in Greece and the study period from 1989-2013.

Results: During the 25-years study period 7.365 children were tested and RSV was detected in 1912 (25.96%). RSV detection was higher during January – March. Positivity rate of RSV was higher in children aged 0-12 years who had an RSV test performed, and decreased with increasing age. Positivity rate of RSV was higher through years 2000-2013 (26,58%) than the previous decade 1989-1999 (19,58%). A peak of RSV infection was measured in 1989 (34%), 2000 (37,6%), 2002 (36,6%), 2003 (37,1%) and 2013 (27,3%).

Conclusions: During the study period RSV infection was detected in 1:4 children hospitalized with respiratory infection. The incidence was higher in younger children and during the winter months. RSV infections were found to increase every 5-8 years, indicating that although the virus circulates annually, significant escalation of incidence and hospitalization occurs periodically.

ESPID-0961

INCIDENCE AND OUTCOME OF CONGENITAL CYTOMEGALOVIRUS INFECTION

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Introduction

The congenital infection with cytomegalovirus (CMV) can occur in newborns of women with reinfection or reactivation of a pre-pregnancy CMV infection.

Objective

The aim of our study was to evaluate the incidence and clinical outcome of the congenital infection with CMV .

Material and methods

We conducted a retrospective analysis of all charts of newborns delivered between 2012-2013 in Neonatology Department of Obstetrics and Gynecology I Clinic Cluj-Napoca (Romania). Diagnosis of congenital CMV infection was based on clinical findings, ultrasound and immunological assessment (IgM and IgG).
Results

Among 3861 newborns delivered between 2012-2013, five were diagnosed with congenital CMV infection(1,2‰). None of the mothers of congenital CMV patients had TORCH syndrome immunological assessment during pregnancy.

Four (80%) of five CMV patients were term neonates and one was preterm. Three newborns out of five presented hypotrophy, while four of them had splenomegaly, petechiae and thrombocytopenia. One neonate presented no common clinical findings of congenital CMV infection. All five patients presented calcifications (mainly thalamic) on head ultrasound and had increased IgM and IgG values.

The ophthalmic examination was negative at all patients from the study group, while three of them (60%) presented hearing loss on audiological examination.

The immediate evolution was favorable in all five patients

Conclusions:

We observed a low incidence of congenital CMV infection in our study. The main finding at our study group was the calcification of the brain(100%). Immediate outcome was not affected. Long term outcome has to be determined.

ESPID-0962

MOLECULAR CHARACTERIZATION OF ROTAVIRUS IN CHILDREN IN 2012 - THE FOLLOW-UP (*)

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Background and aims: Dominant rotavirus strains presently circulating in Central Europe include G1P[8], G2P[4], G4P[8] and G9P[8]. In 2011, the most common rotavirus strain on our ward was the G9P[6].

We present molecular changeability of rotavirus genotypes (G and P types) and their characteristics of group A and viral enterotoxin (VP6 and NSP4) in samples collected from the selected group of children below 5 years of age.

Material and Methods: We reviewed 475 cases with acute gastroenteritis hospitalized in Department of Pediatrics in 2012. Rotaviruses were detected in 188 (39,6%) samples, nosocomial infections accounted for 44 (23,4%). Genotypes of rotaviruses were determined in randomly selected samples by a reverse transcription-polymerase chain reaction, according to their protein capsids VP6, VP4, VP7 and NSP4.

Results: The genotyping of 50 rotaviruses indicate a predominance of the G9–42%, followed by the G2–18%, the G4–12%, the G1 and G3–2%. Coexistence of strains was 20%– common combination the G4G9–16%. Most G-strains were associated with the P[4]P[6] co-infection–68%, followed by the P[6]–12%. The rotavirus group A (human) was found in almost all (94%) and NSP4 in half (52%) of the samples. A clear seasonal variability of the strains was not observed.

Conclusions: In 2012, compared to 2011, the most common was still G9, while the P[4]P[6] co-infection was definitely predominant. Active surveillance should be maintained- dominance of certain genotypes differs within the same geographic area from year to year and new reassortants may appear.

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ESPID-0963

THE EFFECTS OF LIVE ATTENUATED INFLUENZA VACCINE ON CARRIAGE AND DENSITY OF NASOPHARYNGEAL BACTERIA IN HEALTHY CHILDREN

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Background and aims: Bacterial colonisation of the nasopharynx may be influenced by viral infections of the respiratory tract. Live attenuated influenza vaccine (LAIV) causes mild infection of the nasal mucosa. We investigated the effects of LAIV on bacteria in healthy children.

Methods: 151 (24-50 month old) children were recruited into a randomised controlled study to start LAIV either at an initial study visit or one month later, with nasopharyngeal swabs taken pre-vaccination as well as 7 and 28 days after each dose, allowing comparisons both between vaccinated and unvaccinated children and pre- and post- vaccine. Swabs were analysed using bacterial RT-quantitative PCR for *S.pneumoniae*(Sp), *M.catarrhalis(*Mc)*, H.influenzae*(Hi) and *S.aureus*(Sa)*.*

Results:

	LAIV group			Control group		
	Day 0	Day 7	Day 28	Day 0	Day 7	Day 28
Sp	2730	3850	13100	3330	3170	2250
Mc	13900	16000	28300	15400	16600	20400
Hi	24500	45600	84400	19800	11900	39600
Sa	1880	21800	229000	741	15500	216

LAIV did not affect carriage rates of the four bacterial species reported. Non-significant trends towards increased colonisation density of Sp (6-fold at day 28, p=0.18), Hi (4-fold at day 7, p=0.12) and Sa (1000-fold at day 28, p=0.14) were observed in vaccinated children when compared with controls.

Conclusions:

No significant changes in bacterial carriage rates or densities were induced by LAIV in this randomised controlled study. Given the well known association between influenza and bacterial infections, these results are reassuring for the safety of this vaccine.

ESPID-0964

A QUARTER OF NEONATES WITH CULUTURE-PROVEN LATE-ONSET SEPSIS (LOS) HAVE MENINGITIS

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Background and aims. Neonatal meningitis is a serious disease with possible neurological sequelae, but specific symptoms may be absent or subtle. Whether or not all babies with LOS need to undergo lumbar puncture (LP) remains controversial. We aimed to determine the incidence of bacterial meningitis in neonates with LOS.

Methods. Subanalysis of single centre data from prospective multi-centre studies NEOMERO 1 and NEOMERO 2. All infants up to 90 days of age with LOS included into the abovementioned studies in Tallinn Children`s Hospital were analysed.

Results. Overall 30 newborns with median (range) post-conceptional age of 32 (25-46) weeks and weight of 1370 (634 – 5500) grams at the time of LOS were included. LP was unsuccessful in 1; culture-proven LOS was diagnosed in 18 neonates. Elevated white blood cell (WBC) count (≥20 X 10 mm^3) in cerebrospinal fluid (CSF) was found in 12/29 (41,4%) infants; 5 of them plus 1 infant with normal CSF WBC count had positive CSF culture. Bacteria detected in CSF were *Enterobacter cloacae, Klebsiella oxytoca, Enterococcus faecalis, Staphylococcus aureus and Coagulase negative staphylococcus*. In 4 neonates the same bacteria were detected in blood and CSF. The incidence of culture-proven meningitis in neonates with culture-proven LOS was 4/18 (22%) and with clinical LOS 2/12 (17%).

Conclusions. Given the high incidence of meningitis in both culture proven and clinical LOS infants with suspected LOS should undergo LP to exclude meningitis as antibiotic dose adjustment may be warranted. The success-rate of LP can be high even in the smallest infants.

ESPID-0965

HERPES ZOSTER IN CHILDREN IN ERA OF ANTIVIRALS - A SINGLE CENTRE EXPERIENCE

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It is widely assumed that the clinical course of shingles is more serious in immunocompromised children.
The aim of the study was to estimate the influence of acyclovir treatment on clinical presentation of herpes zoster in children.
Material and methods: we reviewed 72 charts of children (including 35 girls, mean age 10.0y) treated with acyclovir due to shingles in the Department of Pediatrics and Infectious Diseases in Wroclaw in Poland during last 19-years. The majority of children (46/72) were immunocompromised.
Results: the average age of chickenpox was significantly higher in immunocompromised children (5.6y vs 3.2y in immuno-competent) with significantly less varicella cases during infancy (0 vs 8 children). The age of herpes zoster occurrence did not differ significantly (10.5 vs 9.1 y) as neither did the hospitalization period (8.2 vs 6.6 days),and also the location and extent of the skin eruption were similarly placed. Thoracic dermatomes were the most frequent location. General symptoms were noted more often in the immunocompetent patients (21/26 vs 26/46). Most common symptoms were fever, rash-related pain and itching.
Conclusion: The aciclovir therapy resulted in similar clinical presentation of the herpes zoster in all children regardless their immune status. Chickenpox in the first year of life is a risk factor for early reactivation of VZV and herpes zoster in childhood.

ESPID-0967

ROTAVIRUS VACCINATION COVERAGE IN CHILDREN IN 2011-2013 (*)

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Background and aims: In 2011-2013, National Institute of Hygiene reported over 75 thousand cases of rotavirus gastroenteritis (RVGE) in children below 2 years of age and the vast majority were hospitalizations. The burden of acute RVGE is still underestimated because the surveillance system is not efficient. RVGE can be prevented by vaccination, which is recommended (extra charge) in Poland.

The aim of this study was to estimate the vaccine coverage in children hospitalized on our ward.

Methods: We retrospectively reviewed 7590 medical histories of all children admitted to the one Department of Pediatrics in Warsaw in 2011-2013 (3 years).

Results:

	2011	**2012**	**2013**
No. of hospitalizations	2908	2420	2262
No. of all GE	575	475	318
No. of RVGE	248	188	85
RVGE/GE (%)	43,1	39,6	26,7
Vaccination coverage of all patients (%)	16,2	19	16,5
Vaccination coverage of patients with RVGE (%)	8,5	11,7	4%

Currently, we present results in detail of the 2011. The vast majority of children received the monovalent vaccine (90,3%). Among children with RVGE, who received rotavirus vaccine 24% had nosocomial infection.

2011	**1**	**2**	**3**
Received doses (%)	14,3	80,2	5,5

Conclusions: Vaccination coverage was accounted for maximum 19% and it remains too low to have a significant effect on the burden of acute RVGE. RV Universal Mass Vaccination in Poland is needed to protect against RVGE from the youngest age and to reduce the number of hospitalization.

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ESPID-0969

SIMILAR PNEUMOCOCCAL COLONISATION RATES AND DENSITY IN ACUTE OTITIS MEDIA WITH SPONTANEOUS OTORRHOEA AND HEALTH: OTHER OTOPATHOGENS HAVE LOWER DENSITY

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Background and aims: Comparisons of rates and/or densities of *S. pneumoniae* carriage in health and disease have generated inconsistent results perhaps because of heterogeneous control groups. We compared patterns of nasopharyngeal colonisation in healthy children attending daycare centres (DCCs) with those in children with acute otitis media with spontaneous otorrhoea (AOMSO).

Methods: In the winter-spring 2011 we swabbed 515 children in DCCs in Coimbra and 107 presenting to our Emergency Service with AOMSO. Nasopharyngeal swabs were stored at -80°C in STGG broth and cultured using standard techniques. *S. pneumoniae*, *H. influenzae*, *M. catarrhalis*, *S. aureus* and *S. pyogenes* were identified and densities assessed by scoring colony numbers (0= not detected; 1= 1–5 colonies/50µL broth; 2= >5–20; 3= >20–50; 4= >50–100; 5= >100).

Results: Mean ages were 37.5M for children with AOMSO and 39.1M for children in DCCs (p=0.002); 80% of children with AOMSO attended nurseries (p=<0.001). By univariate analysis, rates of colonisation and mean densities did not differ between the two groups apart from *M. catarrhalis* which had lower density in AOMSO. By multivariate analysis, colonisation densities for both *H. influenzae* and *M. catarrhalis* were lower in AOMSO. The mean number of bacterial species identified was similar in the two groups (1.7 versus 1.8; p=0.674).

Conclusions: Children with AOMSO did not have higher rates or densities of nasopharyngeal *S. pneumoniae* but had significantly lower densities of both *H. influenzae* and *M. catarrhalis*. This relative imbalance between species in otitis may indicate ecological conditions associated with disease.

ESPID-0970

NASOPHARYNGEAL COLONISATION WITH PNEUMOCOCCUS IS ASSOCIATED WITH RHINITIS IN HEALTHY PRESCHOOL CHILDREN - CLUES ABOUT EFFICIENT TRANSMISSION OF THIS BACTERIUM

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Background and aims: Pneumococcus (Sp) is carried by high proportions of pre-school children, especially in daycare. Effects on transmission are important for pneumococcal conjugate vaccine effectiveness.

Methods: 586 children in daycare in Coimbra Portugal, had nasal swabs taken into STGG and rhinitis symptoms and demographics recorded in March 2010. Samples underwent bacterial culture and RT-PCR for respiratory viruses. Multivariate analysis was done to find associations that were independent of age. Differences described were statistically significant if $p<0.05$.

Results: Detection rates were: Sp 59%; *H. influenzae* (Hi) 52%, *M. catarrhalis* (Mc) 69%, *S. aureus* (Sa) 16% and viruses 58%. There was a strong age-independent association between both the presence and density of Sp and the presence and severity of rhinitis. Although weaker, such associations were also observed for Hi and Mc. The presence and density of these two species was also significantly and age-independently associated with the presence and density of Sp. There was a highly significant negative age-independent association between Mc and Sa. In contrast to our previous study, clear associations between Sp and viral infection were not observed.

Conclusions: This study suggests that describing Sp nasopharyngeal colonisation as asymptomatic, as is common practice, may be misleading. Whether Sp causes rhinitis, rhinitis induces proliferation of Sp, or both (or neither) remains uncertain. As successful colonisation and transmission are the two prerequisites for Sp survival, understanding the determinants of the latter is a research priority as conjugate vaccine usage and impact grows.

ESPID-0971

TRENDS IN PNEUMOCOCCAL (SP) NASOPHARYNGEAL COLONISATION RATES AND DIVERSITY IN CHILDREN ATTENDING NURSERIES AFTER 6-9 YEARS OF NON-UNIVERSAL VACCINE USE

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Background and aims: Studies in the US have shown disappearance to near extinction of Sp vaccine types (VT) from paediatric carriage after 5-7Y of vaccine use with transient increases in serotype diversity during the first 2-4Y. PCV7 coverage in Portugal rose from 32% in 2002 to 79% in 2007, falling slightly after that. We monitored trends in rates and diversity, 6-9Y after vaccine introduction.

Methods: From 2007 to 2010, we swabbed 500-600 children attending the same nurseries in Coimbra, Portugal in winter. The Simpson index of diversity (D) was used to assess diversity.

Results: Clinical and demographic characteristics did not change. *Sp* colonisation rates were: 2010=58.5%, 2009=51.3%, 2008=54.5% and 2007=60.6% The increase in 2010 was due in part to an increase in non-VT (2010=47%; 2009=42.6%; 2008=45.8% and 2007=43.3%) but mostly due to increased serotype 19F. In 2010 serotype 18C was detected in one child but no other VT were found, consistent with their earlier reduction and disappearance. Over the years there were individual fluctuations of non-VT but none showed obvious trends.

The number of serotypes was: 2010-2009-2007=27, 2008=26. The corresponding D index was: 2010=0.9334, 2009=0.9405, 2008=0.9220 and 2007=0.9366, again showing some fluctuation but no progressive trend.

Conclusions. There was a net increase in colonisation in 2010 partly due to increase in non-VT but mostly to an increase in 19F. The diversity remained high without a progressive trend. The introduction of PCV13 may have driven further changes rendering further studies important for the understanding of what remains an evolving situation.

ESPID-0972

MYCOBACTERIUM FORTUITUM INFECTION IN A CHILD WITH GENERALIZED LYMPHADENOPATHY AND MARKED NEUTROPHILIA DUE TO COMPLETE INTERFERON GAMMA RECEPTOR 1 DEFICIENCY

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Background: *Mycobacterium fortuitum* is a non-tuberculous mycobacteria and is ubiquitously found in nature. Pneumonia, skin and soft tissue infections are the most prevalent clinical manifestations affecting usually immunocompromised patients.

Case: A 4-year-old boy born to non-consanguineous parents presented with recurrent high fever, cervical lymphadenopathy, desquamation of palms and soles, maintaining otherwise good clinical appearance. In early infancy salmonella gastroenteritis required intravenous antibiotic therapy. Blood test revealed marked neutrophilia (>100.000cells/mm3), raised inflammatory markers (CRP 250mg/l), hypergammaglobulinemia (IgG 2100mg/dl) and high Vitamin B12 levels (>1200ng/L). An initial infectious work up including blood cultures, viral PCRs, Mantoux and serology were found to be negative. A CT chest scan and abdominal ultrasound revealed multiple lymphadenopathies. Bone marrow aspirations and lymphnode biopsies were repeatedly performed and finally isolated *M. fortuitum* from the lymphnode tissue. Azithromycin, ciprofloxacin and co-trimoxazol were started resulting in complete clinical recovery. Further immunology investigations showed a complete absence of IFN-gamma responses measured as TNF-alpha and IL-12p70 production, IFN-gamma receptor 1 expression on monocytes and EBV-transformed B cells was severely reduced compared with a healthy control. DNA sequencing detected a heterozygous compound mutation c.523delT/c.652_654delGAA in the IFNGR1 gene confirming the diagnosis of a recessive complete Interferon gamma receptor 1 deficiency. The patient remains clinically well continuing on triple combination therapy and is planned to receive a fully matched family donor stem cell transplantation.

Conclusion: Disseminated disease of M. fortuitum is rare and in absence of other infectious agents, inborn errors of the IFN-gamma/IL-12 pathway (Mendelian Susceptibility to Mycobacterial Disease) should be considered.

ESPID-0973

MYCOBACTERIUM CHELONAE PNEUMONIA IN AN 11-MONTH-OLD BOY WITH CHRONIC GRANULOMATOUS DISEASE

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BACKGROUND

Chronic granulomatous disease (CGD) is an uncommon inherited disease with a defect in the NADPH-oxydase involved in the phagocytosis of catalase-positive microorganisms by neutrophils and macrophages. Infections may involve any organ. Pneumonia is a recurrent problem in CGD. *Staphylococcus aureus, Aspergillus, Nocardia, S. marcescens, Pseudomonas* spp., *Burkholderia cepacia* are common pathogens but our case illustrates that other germs can also be causative.

CASE REPORT

An 11-month-old boy presented with three weeks of persistent fever and mild respiratory symptoms. General condition remains good. First investigations revealed a left axillary pulmonary condensation. Abdominal ultrasound and echocardiography were normal. Tuberculin skin test was negative and microscopy of gastric aspirates did not show any acid fast bacilli. The patient was empirically treated with Amoxicillin-Clavulanic Acid during seven days. Due to absence of response to treatment, persistent pneumonia and suspicion of CGD (mother is carrier), a bronchoalveolar lavage (BAL) was performed. BAL did not show any physical abnormalities. He was then treated with Clindamycin and Cotrimoxazole for one week and later on only with Cotrimoxazole. Neutrophil function testing revealed a slight shift of the peak of production of hydrogen peroxide. Finally, culture from BAL grew for *Mycobacterium chelonae* and Clarithromycin was added.

CONCLUSION

CDG is a rare cause of persistent fever in children. Early aggressive microbiological diagnosis is mandatory to guide appropriate antibiotherapy. This case illustrates that unusual bacteria like *Mycobacterium chelonae* can cause pneumonia in CGD.

ESPID-0974

REPTILE ASSOCIATED SALMONELLOSIS: TIME FOR A NEW PUBLIC HEALTH APPROACH

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Background-ownership of exotic pets, particulary reptiles, has increases in Ireland over the last decade.
Aims- to describe two cases of reptile-associated salmonellosis in young infants, review the national epidemiology and survey information provided by pet shops to potential owners of reptile.
Methods-retrospective chart review, data analysis of annual reports from National Salmonella Laboratory and national telephone survey of pet shops.
Results-two boys aged 8 and 5 weeks respectively, presented with pyrexia, diarrhoea, lethargy and dehydration. Stool cultures were positive for *Salmonella enterica subspecies enterica* serotype Stanley and Give,respectively.Both families had pet reptiles:a bearded dragon and tree lizards.*Salmonella* Stanley and Give were isolated from the respective reptiles.While parents "always washed their hands after handling them", reptiles were washed in the family bathtub and allowed roam the house freely.
Between 2009-12 an average of 22 cases/year of exotic pet (predominantly reptile)-associated salmonellosis occured in young children (5 infants <6 months).Pet reptiles included terrapins,turtles,snakes,bearded dragons and lizards.In the national telephone survey 6 of 10 exotic pet shops were unaware of any potential health risks from keeping reptiles in household with young children. Reptiles were considered "perfectly clean pets".
Conclusions- CDC and HPSC publications that advise against keeping reptiles in any household with young children do not appear to be reaching some of their target audience. If public education is the approach chosen to reduce reptile-associated salmonellosis rather then legislation or import restriction, which have been effective elsewhere, information campaigns targeting potential reptile owners at point of sale should be explored.

ESPID-0975

MANAGEMENT OF CANDIDAL THROMBOPHLEBITIS OF CENTRAL VEINS IN A NEONATE

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Background and aims

The use of central venous catheters (CVCs) in newborns is hampered by a number of complications such as bacterial or fungal infections and deep veins thrombosis.

Catheter-related thrombosis can be complicated by *Candida albicans* infection in newborns and its management is poorly described in literature, thus we report our experience.

Methods

We describe the case of a 1 month-old girl with Candidal Thrombophlebitis of Central Veins (CTCV).

Results

A 1 month-old girl with intracranial malformation was admitted in critical condition and CVC was placed in her femoral vein. On day 52 of life, diagnosis of iliofemoral and inferior vena cava thrombosis was made and Enoxaparin was started (300UI/Kg/day). On day 80 the patient presented with fever, increased level of C-reactive protein (CRP) and blood cultures showed *Candida albicans*, therefore CVC was removed and she started L-Amphotericin B (2 mg/kg/day). Blood cultures after one week remained positive for *Candida Albicans* and thrombosis showed increased size. Therefore, we shifted to a combination therapy with Micafungin (15mg/kg/day for 3 days, then 8 mg/kg/day) plus L-Amphotericin B (3 mg/kg on day 1; 5 mg/kg on day 2; 7mg/kg/day for 1 week; 5 mg/kg/day until end of treatment). After 4 days, blood cultures became negative and general condition rapidly improved. Antifungal therapy was discontinued after 35 days of Micafungin and 19 days of L-Amphotericin B.

Conclusions

Our experience suggests that antifungal combined treatment in newborns with CTCV can be effective when not responding to first line therapy, although further studies are needed.

ESPID-0977

CHANGES IN THE EPIDEMIOLOGY OF ROTAVIRUS ACUTE GASTROENTERITIS (RVAG) OVER SEVEN YEARS OF VACCINE USE IN PORTUGAL

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Introduction: Countries with rotavirus vaccines in their National Immunisation Programme (NIP) have reported significant reductions in RVAG cases, changes in seasonality and average age of disease. In Portugal, although not yet included in NIP, two rotavirus vaccines have been available on the private market since May 2006 with estimated coverage rising from 16 to 46% between 2007 and 2013. The aim of this study was to identify trends in RVAG presenting to the emergency service (ES) and Short Stay Unit (SSU) of a paediatric hospital in central Portugal.

Methods: During the 2006-2013 January-June epidemic seasons, all children <36M, attending the ES or admitted to the SSU, with AG providing a stool sample were tested for RV using immunoassay.

Results: A total of 9030 AG cases were seen and 2849 (32%) tested for RV. We observed a fall in both the overall number of AG attendances (r=-0.85 p=0.007) and RV+ cases (r=-0.65 p=0.08) (49% in 2006 and 30% in 2013). The average age of RVAG cases increased (14.1M in 2006, 16.8M in 2013) (R^2 =0.01 p=0.02). The proportion admitted to the SSU remained stable. Although there was annual variation, no progressive trend in seasonal distribution was detected.

Conclusions: Although the incidence of AG and RVAG fluctuates, there is an overall downward trend. It is interesting to note the increase in the age of cases and yet lack of change in seasonal distribution. Higher and sustained immunisation coverage seem necessary to observe the important impact on disease reported in other countries.

ESPID-0979

IMPORTED MALARIA IN CHILDREN IN MADRID: 2007-2013

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Introduction: Imported malaria is preventable disease. Children account for around 15-20% of all imported malaria cases and they have higher risk of developing severe disease.
Aim: Describe the epidemiologic, clinical and laboratory characteristics of children diagnosed of malaria in Madrid.
Methods: Retrospective case review of all children with malaria diagnosed by thin,/thick blood smear, antigen detection test and/or PCR from 2007 to 2012 in 24 hospitals in Madrid.
Results: A total of 149 episodes of malaria were reported in 147 children. Median age at diagnosis was 72 moths (IQR: 35-119), 39% were younger than 5 years old. The most common countries of origin were Guinea Ecuatorial (66), Spain (57) and Ghana (11). 45.8% (66/144) were children visiting friends and relatives (VFRs). Only 4/124 (3.2%) received adequate prophylaxis. 93% of immigrant patients came from Africa. The peak seasonal incidence was summer and winter. Plasmodium falciparum was isolated in 135/149 (90%) and it was mainly acquired in Africa. 25 children developed severe malaria according to WHO criteria. 14 (9%) children were transferred to PICU. Only one case died. Mainly differences between immigrants and VFRs were the presence of fever (98% vs 69%, $p < 0,0001$), longer fever (55 vs 26%, $p < 0,0001$), delaying in diagnosis (62 vs 37%, $p<0,001$) and thrombocytopenia (65 vs 33%, $p>0.0001$).
Conclusions: The mayority of the children have acquired the infection in Africa and half of them were VFRs. **Few children received prophylaxis. VFRs had more presence of fever, longer fever, delaying in diagnosis and thrombocytopenia than immigrants.**

ESPID-0980

HEPATITIS B: AN AUDIT OF THE INFANT IMMUNISATION PROGRAMME WITHIN A LOCAL TRUST

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Introduction & Aims

Hepatitis B (HB) infection is a serious global health concern, with 350 million individuals chronically infected worldwide and approximately 600 000 deaths per annum, largely due to chronic infection. Perinatal transmission represents the biggest risk of chronic infection accounting for 35-50% of HB carriers worldwide. HB vaccination initiated soon after birth can substantially reduce perinatal infection. The UK offers a selective immunisation policy but has suboptimal vaccine coverage, highlighting the need for ongoing monitoring of local programmes. The aim of this audit was to assess the delivery of the HB immunisation programme, including serological testing of infants at 1 year, within a local trust.

Methods

All infants born to HB positive mothers over a 6 yr period were identified retrospectively from a hospital database. This also provided information on receipt and timing of vaccinations.

Results

33 infants were identified.

	Received	Timing
HBIG	5/8 (62.5%)	Within 24hrs - 100%
1st HB Vaccine	33/33 (100%)	Within 48hrs – 31/33 (94%)
2 nd HB Vaccine	33/33 (100%)	Within 6 wks – 29/33 (87.8%)
3 rd HB Vaccine	33/33 (100%)	Within 3 mths – 25/33 (75.7%)
4th HB Vaccine	26/29 (89%)	By 15 mths – 21/29 (72.4%)

69% of infants had serology testing.

Conclusions

The local infant immunisation programme compared favourably with regional results. 'Movement out' was the main reason identified for failure to complete vaccinations and serology testing, further compounded by poor comprehension of english and highlights the need for improved systems to facilitate information sharing between regions and to families. Serology testing could be improved by 'pairing' it with 4th dose vaccination.

ESPID-0982

HOSPITALIZATIONS FOR VARICELLA IN A INFECTIOUS DISEASES REFERRAL HOSPITAL IN A TROPICAL REGION OF BRAZIL BETWEEN 1997 - 2012

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Introduction - Despite its potential severity, varicella is not a reportable disease in Brazil. Thus, epidemiological information can only be obtained through the cases hospitalized at referral hospitals for infectious diseases. Aditionally, the seasonality of varicella is still poorly known in tropical climates.
Objectives - To describe the relationships between different climatic factors and the number of hospitlizations for chickenpox in a tropical region of Brazil.
Methods - Descriptive retrospective study including patients hospitalized with varicella between 1997 to 2012 in the only referral hospital for infectious diseases in Fortaleza, northeast of Brazil, located between latitudes 3º43'02'S and 3º32'35'S. Spearman rank correlation test was performed to examine the relationship between monthly varicella hospitalizations and climatic variables.
Results - A total of 1271 patients were hospitalized, mean (range) of 84.7 (28-155) patients/year and 7.1 (2.7 – 12.7) patients/month, repectively. The number of hospitalizations due to chickenpox correlates inversely with the average monthly total rainfall (r = - 0.6900, *p = 0.0130*) and relative humidity (r = - 0.720, p = *0.0094*) and correlated directly with the average monthly maximum temperature (r = 0.9447, *p <0.0001*) and monthly mean temperature (r = 0.7146, *p = 0.009*).
Conclusions - Higher temperatures in the dry season are associated with higher number of paediatric varicella hospital admissions. Conversely, higher humidity and more rainfall, characteristic of the rainy season, were associated with fewer hospitalizations.These findings are useful for a better understanding of the pattern of varicella hospitalization in tropical settings.

ESPID-0983

EXTENDED-SPECTRUM-BLACTAMASE-PRODUCING ENTEROBACTERIACEAE IN A PAEDIATRIC HOSPITAL – INCREASE IN COMMUNITY-ACQUIRED URINARY TRACT INFECTIONS

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BACKGROUND AND AIMS: ESBL-producing bacteria are a growing problem worldwide. This study aims to evaluate trends and characterise ESBL infections.

METHODS: Rectrospective analysis of all cases of ESBL infection from 2008-2012, in a level 3 paediatric hospital. Demographic, clinical and microbiological data were analysed. Community-acquired infections were defined as patients without risk factors admitted to the ER or hospitalised for <48 hours. Colonisation was excluded.

RESULTS: 167 ESBL+ cases were identified, corresponding to 140 children. Mean age was 6Y6M (15D-19Y); 53% were female; 73% had underlying chronic disease and 18% were under immunosuppressive treatment. Risk factors were present in 76%. An increase in the number of isolates was found over the years (2008=16, 2009=10, 2010=42, 2011=38, 2012=61), as well as an increase in community-acquired ESBL (2008=0, 2009=2, 2010=13, 2011=17, 19 2012=19). Isolated bacteria were: *Escherichia coli* (51.5%; 86), *Klebsiella spp* (33.5%; 56); *Proteus vulgaris* (6%; 10); others (9%; 15). Bacteria were isolated mainly in urine (65.3%), respiratory secretions (9%), blood (7.8%, 13) and peritoneal fluid and abscesses (7.2%, 12). Diagnoses were: urinary tract infections (65.3%, 109), respiratory infections (9.6%, 16), bacteraemia (8.4%, 14), soft tissue infections (7.8%, 13), intraabdominal infections (7.2%, 12) and others (1.8%, n=3). 48 patients (70.6%) developed infection during prolonged hospitalisation (mean interval between admission and infection=39D).

CONCLUSIONS: This study shows an increase in the number of ESBL producing bacteria. Most children have underlying chronic disease and associated risk factors, however in recent years, a growing number of community-acquired infections, mainly urinary tract infections, was found.

ESPID-0984

FEBRILE SEIZURES: ASSOCIATION WITH HHV6 AND CMV INFECTION?

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Introduction: Febrile seizures (FS) in children are associated with human herpes virus 6 (HHV6) infection (10-20%) An association with cytomegalovirus (CMV) infection has not been established.

Objective: To investigate the association between HHV6 and CMV and FS in children.

Material and Methods: Observational study of children (3 months to 5 years) without known neurologic disease. Real-time polymerase chain reaction (PCR) in whole blood and serology were made for HHV6 and CMV. Demographic, clinical and laboratory characteristics were studied.

Results: We identified 22/46 (48%) children with HHV6 with median age of 19 months (min 7 - max 30) and 8/46 (17,4%) with CMV infection with 12,5 months (min 7 – max 24). Co-detection HHV6 and CMV was made in 4/46 (8,7%). Family history of FS or epilepsy and complex FS were more frequent in HHV6 infection group (31,8%vs12,5% and 25%vs12,5% respectively) but previous seizures occurred more often in the CMV group (9%vs25%). The seizure had an average duration of 6vs3 minutes in HHV6vsCMV infection. The mean value of leucocytes was 8,7x10^9/Lvs12,4x10^9/L in HHV6vsCMV group.

Conclusion: We found a significant percentage of FS associated with HHV6. The reactivation of CMV is a known fact in septic patients, but not in this kind of mild disease. CMV infection associated with FS has not been previously described. Our findings suggest a possible association in younger patients. The cause-effect relationship remains to be established.

ESPID-0985

PNEUMOCOCCAL SEROTYPE 3 IS NOT IMMUNOGENETIC IN SEVERE IMMUNOCOMPROMISED HIV-INFECTED PATIENTS

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BACKGROUND and AIM: *Streptococcus pneumoniae* is a serious co-infection in HIV-infected. We aim to study the ability of the new 13valent conjugated polysachharide pneumococcal vaccine (PCV13) to induct immunological memory in HIV-infected adults.

METHODS: One PCV13 was given to 25 HIV- infected adults aged 37-61 years (median 47yrs) on ART. 12 patients were on CDC A (Group A) and 13 on CDC B/C (Group B), 10 had CD4>500 cells/μl; all had VL <40 c/ml. Blood was collected at baseline and 28 day. IgG against pneumococcal serotypes (PS) 3, 19A, 14, 9V and 18 were quantified by ELISA**.** B memory subpopulations were characterized by flow cytometry .

RESULTS: At baseline, > 90% of patients had IgG ≥ 0.35μg/ml against PS 19A, 14, 9V and 68% and 45% for PS 18, and 3 respectively. At 1 month, geometric mean concentrations (GMC in μg/ml) increased significantly compared to baseline (PS19A p=0.05, PS18 p=0.05, PS14 p=0.04, PS9V p=0.007, PS3 p=0.05). However, Group B patients achieved lower GMCs for all PS compared to Group A (1.973 vs 3.071 p=0.04, 0.761 vs 1.494 p=0.01, 0.886 vs 3.051 p=0.001, 2.596 vs 3.787 p=0.0001 and 0.316 vs 1.364 p=0.002 for PS19A, PS18, PS9V, PS14 and PS3). Patients with CD4<500 cells/μl did not achieve the protective threshold for PS3. Phenotypic analysis results are not available yet.

CONCLUSIONS: PCV13 is safe and immunogenic in HIV-infected adults on ART although immune responses are affected by CD4 and stage of HIV. PS 3 is not immunogenic in subjects with CD4 <500 cells/μl.

ESPID-0986

OUTCOME OF COMMUNITY-ACQUIRED URINARY TRACT INFECTIONS (UTIS) CAUSED BY EXTENDED SPECTRUM-BLACTAMASE-PRODUCING ENTEROBACTERIACEAE (ESBL) IN CHILDREN

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BACKGROUND AND AIMS: Infections caused by ESBL producing Enterobacteriaceae frequently have unfavorable outcomes or long hospital stay. It was shown that inadequate antimicrobial therapy was an independent risk factor for mortality but not for UTI in adults. There are few data on the outcome of those UTIs in children. The aim of this study was to analyse treatment and outcome of ESBL+ UTIs in children.

METHODS: Retrospective review of all cases of community-aquired ESBL+UTI in a paediatric centre from 2008-2012. Only urine samples obtained by suprapubic aspiration, bladder catheterisation or clean-catch method were included. Outcome was evaluated with regard to clinical and microbiologic responses.

RESULTS: 25 cases of ESBL+UTI were diagnosed; 72% were female; median age was 3.5Y (26D-15.1Y). Thirteen children (52%) had cystitis and 12 pyelonephritis. Initial treatment was amoxicillin/clavulanate or cefuroxime, according to local protocol. All received oral treatment. Of the 25 enterobacteriaceae 19 were *E. coli* (76%). Once microbiological results were known, cases were reviewed: all children were afebrile or without genitourinary symptoms within 48h of empiric antimicrobial therapy except for a 6M old child that persisted with fever. Fifteen (60%) children had a repeat urine culture that was negative in all. In two children antimicrobials were switched despite negative urine cultures. No relapse within 4 weeks after completion of therapy was found.

CONCLUSIONS: Although the numbers are small, clinical and microbiological follow-up showed that children with ESBL-UTI were successfully treated with noncarbapenem antimicrobials.

ESPID-0988

STUDY OF SERUM SOLUBLE UROKINASE PLASMINOGEN ACTIVATOR RECEPTOR (SUPAR) AS AN INFLAMMATION MARKER IN CHILDREN WITH PNEUMONIA

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Background: Soluble urokinase plasminogen activator receptor(suPAR)is a protein derived from the cell membrane-bound urokinase plasminogen activator receptor(uPAR)which has been positively correlated with the activation level of the immune system and has been shown to help as a marker in sepsis adult patients. The aim of this study was to examine the use of this marker in children with pneumonia and its use in the differential diagnosis between bacterial and viral causes of lower respiratory infections.
Method: We measured serum levels of suPAR in children hospitalized with clinical and radiological findings of pneumonia.According to laboratory and radiological findings patients were divided into 2 groups-bacterial or viral-and samples of healthy outpatients clinic used as control group.
Results: We studied 78 children(51% males)with pneumonia(38% bacterial) and 39 control patients, age from 7 months to 13 years old.In each patient CBC,CRP,ESR,blood cultures and chest X-ray were obtained.SuPAR values were significantly higher in patients with bacterial pneumonia(mean value 4,45;median 3.84;IQR 3.32-5.29;p<0,001)or viral pneumonia(mean 4,12;median 4.06;IQR3.26-4.75;p<0,001) compared to controls(mean 2,39; median 2.10;IQR 1.84-2.30). No statistically significant differences in suPAR levels were observed between patients with bacterial and viral pneumonia(p=0,86).ROC curves analysis revealed an AUC of 0.512 for suPAR in differentiating patients with bacterial from those with viral pneumonias.
Conclusion: Our study, didn't find a statistically significant difference in the suPAR levels between viral and bacterial pneumonia;further studies are needed, using a larger sample in order to define if can be used as a marker in the distinction between viral and bacterial pneumonias.

ESPID-0989

TWO YEAR PRE-VACCINE ROTAVIRUS SENTINEL SITE EPIDEMIOLOGY IN THE UNITED KINGDOM

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Background
In July 2013, the United Kingdom added rotavirus vaccine (Rotarix GlaxoSmithKline) to the national vaccine schedule. For the last 2 years we have performed active surveillance at our regional children's hospital to establish the baseline characteristics of disease burden pre-rotavirus vaccine.

Methods
During the 2012 and 2013 rotavirus seasons (January-July), children presenting to the Emergency Department with gastroenteritis symptoms (>2 loose stools *and/or* >1 episode of forceful vomiting in the last 24 hours) had stool virology analysis (real-time PCR), severity assessment (Vesikari score) and clinical outcome recorded. Positive rotavirus samples were genotyped. Nosocomial cases were retrospectively identified as patients admitted with a non-gastroenteritis diagnosis who developed positive rotavirus samples >48h after admission.

Results
For the 2012 and 2013 seasons respectively, there were 1355 & 2192 attendances with gastroenteritis symptoms. 486 & 1279 were clinically diagnosed with gastroenteritis. Of these, 282 & 276 were admitted with a 43 & 51 hours mean length of stay. Stool samples were obtained from 35% & 30% of diarrhoeal cases, 50% and 51% were positive for rotavirus. There were 6 and 15 nosocomial rotavirus cases. Genotypes detected (2012/2013) were G1P[8](71%/39%), G3P[8](20%/16%), G9P[8](7%/32%), G4P[8](2%/3%), G2P[4](0%/2%) and G12P[8](0%/7%).
Conclusions
Rotavirus generates a significant burden on the health of our population and healthcare resources. Prior to vaccine introduction there is already large fluctuation of genotypes with no geographical or temporal pattern discernible. Against this detailed baseline our ongoing programme of surveillance will now record the impact of vaccine introduction.

Acknowledgments
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ESPID-0990

A POINT PREVALENCE SURVEY (PPS) OF PAEDIATRIC ANTIBIOTIC USE IN UK HOSPITALS

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Introduction and Aims: There is limited information on antibiotic use and dosing in paediatrics. We aim to describe antibiotic use in UK Paediatric Units participating in the PPS of the Antimicrobial Resistance and Prescribing in European Children (ARPEC) project (http://www.arpecproject.eu/).

Methods: Two one-day ARPEC-PPS were completed in September 2011 and November 2012 in 174 hospitals across 24 European countries. Data were collected on standardized forms using the ARPEC-WEBPPS program. We analysed use and dosing of antibiotic prescriptions from the 61 UK paediatric units. Underdosing was defined as >10% below the lower recommended dose in the British National Formulary for Children.

Results: Data were obtained on 1247 children; median age 2 years (IQR 0.8,8), 43% female, 39% were previously "healthy" children. The commonest reason for antibiotic prescriptions were bacterial LRTI in 431(23%), prophylaxis for medical problems (285, 15%) and sepsis (202, 11%). A total of 1835 antibiotic prescriptions were recorded, with 63% as single use. 41 different antibiotics were prescribed with co-amoxiclav 327 (18%), amoxicillin124 (7%), flucloxacillin 104 (6%) and ceftriaxone 103 (6%) the most frequently used. Meropenem and colistin were almost exclusively prescribed to children with underlying conditions. The median dose for flucloxacillin was 93mg/kg/day (IQR42,140) and 63mg/kg/day (IQR 50,80) for ceftriaxone. Underdosing was observed in >25% of flucloxacillin prescriptions.

Conclusions: A wide range of antibiotics with variable dosages are used across paediatric units within the UK. Tackling this variation requires antibiotic stewardship programmes to become part of routine practice. These should focus on appropriate dosing, as well as antibiotic usage.

ESPID-0991

INVASIVE PNEUMOCOCCAL DISEASE AFTER IMPLEMENTATION OF 13-VALENT PNEUMOCOCCAL CONJUGATE VACCINE IN ORANGE COUNTY, CALIFORNIA. FOUR YEAR INTERIM REPORT

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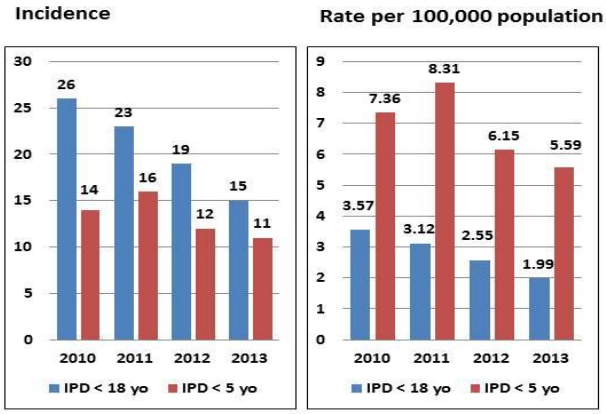
Introduction: Increase invasive pneumococcal disease (IPD) due to non-vaccine serotypes followed 7-valent pneumococcal conjugate vaccine (PCV-7); 13-valent PCV was introduced in 2010 to address associated increased resistance and virulence. We conducted a prospective surveillance study evaluating the impact of PCV-13 in children < 18 years old (yo) in Orange County, California (OC).
Objectives: Determine impact of PCV-13 on IPD in OC
Aims: Identify yearly incidence and rate/100,000 population of IPD in < 18yo and < 5yo in OC. Determine serotype, immunization/health status, clinical syndrome, antibiotic resistance and outcome of IPD subjects.
Methods: After obtaining appropriate IRB approvals, cases of IPD in < 18yo in OC were identified. Demographic, immunization/ health status were recorded. IPD isolates at our institution (CHOC) were serotyped. Other isolates were sent to a reference laboratory for serotyping when available.
Results: A 4 year surveillance identified 83 IPD (53 in < 5yo) countywide; 50 (60%) were CHOC patients. A decrease in incidence and rate was noted over the study period (Fig 1); only 3/28 IPD with PCV-13 isolates occurred in fully immunized previously health children (Table 1)

Figure 1. Countywide Incidence and Rate of Invasive Pneumococcal Disease in 2010 - 2013



There was an overall yearly decrease in incidence (42.3%) and rate (44.3%) in < 18 year olds following introduction of PCV-13; the 4 year change was less evident in < 5 year olds (decrease incidence 21.5% and rate 24.1%)

Table 1. Serotype Distribution of Pneumococcal Isolates < 18 Years Old 2010 - 2013

Serotype distribution at CHOC

	NON-PCV-13	PCV-13	
2010	5 (50%)	5 (50%)	10
2011	6 (47.5%)	10 (62%)	16
2012	6 (60%)	4 (40%)	10
2013	7 (58%)	5 (42%)	12
Total	24 (50%)	24 (50%)	48

Countywide Serotype Distribution

	NON-PCV-13	PCV-13	
2010	12 (60%)	8 (40%)	20
2011	10 (50%)	10 (50%)	20
2012	10 (67%)	5 (33%)	15
2013	8 (61%)	5 (39%)	13
Total	40 (59%)	28 (41%)	68

- **Serotype was not available for 2 (4%) subjects at CHOC and 15 (18%) countywide.**
- **Of the 28 subjects with PCV-13 isolates, 21 were previously healthy and only 3 of them had received all 4 PCV-13 doses at the time of infection; 2 had one dose , 13 had received none. Immunization status was unknown for 3 subjects.**

Conclusion: Countywide incidence and rate of IPD decreased every year after introduction of PCV-13. Only 3.6% IPD due to PCV-13 isolates occurred in healthy fully immunized children.

ESPID-0992

BACTERIAL CAUSES AND ANTIBIOGRAM OF URINARY TRACT INFECTION IN CHILDREN IN ZAWIA, LIBYA

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Introduction: Urinary tract infection (UTI) is one of the most important infections in children. Escherichia coli is a common cause of Urinary Tract Infection (UTI) affecting children both male and female worldwide, however data on the incidence and antibiogram of the various strains of bacteria including E. coli isolated from UTI samples in Libya is scanty hence this present study.

Objectives and aim: To determine the prevalence and antibiogram of bacteria causing UTIs from a referral hospital in Libya.

Methods: A cross-sectional study of mid-stream urine specimens collected from 788 patients was conducted from 2006 to 2007. Each sample was cultivated on blood agar and Mac Conkey agar and incubated at 37^{o}C for 24 hours. Bacterial isolates were identified with Gram stain and antimicrobial susceptibility tests were done using disc diffusion technique.

Results: Urine samples of the 788 patients were tested of which 123 (15.6%) were positive for bacterial growth. Seventy five (61%), 19 (15.4%), 15 (12.2%), and 12 (10%) of the bacterial isolated were *E. coli, K. pneumonia, S.aureus*, and *Enterobacter*, respectively and 2 (1.6%) showed growth of other bacteria. Most bacterial isolates showed high sensitivity to Ciprofloxacin, Amoxicillin-clavulanic acid, Nalidixic acid, Cefotaxime and Ceftriaxone with resistance to ampicillin, and Trimethoprim-sulfamethoxazole.

Conclusion: Data shown in this study concluded that in urinary tract infection in children *E. coli* is an important causative agent. Effective infection prevention measures and physician awareness and education regarding drug resistant should be implemented to reduce the prevalence of this important disorder in children.

ESPID-0993

ANTIBIOTIC PRESCRIPTION PATTERN IN 23 GERMAN PEDIATRIC HOSPITALS: RESULTS FROM A POINT PREVALENCE SURVEY

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Background and aims: As part of the Antibiotic Resistance and Prescribing in European Children (ARPEC) project, 23 German pediatric hospitals participated in a neonatal and pediatric antimicrobial point prevalence survey (PPS) in November 2012.

Methods: In November 2012, a one-day PPS on antimicrobial use in hospitalized children was performed using the standardized and validated ARPEC method. Data relating to underlying diagnosis, systemic antimicrobial agent, and indication, among others, was collected. Hospitals were grouped according to type (University hospital [UniH] vs. non-University hospital [non-UniH]) and region (Southwest, Southeast, Northeast and Northwest).

Results: In total, 320 pediatric and 101 neonatal inpatients received at least one antimicrobial agent. Overall, the antimicrobial prevalence rate (APR) was 33,1% (range 9,5-49,5%) and 21,8% (range 10,5-50,0%), respectively. In pediatric patents, APR was the same in both UniH and non-UniH, whereas in neonates, APR was higher at UniH (27,0% vs. 16,7%), due to a larger number of VLBW preterm infants. In the Northwest, APR in NICU and general pediatric ward patients was significantly higher than in the other three regions, whereas for hematology/oncology patients here, the rate was lower. The most common therapeutic indication for antimicrobials was lower respiratory tract infections (LRTI; n=44) in pediatric and catheter-related bloodstream infections (n=26) in neonatal patients. In LRTI, reserve antibiotics and combination therapy were used in 24,3% and 40,5%, respectively.

Conclusions: Hospital type and region influence antimicrobial prescription patterns. In Germany, there is urgent need for improvement in the area of high usage of combination therapies and reserve antibiotics.

ESPID-0994

MYCOPLASMA PNEUMONIAE INCIDENCE, CLINICAL AND LABORATORY FEATURES IN CHILDREN TREATED AT UNIVERSITY CHILDREN'S HOSPITAL IN LATVIA

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Background and aim:

Mycoplasma pneumoniae pneumonia (MP) has been reported in 10-40% of community-acquired pneumonia cases.
A prospective study with 77 patients treated in University Children's Hospital (UCH) in Latvia, was commenced in October, 2013. The aim is to estimate the incidence, clinical and laboratory features of MP in children.

Materials and methods:

Blood samples were collected from children with evidence of pneumonia for CBC and CRP detection by standardized methods, and „EUGENE MP IgM" rapid test – a lateral flow immunochromatographic assay for the qualitative detection of IgM antibody to M.pneumoniae.
Statistical analyses were perfomed using SPSS Statistics.

Results:

33,8% (26) of patients were positive to M. pneumonia, and 61,5% (16) of them were 3 month-5 years of age, there boys are more often affected than girls 1.9:1. Only one child with MP was SIRS positive. All patients with MP had cough, and majority of patients had fever. White blood cell count was more increased in group of patients <5 years.

Conclusions:

Children <5 years old are prone to M.pneumoniae infection as well as school-aged children. The clinical and laboratory features of MP differs with age.

This study was conducted as a part of the State research program "Scientific research with help of multidiscipline consortium of main pathologies endangering survival and quality of life of inhabitants of Latvia".

ESPID-0997

PERTUSSIS CASES IN NEONATES IN NORTHERN IRELAND IN 2013 FOLLOWING INTRODUCTION OF MATERNAL VACCINATION IN PREGNANCY

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Background 2012 saw a dramatic increase in cases of pertussis in Northern Ireland. 66 confirmed cases in 2012, were in infants less than 3 months. Vaccination of pregnant women with PT vaccine was therefore commenced in October 2012. The study's aim was to observe the effect on infant pertussis.

	Notified cases	Population est mid yr 2012	Incidence	Number of deaths in <3month old (per million pop)
Northern Ireland	399	1,823,634	0.2/1,000	1 (0.54)
England and Wales	10,369	56,567,800	0.18/1,000	14 (0.247)
USA	48,277	309,326,225	0.16/1,000	15 (0.048)

Population data from Northern Ireland, England and Wales and USA Government websites, pertussis figures PH England and Wales website, CDC website.

Methods Public health data for pertussis was reviewed from 2004. Retrospective review of maternal vaccination was performed in reported infant cases. Paediatric Intensive Care data from April 2008 to June 2013 was provided by PICAnet (audit network).

Results 3(6%) of confirmed cases in 2013 were in those less than 3 months, compared to 66 (22%) in 2012. 3 children born to mothers vaccinated in pregnancy developed pertussis in 2012, one mother received the vaccine the week of delivery, a second within 2 weeks and the third was preterm. Data is available for 2 of the 3 confirmed cases in 2013 and neither of these mothers was vaccinated. 3 neonates were admitted to PICU in 2012 with pertussis, 1 died at 4 weeks. There have been no 2013 PICU admissions.

Year	Confirmed cases	Reported cases	Incidence (per 100,000)
2004	5	28	1.6
2005	3	28	1.6
2006	3	28	1.6
2007	4	16	0.9
2008	16	30	1.7
2009	17	25	1.4
2010	13	18	1.0
2011	15	18	1.0
2012	300	399	21.8
2013	53 *	75*	

*data on 9/12/13

Age	**Antibody**		**PCR**		**Culture**		**Total**	
	2012	**2013**	**2012**	**2013**	**2012**	**2013**	**2012**	**2013**
<3/12	0	0	51	3	15	0	66	3
3-5/12	0	0	22	1	1	0	23	1
6-11/12	1	0	6	0	1	0	8	0
1-4 yrs	1	0	20	7	0	0	21	7
5-9 yrs	1	0	7	3	1	0	9	3
10-14 yrs	18	5	21	3	1	0	41	8
15-24 yrs	12	3	13	2	0	0	25	5
Over 25 yrs	60	20	47	6	0	0	107	26
Total	**93**	**28**	**187**	**25**	**19**	**0**	**300**	**53**

Conclusions Confirmed cases of pertussis in 2013 decreased 82% compared to 2012. Infants showed a 94.3% decline as opposed to 76.5% in those over 15 years. This data supports maternal vaccination in preventing infant pertussis.

ESPID-0998

THE PERSISTENCE OF MEMORY B CELLS FOLLOWING A BOOSTER DOSE OF A 13- OR 10-VALENT PNEUMOCOCCAL CONJUGATE VACCINE

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Background/Aims: In the UK, children receive the 13-valent pneumococcal conjugate vaccine (PCV-13) at 2, 4 and 12 months of age. In this randomised controlled trial we assessed non-inferiority of a 10-valent pneumococcal conjugate vaccine (PCV-10) as an alternative 12-month booster. As a descriptive secondary objective, we also assessed the memory B cell (B_{MEM}) responses to booster immunisation. We previously reported that a booster dose of PCV-13 results in a more pronounced peripheral blood B_{MEM} response than does a booster of PCV-10 at 1 month post-vaccination.

Methods: 178 children previously vaccinated with PCV-13 at 2 and 4 months were randomised 1:1 to receive a booster dose of either PCV-13 or PCV-10 at 12 months of age. Blood was taken pre-vaccination and at 1 and 12 months following booster vaccination. B_{MEM} were quantified using a cultured ELISpot assay for serotypes 1, 3, 4, 9V, 14, and 19A.

Results: Between 1 month and one year following booster vaccination, B_{MEM} frequencies in the peripheral blood declined significantly for serotypes 1, 3, 4, 9V, and 19A in the PCV-13 group and remained elevated compared to baseline values only for serotype 3. In the PCV-10 group, B_{MEM} frequencies for serotype 14 and 19A were higher compared to baseline. No significant differences in B_{MEM} frequencies were observed between the groups.

Conclusions: One year post-booster vaccination, B_{MEM} frequencies were back to baseline values for most serotypes suggesting that the peripheral blood is not the optimal compartment to follow vaccine-induced B_{MEM} in the long term.

ESPID-0999

GRAM NEGATIVE INFECTIONS IN CHILDREN WITH FEBRILE NEUTROPENIA: MONOTHERAPY OR COMBINATION?

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Backgrounds and aims: Children with febrile neutropenia (FN) are at increased risk of severe bloodstream infection and empirical treatment targeting Gram negative must be effective as sepsis (BSI) due to these organisms can be rapidly fatal. We report antibiotic resistance of Gram-negative isolated in children with FN (cancer and HSCT) in single Hospital in Italy for the period 2001-2013.

Methods: During study years each episode of FN with positive BC has been recorded with isolate type and resistance, cancer status and cancer type, presence of CVC and outcome.

Results: A total of 257 Gram-negative bacteremia were diagnoses: 233 single agent and 24 polymicrobial. A total 17 patients died within 2 weeks after diagnosis of bacteremia: 14 in neutropenic patients and 3 in polymicrobial infections.

When the presence of concomitant resistance was analyzed, 10/161 (6%) tested strains resulted simultaneously resistant to piperacillin tazobactam+amikacin , 13/255 (5%) to meropenem + amikacin, 14/254 (5%) to ceftazidime + amikacin.

Conclusions: The patterns of considerable resistance of Gram negative infections suggest a clinical issue when deciding the antibiotic regimen in febrile neutropenic children.

We suggest to reserve adding of a second Gram-negative agent or glycopeptide for patients who are clinically unstable, when a resistant infection is suspected, or for centers with a high rate of resistant pathogens. Coverage should include Gram-negative organisms in all patients as well as viridans group streptococci and Pseudomonas aeruginosa in high-risk FN.

Tab.1 Number of isolated strains for each single pathogen.

Pathogen		# of isolated strains
Enterobacteriaceae (131 strains)	E.coli	76
	Klebsiella pneumoniae	24
	Other klebsielle	11
	Serratia sp	3
	Enterobacter sp + cloaceae	17
Pseudomonadaceae (86 strains)	P.aeruginosa	53
	Other Pseudomonadaceae	33
	S.maltophilia	9
	B.cepacia	2
	R.pickettii	2

Table 2 Resistance to selected antibacterial of Gram-negatives isolated from blood cultures in children with cancer

	Ceftazidime	**Piperacillin-tazobactam**	**Meropenem**	**Amikacin**	**Ciprofloxacin**
	Resistant/tested (%)	Resistant/tested (%)	Resistant/tested (%)	Resistant/tested (%)	Resistant/tested (%)
Enterobacteriaceae	**33/131 (25%)**	**39/93 (42%)**	**4/130 (3%)**	**9/130 (7%)**	**28/130 (21%)**
e.coli	13/76 (17%)	19/57 (33%)	0/75 (0%)	5/76 (7%)	17/75 (23%)
k.pneumoniae	11/24 (46%)	13/18 (72%)	4/24 (17%)	4/24 (17%)	6/24 (25%)
Other enterobacteriaceae	9/31 (29%)	7/18 (39%)	0/31 (0%)	0/30 (0%)	5/31 (16%)
Pseudomonadaceae	**16/84 (19%)**	**3/50 (6%)**	**20/84 (24%)**	**12/83 (14%)**	**9/84 (11%)**
p.aeruginosa	7/53 (13%)	2/35 (6%)	7/53 (13%)	0/52 (0%)	4/53 (7%)
Other pseudomonadaceae	9/31 (29%)	1/15 (7%)	13/31 (42%)	12/31 (39%)	5/31 (16%)
Total	58/253 (23%)	44/164 (27%)	30/258 (12%)	34/256 (13%)	45/259 (17%)

ESPID-1000

TWO SIBLINGS WITH HYPER IGE SYNDROME PRESENTING WITH MOLLOSCUM CONTAGIOSUM INFECTION AND RECURRENT PNEUMONIA

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Introduction: Moloscum contagiosum (MC) is a pox virus infection characterised by gradually increased multiple pearly white raised skin lesions. MC can be seen in hyper IgE syndrome which is a pimary immun deficiency syndrome chacterized by eczema, recurrent sinopulmonary infection and increased serum IgE levels. **Cases:** Two siblings at the age 9 and 3 were referred to our clinic for recurrent pulmonary infection. Cutaneous examination revealed multiple pearly white papules and nodules with central umbilication. Oldest sibling had clubbing. On further workup, immunoglobulin levels showed normal IgG, IgA, IgM, and lymphocyte subgroups but serum IgE levels were highly elevated (2779 IU, 530 IU/ml respectively). MC was diagnosed via skin biopsy. Extraction with curettage was done for molluscum lesions. Thorax computerised tomography established bilateral infiltrations with cavitary lesions in the oldest sibling. **Conclusion:** MC and chronic pulmonary infiltrations are seen in hyper IgE syndrome. Our cases were presented due to its rarity.

ESPID-1002

MANAGEMENT OF CLOSE CONTACTS OF PATIENTS WITH INVASIVE STREPTOCOCCUS PYOGENES INFECTION

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Introduction. Invasive infections due to Streptococcus pyogenes (Group A Streptococcus - GAS) have been increasing in incidence and severity in recent years. Although the risk of secondary cases among close contacts of an index case remains uncertain, the currently available evidence does not justify the routine administration of antibiotic prophylaxis to all of them.

Objectives. We aim to propose an approach based on pharyngeal culture testing of contacts and targeted antibiotic prophylaxis.

Methods. A large throat swab survey of 105 individuals considered close contacts (including households, family casual contacts, school contacts and healthcare workers) has been undertaken after a fulminant and fatal case of GAS necrotizing fasciitis of a 7 years old child. Streptococcal strains were characterized by emm-typing and antimicrobial susceptibility to seven antibiotics. The presence of 30 virulence determinants was performed by PCR and sequencing.

Results. The isolate recovered from the index case was a multi susceptible M1T1 GAS clone. The same strain was present in the throat of 36% of close contacts who have had more than 24 hours per week exposure to the index case (family households and classroom contacts) while the same strain was only present in 2% of any other contact.

Conclusions. This study describes a practical approach including educational campaign, microbiological characterization and targeted antibiotic treatment for close contacts after a fatal case of necrotizing fasciitis due to GAS.

ESPID-1006

DIFFERENT CLINICAL OUTCOME OF ENTEROVIRAL MYOCARDITIS IN TWINS.

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Enteroviruses are a common cause of neonatal infections. Enteroviral infections in neonates, although mostly asymptomatic or self-limiting, show many different clinical expressions, and can lead to severe diseases such as sepsis, meningoencephalitis, hepatitis and myocarditis.

We report the cases of twin-brothers born at 35 weeks gestation. Both developed an enteroviral infection with a very different clinical course.

The first twin developed a sepsis-like syndrome on day 7 with tachycardia, lethargy, palor and tachypnea. Viral and bacteriological cards were performed and broad-spectrum antibiotics and aciclovir were started. A few hours later he developed a hepatomegaly, progressive hypotension and desaturations. Echocardiography showed severe myocardial dysfunction. Inotropic support was initiated, as well as intravenous immunoglobulins (IVIG) but the patient deteriorated and died after 18 days of extracorporeal membrane oxygenation. Polymerase-chain reaction (PCR) showed the presence of enterovirus in cerebrospinal fluid and in the blood.

His brother presented with episodic supraventricular extrasystoles on day 6, initially well tolerated but with progressive emergence of cardiac failure. Blood PCR was also positive for enterovirus. He was treated with IVIG and amiodarone. His clinical progress was marked by an amiodarone intoxication leading to cardiogenic choc complicated by a necrotizing enterocolitis leading to surgical intervention and acute renal failure requiring dialysis. He recovered and left the hospital on day 39.

Viral myocarditis may occur as an isolated finding or combined with other organ involvement. This report reminds us that neonatal enteroviral infection may vary in clinical presentation and progress even within twins.

ESPID-1007

PROGRESS IN THE PREVENTION OF THE HIV TRANSMISSION FROM MOTHER-TO-CHILD ASOCIATED TO A HIV TRAINING PROGRAM IN BATA, EQUATORIAL GUINEA

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BACKGROUND

Since 2010 an HIV training program has been supported and developed by the National Centre of Tropical Medicine, Institute of Health Carlos III, Spain (NCTP) to strengthen local clinician skills in PMTCT in Equatorial Guinea (EG). The aim of this study was to describe temporal patterns in the management of HIV-infected mothers and their infants in Bata, EQ.

METHODS

A prospective observational study was performed in Regional Hospital of Bata and 'Maria-Rafols' Primary Care Center, Bata, EQ. HIV-1 exposed infants were followed up until 18 months-old. Cohort period 1 (CP1) included births from January 2009 to June 2011. Cohort period 2 (CP2) included births from June 2011 to March 2012.

RESULTS

205 HIV-infected women and their infants were included, 103 were in the CP1. An increased use of antiretroviral prophylaxis in HIV infected women (52.4% vs. 69.6%, p= 0.01) from CP1 to CP2 was observed. Fourteen children (13.6%) were diagnosed of HIV-1 infection or presumptive HIV diagnosis in CP1 versus four children (4%) in CP2. Seven children (6.8%) died in CP1 and 3 children (3%) in CP2. A high rate of children lost to follow up were observed all over the time (48.5% in CP1 vs. 41.1% in CP2, p NS)

CONCLUSIONS

An increased access to antiretroviral prophylaxis in women and infants had been assessed in association to an effort in training and clinical assessment program. However the high rates of children lost to follow up did not allow finding out the real impact for preventing HIV transmission.

ESPID-1008

HERPES SIMPLEX ENCEPHALITIS AND MALIGNANT NEUROLEPTIC SYNDROME IN A 14 YEAR OLD GIRL WITH RECURRENT HSV-1 CONJUNCTIVITIS

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Background:

Herpes simplex encephalitis is a rare and potentially fatal manifestation of primary or recurrent herpes simplex virus-1 (HSV-1) infection and also malignant neuroleptic syndrome rarely occurs in children as neuroleptics are hardly administered to children.

Case report:

A 14 year old girl with a history of HSV-1 conjunctivitis presented to our hospital with a one day history of slurred speech, laryngeal spasms, facial- and lingual myoclonia. Four weeks ago she was treated with oral acyclovir due to a recurrent left sided HSV-1 conjunctivitis and later developed a febrile bacterial tonsillitis that was treated with cephalosporin. CSF analysis demonstrated 157 cells/l and a positive HSV-1 PCR. Repeated EEGs showed abnormal slow waves over the right hemisphere and temporal epileptiform dicharges, MRI scans demonstrated abnormal FLAIR and diffusion signals of the right anterior temporal lobe. Immediate treatment with i.v. acyclovir was started and subsequently extended for foscarnet and dexamethasone as the viral load rose and the MRI changes spread. Convulsions progressed to a partial status epilepticus and consciousness remained impaired. In a state of agitation she received haloperidol and afterwards developed shivering, rigor and a rapid rise in temperature. The malignant neuroleptic syndrome was treated with cooling, dantrolene and bromocriptine and the patient finally recovered with only minor neurological residuals. The workup for underlying immunodeficiency remained unremarkable.

Conclusion:

Herpes simplex encephalitis and adverse reactions to uncommon drugs need to be considered as immediate treatment is crucial.

ESPID-1009

WHAT ITALIAN PHYSICIANS THINK ABOUT ROTAVIRUS VACCINATION

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INTRODUCTION
Rotavirus vaccination(RVV) is effective in preventing severe Rotavirus infections and hospital admissions for Rotavirus gastroenteritis and it's cost-effective in western countries. In Italy the vaccination coverage is low and few regions include RVV in their immunization schedule, offering it in coypament or as free of charge, mainly to specific target groups.
AIMS
We wanted to know the opinion about RVV of Italian primary care pediatricians (PPP) and physicians of vaccination clinics (VCP)
METHOD
A closed questions questionnaire was administered to a sample of PPP and VCP before to start a residential course about immunization counselling. The data were collected during eleven courses in different Italian regions, throughout 2013.
RESULT
230 physician were included, with 102 PPP and 128 VCP. Only 18% of physicians routinely recommended RVV. The 51% used to talk about this vaccine to parents and the 24% offered them divulgative material about RVV. The 53% had received the main information about RVV by drug manufactures. According to these physician the most important measures to improve vaccination coverage would be offering RVV free of charge, then incrementing their personal knownledge of RVV and immunization counselling skills.
CONCLUSIONS
Our survey show that there is a poor awareness of the importance of RVV among Italian PPP and VCP. Including RVV in regional immunization schedules as free of charge or in coypament and, simultaneously, incrementing the knowledge of the vaccine among Italian pediatricians and vaccinating physicians could increase the vaccination coverage, probably resulting in a cost-effective measure.

ESPID-1010

CYTOMEGALOVIRUS INFECTION IN AN INFANT WITH VENTRICULOMEGALY. IS IT CONGENITAL OR POSTNATAL?

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Introduction: Differential diagnosis between congenital and postnatal cytomegalovirus (CMV) infection may be challenging and essential for follow-up.
Aims: We describe a case of CMV infection that illustrates the difficulty of correct diagnosis.
Methods: Data from patient's hospital file.
Results: A six-week old male infant presenting irritability and progressive feeding difficulties since third week was admitted for splenomegaly, anemia, lymphomonocytosis and thrombocytopenia. Acute CMV infection was diagnosed [IgG+ (240 UA/mL)/IgM+ (1,03), polymerase chain reaction (PCR) positive in urine and blood, negative in cerebrospinal fluid; viral load 535 copies/mL]. Could be congenital infection due to ventriculomegaly detected at 25 weeks of gestation and periventricular calcifications suspected by ultrasound and brain MRI, but calcifications weren't confirmed by CT scan. In favor to postnatal infection we had maternal antibodies for CMV IgG>250 UA/mL, IgM negative, also during second trimester of pregnancy, a newborn assymptomatic at birth and breastfed for the first two weeks, clinical improvement during hospitalization, IgG titers inferior to mother's, IgM and viral load negative at discharge. No treatment was administered.
PCR for CMV-DNA in Guthrie card was negative (known after discharge).
Followed at hospital consultations, he's neurologically well with six months old, besides macrocephaly and mild axial hypotonia.
Conclusion: Though some findings were prone to congenital infection, as ventriculomegaly, postnatal infection was supported by CMV maternal serology during pregnancy, no symptoms at birth, breastfeeding, positive PCR for CMV, increased titers of IgM subsequently negative and similar mother/infant CMV IgG ratio. Lately, the diagnosis was confirmed by PCR in Guthrie card.

ESPID-1011

THE MEASLES OUTBREAK IN A ROMANIAN ROMA CAMP IN POLAND WITH A CASE OF INTRAUTERINE MEASLES VIRUS (MV) INFECTION

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The measles immunization coverage rates remain high in Poland (in 2010 98% for the first dose, and 97% for the second dose). Nevertheless outbreaks in unvaccinated Roma communities were observed in last years.

The aim of the study was to present a measles outbreak with a case of intrauterine infection in a newborn.

Material and methods: 15 children aged from 4 days to 16 years with measles were admitted to Pediatric Infectious Diseases Department in Wroclaw between May and September 2012. The index case was the 3-year-old girl, who arrived from Romania to visit her family and stayed in the Roma camp in Wroclaw. Nine of the cases (60%) were classified as confirmed and 6 (40%) as probable cases according to the EU 2008 case definition. Importation of measles was confirmed by the detection of measles virus Wroclaw.POL/22.12/1-6 which was identical as variant “D4-Maramures” circulating in Romania since 2011 to 2012. The clinical course of measles was typical without any serious complications. One 16-year-old young mother developed measles on the 3rd day after delivery. The intravenous immunoglobulin was given to her newborn. The newborn had no measles symptoms except mild fever but we detected the excretion of measles virus in urine samples collected on the three consecutive days.

Conclusion: Our outbreak experience highlights the still existing problem of immunity gaps associated with Roma groups moving throughout Europe. Immunoglobulin treatment prevents the development of the symptoms of measles but has no influence on the virus excretion in urine.

ESPID-1012

WHAT WE KNOW ABOUT ANTIBIOTICS

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Background & Aim: Antibiotics are commonly prescribed by doctors regardless of speciality and experience. Imparting and continuously evaluating the antibiotic knowledge of Medical Students (MS) and Doctors is essential for good antibiotic stewardship. We aimed to simultaneously educate and evaluate MS and Paediatric Doctors in this regard.

Methods: A 14 question quiz related to antibiotic use was designed(7 Multiple Choice Questions (MCQs), 7 True/False(T/F)) and presented in a timed powerpoint quiz to participants who filled in answer sheets. Questions topics included class recognition, administration mode, empiric prescribing, and drug monitoring requirements. Participants included final year MS during their Paediatric Module (2 quizzes), and one in each of the two Paediatric Hospitals in Dublin during a weekly educational event.

Results: 99 participants; 64 MS, 29 Doctors, 3 Pharmacists. In general Doctors performed better than MS. Registrars scored higher than Consultants and SHOs. Scores for individual question varied from a low of 15% to 98%. Major deficiencies were identified – only 15% were correct in identifiying GAS as penicillin susceptible and around third correctly answered MEQs about gentamicin, antiretrovirals and empiric therapy (35%,32%,30%). Best scores were achieved in T/F category pertaining to side effects and antibiotic classes.

Conclusions: There is a lot we don't know about antibiotics.

More education is needed, but focused on: actual knowledge deficiencies, relevant and practical knowledge and antibiotic stewardship.

Brief interventions such as this provide a fun learning experience and can be readily incorporated into scheduled hospital activities.

Higher staff levels must also be targeted in these activities.

ESPID-1013

PEDIATRIC URINARY TRACT INFECTION: LOCAL RESISTANCE PATTERNS AND EMPIRICAL ANTIBIOTIC SELECTION

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Background and aims: Empirical antibiotic selection and internal protocols should be based on knowledge of the local prevalence of bacterial organisms and antibiotic sensitivities. The aim of this study was to assess the most appropriate antibiotic as empiric treatment of urinary tract infection (UTI) in our pediatric population according to local resistance patterns of uropathogens.

Methods: A retrospective analysis of isolated microorganisms from urine cultures in our hospital and their antibiotic susceptibility was undertaken for a period of one year (January to December 2013), regarding patients below the age of 18 years.

Results: 403 urine cultures corresponding to 313 patients (60,3% female) were analyzed. The median age was 3 years. Gender distribution was found to be predominantly male in the first year of life and subsequent reversal of this distribution. The most common agent was Escherichia coli (E.Coli) corresponding to 61,8% of cases followed by Proteus mirabilis (21,1%), Staphylococcus saprophyticus (3,7%) and Klebsiella pneumoniae (2,5%). It was respectively assessed the overall and E.Coli resistance to ampicillin (41,6%;45,8%), amoxicillin/clavulanate (5,6%;4,8%), cefuroxime (3,6%;2,5%), ceftazidime (2,2%;2,4%) and gentamicin (3%;2,8%). No statistical difference between amoxicillin/clavulanate and cefuroxime resistance pattern was verified ($p>0,05$). Resistance to cotrimoxazole and nitrofurantoin, used in chemoprophylaxis, was relatively high.

Conclusions: In our hospital, as in other hospitals of Portugal, cefuroxime was the first-line empiric treatment of pediatric UTI, regarding a similar study in 2007. Since amoxicillin/clavulanate local resistance pattern decreased and its similar to cefuroxime, it can now be considered as first option, which is consistent with national guidelines.

ESPID-1014

POSTSURGICAL MEDIASTINITIS IN AN ITALIAN THIRD-LEVEL PEDIATRIC HOSPITAL: RISK FACTORS, MICROBIOLOGICAL FEATURES AND CLINICAL MANAGEMENT

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Backgound and aims: Mediastinitis is a significant source of poststernotomy morbidity and mortality. We describe clinical features and management of a pediatric cohort of patients referred to our cardiac surgery with postsurgical mediastinitis.

Methods**:** retrospective collection of data from health record for the period January 2012-October 2013

Results: We identified 25 cases. All the patients had congenital heart disease, median age 11 months (14 days - 25 years), 18 males and 7 females. The main risk factors were: male gender (72%), age <1 year old (52%), underlying syndromic disease (16%), extracorporeal circulation time >105 minutes (60%). Median latency between surgery and clinical onset (fever and/or wound dehiscence) was 7 days (2-73 days). Systemic antibiotic therapy was initiated in all patients, excepted three, within 72 hours from the onset. Surgical mediastinal revision was performed in all patients, with a median latency from symptoms onset of 6 days (0-14 days). 48% had at least one positive blood culture. Gram-positive bacteria were involved in 58% of patients, Gram-negative bacteria in 21%, Candida in 8.5%, Polymicrobial in 12.5% cases. Among Gram-positive pathogens, we isolated: *Staphylococcus Aureus* in 44.5% of cases (43% oxacillin-resistant); Coagulase-negative Staphylococci in 50% (88,8% oxacillin-resistant); anaerobes in 5.5%. Within Gram-negative bacterias we isolated no ESBL strains.

All patients were treated with combined antibiotic therapy, for a median of 26 days (14-82 days). There were no recurrences or deaths attributable to the infectious disease.

Conclusions: early diagnosis and timely combined medical and surgical treatment can minimize morbidity and mortality of postsurgical mediastinitis.

ESPID-1015

SUCCESSFUL ANTIBIOTIC TREATMENT OF MENINGITIS AFTER PLACEMENT OF A BRAINSTEM AUDITORY IMPLANT IN A CHILD

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Introduction: Brainstem auditory implants (BAI) have been recently used in children with sensorineural hearing impairment, due to injury or congenital malformations. Cochlear implant recipients have a higher rate of postimplantation bacterial meningitis, whereas little data exist regarding BAIs. Postoperative infection is a serious complication, since the cost of replacing the implant is remarkably high (60000 euro).
Objective and aim: We describe the case of a girl with postimplantation meningitis and infection of the auditory implant with coagulase negative staphylococcus (CNS).
Methods: A 6-year old girl presented with fever and somnolence. A brainstem auditory implant was put 9 days before, due to sensorineural hearing loss secondary to bilateral inner ear malformation. Clinical examination revealed neck stiffness and pus collection behind the ear. Lumbar puncture showed 11.200 leukocytes/mm^3(95% neutrophils), total protein of 80 mg/dL, glucose level of <10 mg/dl; Gram positive bacteria were seen on the Gram stain. CNS was isolated from the collection behind the ear.
Results: The diagnosis of meningitis and possible implant infection was made. The patient initially received treatment with cefotaxime and teicoplanin. Fever relapsed after 9 days and she had an allergic rash. She received a 10-days course of linezolid IV, followed by linezolid PO for 9 days and moxifloxacine for 15 days. Remission of symptoms was achieved. No relapse was reported during the follow-up for the last 8 months.
Conlusions: To our knowledge, this is the first case of CNS infection following a BAI implantation. Appropriate treatment resulted in cure and preservation of the implant.

ESPID-1016

MYCOPLASMA PNEUMONIAE INFECTION – DIFFERENCES IN RADIOLOGIC PATTERN

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Background and aims: *Mycoplasma pneumoniae* is a frequent pathogen of community-acquired pneumonia in children and adolescents. Clinical manifestations and physical abnormalities do not allow to firmly distinguish this agent and furthermore the radiographic findings diverge substantially. The aim of this study was to characterize the most frequent pattern of chest X-ray in patients with *M. pneumoniae* respiratory infection.

Methods: We retrospectively identified children and adolescents who presented to the emergency department of a general hospital over a five and a half year period (January 2008- June 2013) with respiratory symptoms and serologic evidence of *M. pneumoniae* from whom a chest X-ray was obtained. Demographic and clinical data were analyzed and radiographic findings were described by two radiologists.

Results: We identified 51 cases (50 patients) with a median age of 5 years (1-14). Chest X-ray was abnormal in 36 patients and the most frequent radiographic pattern was unilobar focal reticular/reticulonodular pattern (21). Findings were more often localized in the inferior lobe (30) and in the right side (22), particularly in children <5 years (16/20 vs. 6/16, p=0,009). Pleural effusion was found in 10 patients and was more frequent in children >=5 years (8/16 vs. 2/20, p=0,011).

Conclusions: Our findings are consistent with other studies which suggest that, in addition to clinical findings, respiratory infection by *M. pneumoniae* should be considered whenever there is a reticular/reticulonodular opacification confined to one lobe, particularly when it involves the inferior lobe and the right side. Differences between preschool and older children can exist.

ESPID-1017

CLINICAL UTILITY OF ROUTINE FOLLOW UP OF HIV EXPOSED UNINFECTED CHILDREN BEYOND DOCUMENTED SEROREVERSION

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Background:

Long-term monitoring of HIV & ARV exposed uninfected infants is important within the research setting however the practical benefit within a busy clinical setting is uncertain. Current we aim to monitor these children with 7 scheduled appointments, including developmental screening, from 6 weeks to 5 years.

Aims:

To determine benefit of extended follow up at the specialist ID clinic.

Methods:

Retrospective chart review of HIV exposed children, born in 2006, attending OLCHC and scheduled to complete follow up in 2011. Laboratory data extracted from the hospital's laboratory system.

Results:

46 children identified. All mothers received antenatal ARVs. All infants had negative HIV PCR tests and 41 (89%) tested antibody negative at 18 months. 31 children (67%) were subsequently lost to follow up, ie. did not complete the 7th clinic appointment, only 10 (22%) attended all appointments. Developmental screening (complete or incomplete) was documented in less than 80% of clinic visits. 15 children were referred to 24 other services, only 4 referred after 18 months of age.

Conclusions:

Attendance to 18 months was excellent, beyond which it was poor. Documentation of neurodevelopmental assessments was inconsistent and incomplete. Utilization of formal checklists in clinic could improve this. Marginal documented benefit was conferred through continued attendance at a specialist ID clinic beyond 18 months. An alternate strategy of discharge to paediatric primary care providers with open access to the ID clinic could lead to more effective utilisation of specialist clinic resources without compromising patient benefit.

ESPID-1018

FIVE CASES OF 19A BREAKTHROUGH DISEASE OCCURRING JANUARY-JUNE 2013, IN CHILDREN VACCINATED WITH THREE 13-VALENT PNEUMOCOCCAL CONJUGATE DOSES IN QUEENSLAND, AUSTRALIA

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Background and aims

Thirteen-valent pneumococcal vaccine (13vPCV) replaced 7-valent pneumococcal vaccine in Queensland, Australia in July 2011. As part of the publicly funded National immunisation Program, children receive 3-doses of 13vPCV at 2, 4 and 6-months of age. A fourth booster dose of vaccine is only recommended for children in high-risk populations.

Five cases of 13vPCV vaccine-type (mostly serotype 19A) invasive pneumococcal disease (IPD) were notified to the Queensland Health Department in January-June 2013 among children vaccinated with 3 doses of 13vPCV. In Queensland the annual birth cohort is approximately 61,000 and 3-dose 13vPCV coverage among age-eligible children is >90%. Following concern about the effectiveness of 3-dose 13vPCV against serotype 19A, we investigated characteristics of all five cases.

Methods

Queensland IPD notification, enhanced surveillance and vaccination registers were linked to identify cases of 19A IPD breakthrough disease among children who received 3-doses of 13vPCV.

Results

Five (3 males) cases of 19A IPD occurred among children vaccinated with 3 x 13vPCV doses <12-months of age. Median age of onset was 16-months (range 15-23 months). Three had bacteraemia, one had pneumonia, and one was not described. No cases died. The only risk factors identified were mild prematurity in two cases, born at 33 and 35-weeks of age respectively, and childcare attendance among all five children. The cases were not related epidemiologically.

Conclusions

The incidence of 19A breakthrough IPD in children receiving 3 doses of 13vPCV warrants ongoing surveillance. If sustained, an alternate 13vPCV vaccination schedule may need considering.

ESPID-1019

EPIDEMIOLOGY OF HOSPITALIZATIONS DUE TO WHOOPING COUGH AND BORDETELLA PERTUSSIS IN CHILDREN UP TO 12 MONTHS OF AGE IN SPAIN (1997-2011)

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Background and Aims: This epidemiological survey was undertaken to estimate the burden of whooping cough and *Bordetella pertussis* in children up to 12 months of age in Spain during a fifteen year period (1997-2011).

Methods: Retrospective survey by reviewing data of the National Surveillance System for Hospital Data including more than 98% of Spanish hospitals. All hospitalizations due to whooping cough and *Bordetella pertussis* for children under 12 months, reported during 1997-2011 period, were analysed. Codes were selected by using the 9th International Classification of Diseases codes: ICD-9-CM 033.0-033.9 and 484.3.

Results: A total of 8034 hospital discharges for whooping cough all-causes and 1939 for specifically diagnosed *Bordetella pertussis* in children under 12 months were reported during the study period. The annual hospitalization rate was 140.02 and 33.98 cases per 100,000 children, respectively. Seventy-two percent of the cases of whooping cough and 75% of the cases due to *B. pertussis* occurred before 3 months of age. A total of 41 deaths- 26 for *B.pertussis* -were reported during the period of study. All of them occurred in infants under 3 months. Hospitalization rate in 2011 increased three-fold comparing to the previous years.The average days of hospitalization was 8.25 per event. The average cost per inpatient hospital care for the study period was 2,286.5 per hospitalization.

Conclusions: Whooping cough infections concentrate in children up to 12 months in Spain. Public health measures as vaccination of care takers, health care professionals and relatives, especially young parents, are required to reduce the hospitalization burden.

ESPID-1020

Q FEVER OSTEOMYELITIS: A RARE DIAGNOSIS

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Introduction

Coxiella burnetti is a zoonotic agent acquired by aerosolized particules or ingestion of unpasteurized dairy products. Chronic Q fever is one of its clinical spectrums. In this group the osteoarticular infections are rarely seen in children.

Case Report

A 5-year-old caucasian girl, living in a rural area, with history of direct contact with cats, indirect contact with cattle, presented to the emergency department with a one-week history of left superior limb pain followed by parasternal left swelling. The radiogram was unconclusive and MRI revealed a 4 centimeter hemorrhagic and partially necrotic mass on the manubrium and first costal cartilage. The complete blood count and C-reactive protein were normal, and erythrocyte sedimentation rate was raised (40 mm/h). The histopathology revealed a chronic necrotizing granulomatous inflammatory process. Further evaluation excluded *Mycobacteria, Bartonella, Brucella* and *Francisella* infection. Chronic Q fever was diagnosed by the presence of antibody titers of anti-*C. burnetti* phase I IgG of 25600, IgA of 200 and *C. burnetti* DNA amplification in bone biopsy. Blood sample PCR was negative.

Antimicrobial therapy with rifampin and ciprofloxacin was started. At 7-month follow up, there was a progressive clinic, imagiologic and serological improvement (phase I IgG=6400 and IgA=50 in last IFA evaluation).

Conclusions

Q fever osteomyelitis, although rare in children, is probably underdiagnosed. A history of contact with cattle and granulomatous bone lesion should alert pediatricians to this entity. The choice of antimicrobial treatment is difficult regarding limited data available. Duration of therapy must be guided by clinical and serological responses.

ESPID-1021

LIPSTIC: LIVERPOOL PHARMACOKINETIC (PK) STUDY OF TEICOPLANIN IN CHILDREN

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Background: Glycopeptides are widely used to treat Gram positive organisms. Little is known about the pharmacokinetics (PK) of teicoplanin in children. There is considerable uncertainty about optimal regimens for pediatric patients.

Aim: To assess the population PK of teicoplanin and further define the optimal regimen for infants and children.

Methods: Fifty patients were enrolled into a clinical PK study. Blood samples were obtained at first and last dose intervals (1, 3, 6 and 24 hours post dose). Teicoplanin serum levels were determined with the QMS® immunoassay. A standard two-compartment population PK model was developed using Pmetrics® v1.1.4.The data were weighted by the inverse of the estimated assay variance. The fit of the model to the data was assessed with the log likelihood value, and a regression of observed-*vs*-predicted values before and after the Bayesian step.

Results: A total of 297 PK samples were collected (mean 5.94 samples). Mean drug concentration was 23.05µg/mL (SD 15.72,range 1.28-123.7).Twenty-two participants (44%) had at least one trough level <10µg/mL. Population parameters were:

	Mean	Median	SD
Clearance (L/h)	0.32	0.16	0.3
Volume of distribution central compartment (L)	3.94	2.35	4.3
Kcp	2.16	0.36	4.2
Kpc	1.66	0.23	5.4

A linear regression relationship of observed-*vs*-predicted Bayesian posterior values was given by: Predicted=0.893xObserved+1.14, r^2= 0.791.

Conclusions:

1.This study highlights the variability of teicoplanin PK in pediatric patients. Forty-four percent of patients had trough concentrations <10µg/mL, which may lead to suboptimal therapeutic outcomes**.**

2.The population pharmacokinetic model will enable the development of optimal pediatric teicoplanin regimens.

ESPID-1022

COMPARING RATE OF GROUP A STREPTOCOCCAL PHARYNGITIS RECURRENCE IN PATIENTS TREATED WITH FOUR DIFFERENT ANTIBIOTICS

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INTRODUCTION: Current guidelines recommend penicillin or amoxicillin as the first line agent in treatment of Group A Streptococcal Pharyngitis (GASP) because of its proven efficacy, safety, narrow spectrum, and low cost. It is well known that a small percentage of patients will have a recurrence of the disease a short time after completion of 10-day course of antimicrobial therapy.
OBJECTIVE: to compare rate of GASP recurrence according to used antimicrobial agent
METHOD: It was a retrospective study of 165 patients aged over 2 years presented in our private pediatric practice with symptoms suggestive of GASP, in whom rapid strep test yielded positive results. They received 10-day therapy with one of 4 antibiotics: phenoxymethylpenicillin, amoxicillin/clavullanat, cephixim, or cephadroxil. We compared rate of recurrence within 15 days after completion of the therapy.
RESULTS--During the period of the study 382 patients presented with symptoms suggesting streptococcal pharyngitis; 165 of them had positive rapid strep-test. Twenty nine were treated with phenoxymethylpenicillin, 40 with amoxicillin/clavullanat, 35 with cephixim and 61 with cephadroxil. No significant difference was observed in the clinical response to therapy after first two days ($p>0.05$). A significant difference in the recurrence of disease was found within 15 days after completion of the therapy (3 (10,3%) v 8 (20%) v 1 (2,9%) v 3 (4,9%) ; $p=0.035$).
CONCLUSIONS--These findings suggest that antibiotic treatment of of GASP with cephalosporin is more effective than with penicillin.

ESPID-1024

HANTAVIRUS INFECTION IN FRENCH CHILDREN

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Introduction : Hantavirus infections are zoonosis transmitted by rodents. These viruses cause in Europe hemorrhagic fever with renal syndrome. This infection is usually an adult infection, and only few peadiatrics studies have been published.
Aims : Study epidemiologic data in hantavirus infection in children cohort.
Methods : It is a retrospective observational study. French patients with a positive serology (1st january 2003 to 31 december 2012), and aged under 18 years old are included. The serology results are confirmed by the french reference center for hantavirus (Lyon).
Results : Twenty-four children are included. The sex ratio is 2/1. Median age is 16 years and 7 months old (8 to 17 years old and 11 months). The cases are distributed only in north and east of France.
The main clinical symptoms are nausea and vomiting (79%), fever (75%), abdominal pain (62%) and headache (58%). The first biological symptoms are renal failure (median level of creatinine 126µmol/L (62-1048µmol/L)), thrombopenia (median level 77 G/L (34-260 G/L)) and moderated elevation of C Reactive Protein (median 36 mg/L (8,7-151 mg/L)). Two patients needed to be under dialysis. Eighty-three percent of patients have fully recovered without sequelae after two months.
Conclusion : Clinical and biological symptoms in this study correspond to the previous peadiatric european studies. This study confirms that clinical signs are different in children and adult population.
Heamorrhagic fever with renal syndrome is difficult to diagnose, many clinical and/or biological symptoms could appear, serology permiting only to confirm this diagnosis.

ESPID-1025

EVALUATION OF THE IMPLEMENTATION OF THE COCOON VACCINATION STRATEGY AGAINST PERTUSSIS IN THE GHENT AREA, FLANDERS, BELGIUM

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Introduction

Incompletely or non-vaccinated infants are at high risk of infection with *Bordetella pertussis* and its potentially life-threatening complications. Since 2009 the Belgian Superior Health Council has recommended cocoon vaccination, i.e. the administration of a booster dose of Tdap vaccine to parents, grandparents and other close contacts of infants.

Aims

To evaluate the degree of implementation of cocoon vaccination strategy against pertussis in the Ghent area.

Methods

A written questionnaire was used to evaluate pertussis awareness and vaccination rates of young parents having a baby born between 1 January and 31 October 2012. Logistic regression analysis was used to determine the effect of age, nationality and educational level of the mother on pertussis awareness and vaccination. The impact of the hospital where the baby was born was also examined.

Results

Questionnaires were sent to 2261 families and correctly completed by 518 (23,4%). Most mothers were of Belgian nationality (96.6%), highly educated (59% obtained master degree) and 56% aged ≥31 years. 52.8% of respondents (264/500) had been informed about the importance of cocoon vaccination by gynaecologists (56.8%), midwives (31.8%), paediatricians (12.1%) and general practitioners (11.7%). 46.8% (234/500) of mothers and 46.7% (226/484) of their partners were vaccinated. The only variable that significantly influenced the odds of being informed about and vaccinated against pertussis was the hospital where the baby was born.

Conclusions

The implementation of national recommendations on cocoon vaccination strategy against pertussis is suboptimal in the Ghent area. Additional efforts are needed to improve parental awareness and vaccination rate.

ESPID-1026

PTOSIS, MYOSIS, AND CATS

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Introduction

Horner syndrome in children is a rare condition that has traditionally been classified as congenital or acquired. This syndrome can be caused by several etiologies that interrupt the sympathetic pathways that supply the head and neck, including the oculosympathetic fibers.

Clinic Case

A 6 year-old healthy boy, living in a rural village, with regular contact with farm animals, presented a painful left cervical lymphadenopathy. One week later he woke up with ptosis of the left eye. Physical examination also demonstrates homolateral miosis, a volume rise of the cervical lymphadenopathy, generalized small lymphadenopathies, mild hepatomegaly and a cat scratch on the right hand.

A Horner's syndrome caused by lymphadenopathy compression was diagnosed. Treatment was started with amoxicillin clavulanate and azithromycin. He was febrile on the first day of admission and became apyretic 48h later. A clinical improvement was observed, with progressive recovery of ptosis and cervical adenopathy. He had isocoric and isoreactive pupils when he left the hospital at day 5 of hospitalization.

Serology for HIV, CMV, HSV1/2 and toxoplasmosis were negative; EBV VCA IgM negative, VCAIgG positive and EBNA IgG positive. Bartonella IgG was positive 1/61 and after 3 weeks the titer rose to 1/512.

Comments

Infectious diseases are a rare cause of Horner syndrome. To our knowledge, this is the first case relating Horner syndrome and bartonellosis.

ESPID-1027

NEUROCYSTICERCOSIS IN A CHILD PRESENTING TO A LONDON HOSPITAL – DIAGNOSTIC LESSONS

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Introduction:

Neurocysticercosis is common in developing countries following accidental ingestion of *Taenia solium* eggs. In the developed world it is less common and it's management presents a number of problems.

Aims:

Alert the clinician to the diagnostic dilemmas in a case of neurcysticercosis.

Methods:

We present the case of a 6 year old who had coryzal symptoms followed by seizures.

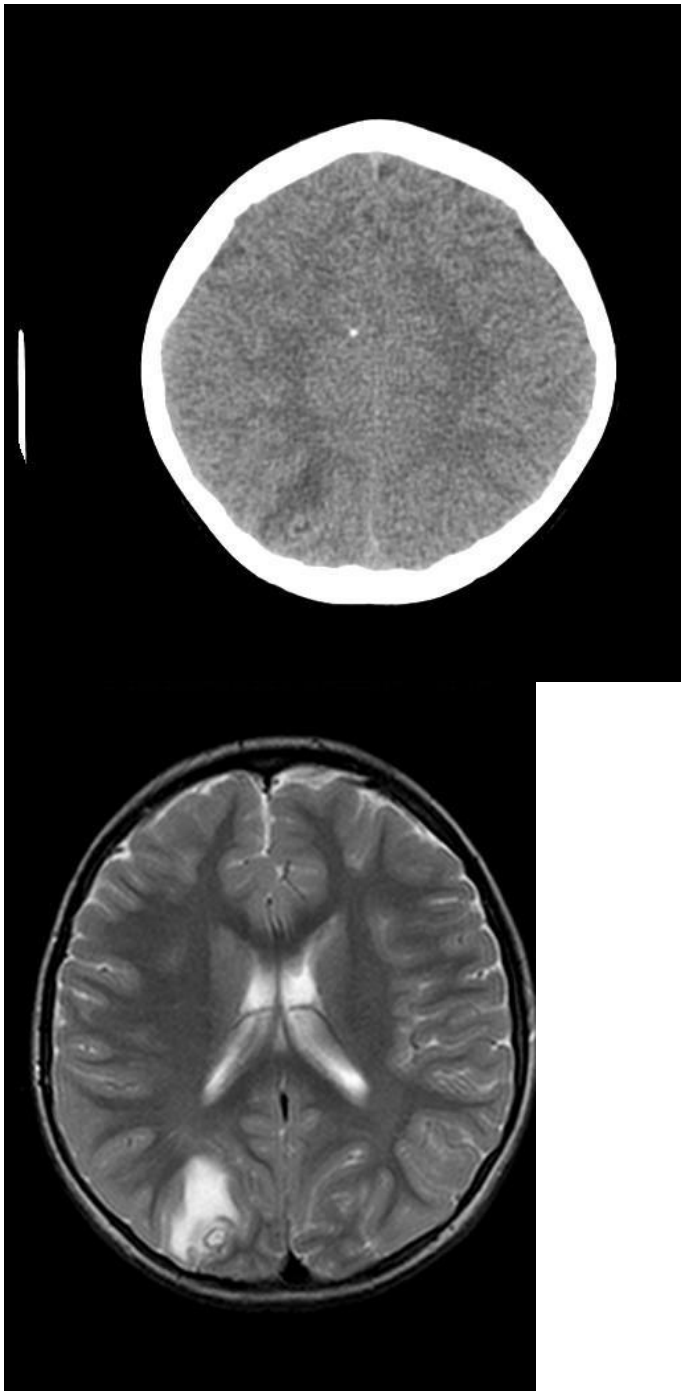
Results:

CT imaging showed a ring-enhancing lesion and 2 foci of calcification (Image 1). Subsequent MRI imaging highlighted a lesion suggestive of a degenerating cysticercal cyst and significant oedema (Image 2). Access to neuroradiologists experienced in interpreting such images and laboratory expertise for cysticercosis serology allowed a rapid diagnosis of neurocysticercosis to be made and stopping of antibiotics/antivirals.

Conclusions:

This case highlights several learning points:

- Initial management of a child with cerebral oedema should always involve stabilisation, with transfer to a tertiary centre with PICU support if necessary.
- The decision to use steroids for cerebral oedema/neurocysticercosis is challenging when presenting features may suggest possible concomitant acute viral infection.
- MRI is often first line and better highlights acute inflammatory changes whilst CT can readily identify old lesions, useful in the diagnosis of this case.
- There is currently limited evidence in paediatrics on duration of treatment and adjunctive treatment (i.e. anti-helminthics and steroids)
- The diagnosis and formulation of an effective management plan in neurocysticercosis should involve a multi-disciplinary approach and benefits from early expert intervention.
- Clinical expertise from overseas doctors with experience in such conditions can be invaluable in the UK



ESPID-1028

SYMPTOMATIC CMV INFECTIONS IN INFANTS: A GERMAN REGISTRY

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Background: Epidemiological data on symptomatic CMV infections in German infants were not available, despite availability and increasing usage of diagnostics and antiviral therapy in this patient group.

Methods: From January 2012 to December 2013 data from all German Children's hospitals on infants with sympomatic CMV infections (organ pathology) were collected with a standardized questionaire involving the ESPED system. Data relating to incidence, clinical course and treatment, among others, was collected.

Results: In total, 92 patients were registered over the course of two years (final data collection still ongoing). Prematurity was found in 31.4% with a median of 29.5 wks of gestation. Clinically, one third of patients showed either dystrophy, hearing disorder, thrombocytopenia, hepatitis or neurologic affectations.

Primary infection during pregnancy was diagnosed in 23%, and postnatal infection suspected in 34%. In n 45% of cases, origin of infection could not be determined.

In 86%, CMV was detected in the urine. Ganciclovir was the main therapeutic drug used, and side effects mostly involved neutropenia and elevation of liver enzymes (88.8%). Duration of therapy varied from 12 days up to one year, with 36% receiving treatment for 6 weeks.

After treatment, urine was positive for CMV in most cases (65%). Only 34% of patients were reported to be in good clinical condition. 4 patients died during the course of infection, mostly from respiratory failure (75%). 8 patients (8.6%) were suspicious of acquired or innate immunodeficiency.

Conclusions: Management of symptomatic CMV infections in infants remains a challenge given the variability of the clinical course and the high incidence of the infections. Controlled clinical studies and guidelines for diagnosis and treatment are urgently needed.

ESPID-1029

SUCCESSFUL TREATMENT OF MULTIDRUG-RESISTANT BACTERIA VENTRICULITIS WITH INTRAVENOUS AND INTRATHECAL COLISTIN IN PEDIATRIC AGE.

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INTRODUCTION
CNS infections due to multiresistant bacteria are an emerging problem in neurosurgical patients. Colistin could represent a good therapeutic option, however it has poor CNS penetration.
OBJECTIVES
We report our experience with intrathecal colistin in order to determine its efficacy and safety for the treatment of infections caused by multidrug-resistant bacteria in pediatric age
METHODS
A 4-year-old girl who had a car accident requiring decompressive craniectomy;a 8-month-old boy with posthemorrhagic hydrocephalus that underwent multiple ventriculoperitoneal shunt placement; a 10-year-old girl with a spontaneous intracerebral hemorrhage and decompressive craniectomy received inthratecal colistin for CSF infection caused by multidrug resistant bacteria (respectively a Carbapenem-Resistant Pseudomonas aeruginosa, an Extended-Spectrum-β-Lactamase-Producing Escherichia coli and a multidrug-resistant Acinetobacter baumannii).
RESULTS
All these children were treated with colistin administered by an intrathecal route and by an intraventricular route for 21 days. The daily dose of intratechal colistin used ranged from 1.2 mg every 12 h to 6 mg every 12 h. The median time necessary to obtain cerebrospinal fluid sterilization was 5.4 days, and treatment was always successful. No clinical or laboratory sign of toxicity probably or possibly related to the topical administration of colistin was noted.
CONCLUSIONS:
Topical colistin can be an effective and safe treatment for children with CSF infection caused by multiresistant bacteria.

ESPID-1030

OPEN DOORS TO PNEUMOCOCCUS

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Introduction:
Streptococcus pneumonia (SP) is one of the most common meningitis pathogens in children and has a markedly high case fatality. SP is often carried in the upper respiratory tract but few individuals become ill.
Clinical report:
The authors present a 14-year-old girl, admitted after generalized tonic-clonic seizure preceded by fever, headache, vomiting and altered mental state, which she maintained after seizure. Brain CT-scan revealed basilar skull fissure and frontal sinusitis. History of head trauma was confirmed afterwards, without surgical treatment then. A tick was extracted from gluteal area. Lab tests showed leukocytosis 40700/mm3 and neutrophilia, CRP 107,9mg/L and respiratory acidosis. Turbid but normotensive cerebrospinal fluid (CSF), with 2000 cells/mm3, PMN predominance. Meningoencephalitis treatment was started with ceftriaxone+vancomicin+acyclovir+doxiciclin, the last 2 being stopped after identification of CSF Gram+ diplococci and negative Weil-Felix reaction. CSF culture was positive for SP. After 24h of hospitalization, she was transferred to a pediatric ICU due to suspected cerebral herniation. She completed 4 days of vancomicin and 14 days of ceftriaxone and had the 1st Prevenar13®. She was discharge after 14 days, without any neurological deficits. Surgical correction of cranial fissure was performed 2 months later.
Conclusions:
Basilar skull fracture is an important risk factor to the development of pneumococcal meningitis as it creates an open door to the SP commonly colonizing the upper respiratory tract of healthy children. Despite severe clinical presentation the outcome in this case was favorable, reinforcing the importance of prompt introduction of antibiotics in this clinical setting.

ESPID-1031

STREPTOCOCCUS PNEUMONIAE AND STAPHYLOCOCCUS AUREUS PANTON-VALENTINE LEUKOCIDIN-POSITIVE (PVL+) IN PARAPNEUMONIC EFFUSIONS IN LARISSA, CENTRAL GREECE (2005-2013)

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Introduction: An increase in pediatric community-acquired pneumonia (CAP) with parapneumonic effusion has been noted worldwide.
Aim: To study the cases of complicated CAP with parapneumonic effusion requiring drainage.
Methods: We reviewed the charts of all patients discharged from the Department of Pediatrics with the diagnosis of CAP from January 2005 to December 2013. The pleural fluid was tested by PCR for *Streptococcus pneumoniae* (Pnc).
Results: Thirty-four cases of complicated CAP wih parapneumonic effusion requiring drainage were identified (2005-2008: 13 cases, 2009-2013: 21 cases). The median age was 3.8 years (range 21 days to 10.3 years). All *Staphylococcus aureus* isolates were recovered from cultures of purulent pleural fluid samples. Pnc as the etiologic agent was identified in 4 cases by blood and/or pleural fluid culture and in 11 by PCR (Table). The Pnc serotypes were 3 (n=6), 19A (n=3), 7F (n=1), serogroup 9 (n=1), and nontypeable by the applied PCR (n=4). The immunization status was known for 32 children; 23 had received ≥1 dose of pneumococcal conjugate vaccine (PCV). One of the children with complicated CAP due to serotype 3 Pnc had been vaccinated with one dose of PCV13 administered as a booster at the age of 21 months.
Conclusions: (1) The majority of cases with an identified pathogen were of pneumococcal etiology and 40% of these cases were due to serotype 3. (2) *S. aureus* (PVL+) was the second most common pathogen.

Pathogen	No. of cases	Empyema
Streptococcus pneumoniae	15	15/15
MRSA (PVL+)	4	4/4
MSSA (PVL+)	1	1/1
Streptococcus spp.	1	1/1
Unknown	13	6/13 (46.2%)

ESPID-1032

MYD88 DEFICIENCY: A CLINICAL CASE

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Introduction

Myeloid differentiation factor (MyD) 88 deficiency is a newly described primary immunodeficiency. It impairs proinflammatory cytokines synthesis, leading to recurrent and severe pyogenic bacterial infections.

Case Report

A 7 months-old gipsy girl, with consanguineous parents, was admitted with right lobar pneumonia and hypoxemia. The blood count revealed a raised WBC count of 17.13 x 10^9/L (neutrophils 70.6% and linfocytes 26.4%) serum C-reactive-protein 0.4 mg/dL. She was treated with amoxicillin/clavulanate with a good outcome. *Streptococcus pneumoniae* serotype 9 grew on blood culture. She had a female sibling with *Streptococcus pneumoniae* 6B sepsis and meningitis at 24 months-old that died with sepsis of unknown origin 7 months later; and a cousin with a severe *Pseudomonas aeruginosa* eye infection in newborn, that died with sepsis in early infancy. Immunoglobulins, complement levels, and lymphocyte subsets were normal. Exon 2 of MyD88 gene was sequenced, revealing homozygous E65del (c.del192-194) mutation in the child (Inserm Institute); both parents were heterozygous for this mutation. She started prophylaxis with cotrimoxazole, amoxicillin and monthly intravenous IgG. At 6-month follow-up she remains asymptomatic.

Conclusions

MyDD88 deficiency, as IRAK4 deficiency, should be suspected in children with pyogenic infections and no significant fever nor elevated C-reactive-protein. The same mutation had already been found in other gipsy communities outside Portugal and ethnicity may be considered an additional alert for this disease.

ESPID-1033

IMPACT OF A MANAGEMENT PROTOCOL FOR THE OSTEOARTICULAR INFECTION IN THE DIAGNOSIS, TREATMENT AND OUTCOME OF CHILDREN WITH SEPTIC ARTHRITIS

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Background. Septic arthritis (SA) is a severe infection in children. Objectives. This study was designed to evaluate the implementation of a management protocol in the outcome of these children. Methods. In 2008, a protocol designed by the Pediatric Infectious Disease and Pediatric Orthopedics for the management of children with osteoarticular infections (OAI) was implemented in a tertiary hospital. This protocol focused on diagnostic tests, antibiotics, hospital stay and length of therapy. Children enrolment was performed prospectively, but data obtained retrospectively. We compared two periods of time: P1 (2003-2007) and P2 (2008-2013). Results. Eighty two children were enrolled in the study (median 17 months; 61% males). Children enrolled in P2 were younger (13 vs 36 months; p=0.002) with more severe disease: more fever (77 vs 45%; p=0.01) and higher CRP and ESR (4.2 and 62.5 vs 1.7 and 47.6, respectively). Hip and knee were the most frequently involved joints (45 and 34%, respectively). An agent was detected in 48% of children, especially kingella kingae (37.5%) and S. aureus (35%). Narrower spectrum antibiotics were used in P2 (60 vs 12%; p<0.001). There was not a difference between periods in terms of length of therapy or duration of admission. Nevertheless, since there were more very young infants and associated osteomyelitis in P2, once these children were removed there was a significant reduction in the duration of hospitalization (11.9 vs 9.4; p=0.028). Conclusions. The implementation of a protocol for the management of OAI in children had a clear benefit in the management of SA.

ESPID-1034

ACUTE OSTEOMYELITIS IN CHILDREN: SEARCHING A BETTER MANAGEMENT

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Background: The diagnosis of pediatric osteomyelitis is challenging in an early phase but important, since an optimum management is essential to avoid further complications.

Methods: Medical charts of children <14 years hospitalized with osteomyelitis in a tertiary paediatric hospital in Madrid, Spain, were reviewed. In December 2007, an action protocol for osteomyelitis agreed by Orthopedic Surgery and Paediatric Infectious Diseases was set. Demographic, clinical, laboratory and microbiological parameters were analyzed and further compared between patients admitted before and after the establishment of the protocol.

Results: From 1/2002 to 12/2013, 109 children with osteomyelitis were admitted (67% males, 31 [10-88] months). The most frequent location was foot (19%), followed by shinbone (15%) and femur (13%). A risk factor was found in 26% of the patients and 39% had fever during admission. MRI and scintigraphy were able to diagnose 88% and 75% of the osteomyelitis, respectively. Etiology was found in 29% of the children and MSSA was the most common pathogen isolated (65%). After protocol establishment (2008-2013), a significant decrease of broad spectrum antibiotic usage and an earlier normalization of CRP were observed. Patients with microbiological identification had longer hospitalization stay ($p<0.01$), higher maximum CRP ($p<0.001$), higher ESR ($p=0.012$), longer duration of intravenous treatment ($p<0,001$) and more complications($p<0.001$).

Conclusions: Management of osteomyelitis improved in our hospital since a protocol was established, especially by decreasing broad spectrum antibiotic usage. Moreover, patients with a microbiologic etiology showed higher levels of inflammatory parameters, longer hospital admission, worse clinical outcome and needed longer IV treatments.

ESPID-1035

ASSOCIATION OF 2009 H1N1 INFLUENZA VIRUS WITH TEMPORAL TRENDS IN SEROTYPES CAUSING INVASIVE PNEUMOCOCCAL DISEASE

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- Background and aims: The aim of this study was to determine if the introduction of the Influenza A(h1N1)pdm09 was associated with temporal trends of main serotypes causing invasive pneumococcal disease (IPD).

- Methods: Patients <18 year-old with invasive pneumococcal disease microbiologically confirmed by PCR or culture in normal sterile fluids and attended in a tertiary care pediatric hospital (Hospital Sant Joan de Déu, Barcelona), from week 40/2007 to week 39/2012, were included. Data from the Microbiological Catalan Notification System was used in order to define influenza epidemic periods.

- Results: 384 episodes of IPD were diagnosed during the study period. 156 (40.6%) of them occurred during the influenza quarters. The number of IPD episodes diagnosed during the 2009 pandemic quarter (51 episodes) supposed almost one-third of all the IPD episodes diagnosed over the five included influenza periods. In that periods, the main detected serotype was serotype 1 (28, 17.9%) followed of 3 (19, 12.2%) and 19A (18, 11.5%). However, only 2 episodes of IPD were caused by serotype 1 during the pandemic season.

- Conclusions: The proportion of IPD episodes caused by serotype 1 during the 2009 pandemics was significantly lower than in the pre-pandemic period and it remained very low during the period that spanned from the initiation of the 2009 pandemics to the following influenza season, when it started to increase again. Seasonality and circulation of respiratory viruses could affect the temporal trends of serotypes causing IPD.

ESPID-1038

LATE ONSET GROUP B STREP INFECTION IN NORTHERN IRELAND 2008-2010

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Background: Rates of early onset group B strep have decreased since introduction of intrapartum prophylactic antibiotics. British Paediatric Surveillance Unit (BPSU) figures for late onset GBS(LOGBS) suggest an increase between 2003 and 2010 (0.18 per 1,000 live births in 2003 and 0.28 per 1,000 in 2010). We present multisource data on 3 years of late onset GBS septicaemia and meningitis in Northern Ireland.

Methods: A case was defined as GBS culture from a normally sterile site from day 7-89. Laboratories provided a list of patients with GBS culture. A proforma was compiled and mother and baby charts were reviewed by 3 doctors. Data was cross-checked with the public health database.

Results : 25 cases were identified (0.32/1,000 live births). 4 patients grew GBS in CSF and there was one case of septicaemia complicated by osteomyelitis. The remaining patients had septicaemia. There was one death at 20 months in a child with serious neurodisability and another complicated by NEC. Preterm deliveries accounted for 75% of those delivered (50% generally reported elsewhere). 2 patients had recurrence of EOGBS.

Preterm	18
Term	6
<1500gm	11
1500-2499gm	5
>2,500gm	7
Neurodisability	5 (6 unknown)
Death	2
C-section	15
Normal delivery	10

Conclusion There remains a significant burden of LOGBS disease in Northern Ireland, causing neurodevelopmental impairment and death. Our rate of 0.32 is slightly higher than the BPSU report from 2010. This incidence rate for LOGBS was similar to a recent Italian study[i] (data 2003-2010) of 0.32/1000.

[i] Berardi A et al, Group B Streptococcus Late-Onset Disease: 2003-2010 Pediatrics 2013:131:e361

ESPID-1040

ANTIBIOTIC OVERPRESCRIPTION IN DEVELOPING COUNTRIES – EXPERIENCE OF A PRIMARY HEALTH CARE CENTRE IN MOZAMBIQUE

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Background and aims: The WHO considers the inappropriate use of antibiotics as the main trigger for resistance, namely through overprescription and unregulated dispensing in developing countries. We explore the patterns of antibiotic prescription in a series of patients treated by non-medical health care providers in a primary healthcare centre in Maputo, Mozambique.

Methods: Retrospective analysis of clinical records of children treated in Polana Caniço Primary Health Care Centre's emergency consult during September 2013. All collected data (including demography, clinical presentation/diagnosis and treatment) was analysed with MS Excel 2010®.

Results: During the study period, 1642 children were admitted, with a mean age of 4.2 years (standard-deviation of 4 years), 53% female. After excluding 636 records (38.7%) for being incorrectly registered, we analysed the remainder 1006 (61.3%). The main clinical presentation/diagnosis was upper respiratory tract infection (URTI; 32.2%), followed by fever (17.6%), acute gastroenteritis (AGE; 10%) and malaria (8%). The most prescribed medications were paracetamol (63.9%), co-trimoxazole (38.5%) and phenoxymethylpenicillin (20.1%). 91.3% of all patients were treated with at least one antibiotic and 13.5% with more than one simultaneously. At least one antibiotic was prescribed in 92.6% of patients presenting with URTI, 93.2% of those presenting with fever and 99% of those presenting with AGE.

Conclusions: Providing health care workers with continuous training concerning rational prescription of antibiotics is essential to prevent widespread overprescription, which may lead to short-term (unnecessary side effects, rupture of limited stocks) and long-term problems (population-level emergence of resistance).

ESPID-1041

THE MOLECULAR DISTANCE TO HEALTH (MDTH) GENOMIC SCORE CLASSIFIES INFANTS WITH HUMAN RHINOVIRUS (HRV) INFECTIONS ACCORDING TO DISEASE SEVERITY

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Background and aims:

HRV are one the the most frequent viral etiologic agents of bronchiolitis and wheezing in children. However, studies have shown that HRV can be detected in 10-20% of asymptomatic subjects. We sought to define the role of HRV detection in infants with asymptomatic, mild and severe HRV infection by applying gene expression profiles.

Methods

Whole blood samples were collected in infants from Finland, Spain and USA and classified in 4 groups: 1) HRV- healthy controls (HC; n=22); 2) HRV+ asymptomatic (n=16); 3) HRV+ upper respiratory tract infection (URI-mild; n=18) and; 4) HRV+ lower respiratory tract infection (LRTI-severe; n=59). RNA samples were analyzed using Illumina arrays and GeneSpring Software. A genomic score (MDTH) was applied to classify infants with severe LRTI, mild URI, asymptomatic HRV+, and HC .

Results

A total of 93 children with HRV+ detection (median age 10.2 months) and 22 age, gender and race matched HC were included in the analyses. Statistical group comparisons identified 614 significantly expressed genes (HRV biosignature) between infants with severe HRV LRTI (n=30) and HC (n=9). The HRV profile was validated in an independent cohort of children (n=29) and HC (n=8). MDTH scores derived from the HRV biosignature increased according to disease severity: LRTI>URI>asymptomatic HRV+>HRV- HC (Kruskall-Wallis; $p<0.001$).

Conclusions

HRV induces a reproducible host immune response in children with LRTI. A genomic score showed significant differences according to disease severity in infants with HRV infection.

ESPID-1042

KINGELLA KINGAE AS THE MAIN CAUSE OF SEPTIC ARTHRITIS IN A COHORT OF CHILDREN IN SPAIN

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Background. Kingella is an emergent pathogen causing septic arthritis (SA) in children. Objectives. To analyze the etiology of SA from a cohort of children in Madrid, Spain, with especial interest on infections caused by K. kingae. Methods. Medical charts of children enrolled in a Spanish cohort from 2003-2013 were reviewed. Children were enrolled retrospectively until 2007, and prospectively from then on. Children with K. kingae SA (KK) were compared with children with SA caused by other bacteria (NK). Results. Thrty nine of 82 children with SA (48%) had a bacterial isolate, being more frequent in the second part (P2,2008-2013; 62%) than in the first part of the study (P1-2003-2007; 31%); p=0.018. This may have been secondary to a higher proportion of blood cultures obtained in P2 (85 vs 49%; p=0.001) and the performance of bacterial PCR in synovial fluid since 2009. The main etiologies were K. kingae (37.5%; 52% in P2 vs 0% in P1, p=0.003) and S. aureus (35%; 24% in P2 vs 63% in P1, p=0.029). There were 2 (7.5%) isolates of MRSA. Other bacteria involved were S. pyogenes (10%), S. penumoniae (7.5%) and enterobacteria (10%). Children in KK had lower proportion of young infants (0% < 3 months vs 36%; p=0.016), lower CRP on admission (4.2 vs 10.8, p=0.029), shorter hospital stay (8 vs 14 days; p=0.001) and shorter duration of therapy (26 vs 41 days; p=0.024). Conclusions. K. kingae is a very common bacteria in SA in children, producing a milder clinical syndrome than other etiologies.

ESPID-1043

ESTIMATING POSITIVE PREDICTIVE VALUE OF THE ROTAVIRUS ICD-9-CM DICHARGE CODE: WHAT TO DO WITH CASES WITHOUT LABORATORY RESULT?

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Aims: We aimed to estimate the positive predictive value (PPV) of the ICD-9-CM code for rotavirus disease in the Spanish hospital discharge database (CMBD) including patients without microbiological confirmatory result.
Methods: Retrospective study in the Valencian Region, Spain, among children admitted to public hospitals during January 2007-June 2012, with a discharge code of rotavirus (008.61). We assessed the PPV of the rotavirus code in any diagnosis position among cases with available laboratory results from the regional microbiological database (RedMIVA). Differences in the distribution of children with and without test results were assessed by logistic regression including age, admission year, rotavirus circulation, and hospital. Imputation for children without test results was done by a bayesian model, using the same variables. To account for the lack of randomness in the distribution of the children, adjustment was performed using propensity scores. The PPV was obtained from the adjusted model, which included information on children without test results.
Results: There were 1,987 discharges with rotavirus diagnosis; median age was 0.9 years (range 0-5.3). Rotavirus stool tests were performed and retrieved in 1,581 cases (80%); PPV was 90.8% (CI 95%:89.3-92.2). Children with and without test results were different on age, admission year, and hospital. Hospital was significant in the bayesian model. Propensity scores included age and admission year; this adjustment was non significant. Imputed PPV was 89.7% (CI 95%:87.8-91.6).
Conclusions: Our results have shown that untested rotavirus cases could be included to increase power in rotavirus vaccine effectiveness and safety studies in Spain.

ESPID-1046

ACUTE VISION LOSS IN AN HIV INFECTED CHILD

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Background and aims:

HIV infected children on combined antiretroviral therapy (cART) live longer but are at risk of comorbidities.

The authors present the case of an HIV1 infected child who had a sudden vision loss.

Methods:

The authors reviewed the clinical, analytical and radiological records.

Results:

A 10-year-old boy with HIV1 infection, previously compliant to cART (zidovudine, didanosine, and lopinavir/ritonavir), was admitted in August 2013 for sudden severe visual acuity loss. He had a best corrected visual acuity < 20/200 bilaterally and slight papillary oedema. Four months previously he had undetectable viral load and normal CD4 cell count. Didanosine toxicity was considered. The blood tests revealed 204 CD4 cells/mm3 (17.4%) and the viral load was 204,000 copies/mL. He acknowledged cART interruption. CSF analysis showed 58 cells/uL (mononuclears), normal protein and glucose. Brain MRI showed three focal white matter lesions of autoimmune/inflammatory/infectious cause and signs of bilateral optic neuritis. Secondary/opportunistic infections and autoimmune diseases were not found. Corticotherapy was started on day8, with gradual improvement. Didanosine was replaced by abacavir, viral load diminished and CD4 recovered. At 4-months follow-up his best corrected visual acuity is 20/40 bilaterally, without other neurological abnormalities.

Conclusions:

Acute complications in HIV infected children can be complex. The immune status, the direct effects of HIV, and drug toxicity have to be considered. In this case, an optic neuritis was associated with a virological failure, and improved with reinstitution of cART and corticotherapy suggesting an inflammatory response to the virus in a previously suppressed child.

ESPID-1048

RESURGENCE OF INVASIVE GROUP A STREPTOCOCCAL INFECTION IN CHILDREN IN IRELAND WITH HIGH ASSOCIATED MORTALITY

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Background: We report the resurgence of invasive group A *Streptococcus* (iGAS) in Ireland (2.66/100,000) with high case fatality rates (CFR) 2012, and 2013..

Aim: To determine clinical characteristics, associated morbidity, mortality and identify severity risk factors.in children during 2012-2013,

Methods: All with confirmed or probable iGAS infections admitted to Dublin tertiary paediatric centres during 2012-13 were included. Data was retrospectively collected, enhanced by national figures (Health Protection Surveillance Centre and *emm* typing.

Results: 66 children (9 probable, 56 confirmed) with iGAS were identified, M:F ratio 1.3:1, 28 (42%) <2yrs,. *Emm* typing was available for 60% of cases: *emm* 1, 53%. CFR was 10.6%. There were 7 deaths: 4 streptococcal toxic shock syndrome (STSS), sepsis/meningitis (1), spontaneous peritonitis (1), septicaemia (1). 32 (48%) cases required ICU; including15 severe respiratory conditions (tracheitis (3), empyema (9), pneumonia (2), retropharyngeal abscess (1)). 10 (15%) had osteoarticular involvement and 2 had mastoiditis. Surgical intervention was required in 70%. Varicella associated disease occurred in 20 % (11). 4 children had other risk factors for severe disease; immunosuppressive therapy (1), CHD (1), immunodeficiency (2). 41 (62%) had no identifiable risk factor.

Conclusion: iGAS mortality now far exceeds that for meningococcal infection in our centre. Over 50% of children required ICU admission with the majority having no identifiable risk factor for severe disease. Early identification and appropriate treatment and, ultimately ,GAS vaccination are needed if outcomes are to improve.

ESPID-1049

SEVERE CENTRAL NERVOUS SYSTEM COMPLICATIONS AFTER INFLUENZA VIRUS INFECTION IN PAEDIATRIC PATIENTS

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INTRODUCTION. Influenza virus can cause common respiratory tract infections and rarely multiorgan system disorders, resulting in mild infection, severe respiratory disease or systemic disease and complications. Limited information regarding neurologic complications has been reported in children with Influenza infection.

METHODS: Four children admitted to the pediatric intensive care unit between October 2009 and February 2010 at the Policlinico Gemelli University Hospital of Rome with altered mental status and influenza infection.

RESULTS: The age ranged from 3 to 24 months. All children, demonstrated an altered level of consciousness at admission, and seizures in three child. All children had abnormal electroencephalograms early in their intensive care unit course and 100% had abnormal imaging studies. All four cases had no evidence of viable Influenza Virus in the CSF. We diagnosed two acute necrotizing encephalopathy, a non necrotizing encephalopathy and a stroke.
They all were treated with Oseltamivir twice daily for 5 days immediately after nasal and throat swab testing. Influenza B virus were detected in two cases and influenza A H1N1 (swine) virus in the the other two. 50% children survived and of these 50% had severe neurological deficits at hospital discharge.

CONCLUSION: Although neurological complication are uncommon compared with the high incidence of influenza infection, they are nearly always severe with high mortality and neurological sequel. Thus, awareness and diagnosis of encephalopathy/ encephalitis in the setting of influenza is important in order to provide appropriate monitoring and treatment for this life threatening condition.

ESPID-1050

INTERVENTIONS ASSOCIATED WITH REDUCTION IN LATE ONSET SEPSIS AND CATHETER RELATED BLOOD STREAM INFECTIONS IN PRETERM INFANTS

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Background: Late onset sepsis (LOS) and Central line associated blood stream infection (CLA-BSI) remains a major cause of mortality and morbidity in preterm infants. Numerous interventions aiming to reduce the hospital based infections were introduced at various time intervals with in the Royal London Hospital Neonatal unit, between 2007 and 2012.

Aim: To investigate the effects of hospital wide and local interventions on LOS and CLA-BSI rates in preterm infants born at <32 weeks gestation.

Methods: Bed care days (BAPM 2001 standards) and catheter days were obtained from Neonatal database, positive blood cultures were obtained from Microbiology laboratory database. Poison regression model was used to evaluate the effect of each intervention on the CLA-BSI and LOS rates.

Results:

Infection	Intervention	Reduction (95% CI)	P value
CLA-BSI	*Specialist nurse,2%Chlorhexidine, continuous vancomycin infusion*	45% (33% - 61%)	< 0.001
	Aseptic No Touch Technique	53% (37% - 75%)	0.001
Late Onset Sepsis	*Specialist nurse, 2% Chlorhexidine, continuous vancomycin infusion*	55% (40% - 74%)	<0.001
	Skin antisepsis guideline	64% (47% - 87%)	0.005
	Audit of peripheral venous catheter practices	172% (104% - 284%)	0.035
	Move to new building	54% (34% - 88%)	0.013

Conclusions: A multifaceted approach involving a change in policy, education, training and surveillance can reduce catheter related and late onset sepsis in a Neonatal unit.

ESPID-1051

COMPARISON OF THE ANTI-PNEUMOCOCCAL TOTAL IGG AND SEROTYPE-SPECIFIC IGG ASSAYS TO MEASURE IMMUNITY IN PAEDIATRIC COHORT

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Background and aims:
Anti-pneumococcal antibodies are measured after vaccination or infection to assess for possible immune deficiency or evaluate the need for re-vaccination. The clinical interpretation of anti-pneumococcal antibodies is complicated by vaccinations, age and the variation in criteria used to determine protective responses. Two anti-pneumococcal serological assays are clinically available: total anti-pneumococcal IgG assay and serotype specific assay.
This study explores the relationship between these two assays and their clinical utility.

Methods: Between January 2008 and December 2010 87 paediatric patients had concurrent anti-pneumococcal total IgG and serotype specific assays performed. All patients had been previously immunised with *Prevenar* 7 vaccine. Pneumococcal immunity on total IgG assay was deemed as ≥20μg/ml. The serotype specific assay reported individual IgG results to all 7 pneumococcal serotypes present in the *Prevenar* 7 vaccine. Various criteria were studied for a protective serotype specific assay response.
Patients were deemed immune or non-immune to pneumococcus by both assays and these results were compared.

Results: Discrepancies in immune status were found in 36-39% of patients when the 2 assays were directly compared. Consistently more patients were deemed immune on the serotype specific assay. The assays were most concordant when threshold for serotype specific immunity was all 7 *Prevenar* serotypes ≥0.35μg/ml (sensitivity 64.8%, specificity 77.1%) or 4 of 7 serotypes were ≥1.3μg/ml (sensitivity 63.0%, specificity 69.7%).

Conclusions: The two assays are both utilised clinically to determine anti-pneumococcal immunity but do not correlate well. More children more deemed immune to pneumococcus by the serotype specific assay.

ESPID-1052

CEREBRAL TOXOPLASMOSIS IN A PREVIOUSLY "HEALTHY" ADOLESCENT

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Toxoplasma encephalitis has been historical considered one of the most important opportunistic infection in HIV patients; it can manifest like a cerebral mass mimicking CNS tumors.

17 year-old female born in Guiné-Bissau, living in Portugal since 12-year-old, with no other relevant medical history. Five days prior to admission she presented with fever, headache, vomits and behavioural changes. In the ER psychomotor slowing, weakness, nystagmus, diplopia and nuchal rigidity were noted. CT suggested HIV encephalopathy and MRI showed intra-axial expansive infiltrative lesion (suggesting a primary lymphoma) and multiple other minor lesions. CSF analysis revealed: hypoglycorrhachia, hyperproteinorrhachia, HIV1 viral load (HIV1-VL) 674500copies/ml, Polymerase-chain-reaction positive for toxoplasma and EBV (no other microbes or neoplasic cells). Plasma HIV-VL was 526500copies/ml; CD4 counts 9 cells/mm^3. Treatment with pyrimethamine, sulfadiazine and folinic acid started on day-1 of hospitalization and combined anti-retroviral treatment on day-11. She had intermittent episodes of auditory-visual hallucinations. Dysautonomic symptoms emerged on day-36. Clinical and imagiological deterioration led to a brain stereotaxic biopsy which confirmed Toxoplasma infection. No other microbe or neoplastic cells were found. Clindamycin substituted sulfadiazine. A reduction of the lesions was documented on day 73^{th} and she slowly improved. Currently, she has an undetectable HIV1-VL in plasma and 69 CD4 cells/$mm^{3.}$

This case may represent a late manifestation of HIV infection, probably acquired in early infancy. HIV test should be offered to anyone coming from countries with high prevalence of HIV infection irrespective of their health status. A severe disease with a protracted course would have been avoided.

ESPID-1053

NEONATAL CAMPYLOBACTER INFECTION: A DIAGNOSIS THAT SHOULD BE BORNE IN MIND

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Introduction

Campylobacter infection is an important cause of gastroenteritis worldwide. Infants are at increased risk of complications, but grossly bloody stools or fever may be the only manifestations in newborns. Transmission is food or waterborne, but fecal-oral transmission has also been reported, namely between household contacts, pre-school children in daycare, and through household pets' infection.

Case Report

A healthy 17-days-old girl with fever and diarrhea was admitted to our service for evaluation. Epidemiologic history: mother with diarrhea through pregnancy; the family has one dog. She was well until 18 hours before admission, when she started fever, breastfeeding refusal and liquid, foamy, foul smelling stools. On physical examination she was ill appearing, grunting, and febrile (37,8ºC). Blood, urine and CSF were obtained, showing only elevated C-reactive protein (21,1mg/L). Treatment for sepsis was started with iv ampicilin and gentamicin. Her clinical situation improved within 48h. After 5 days C.*jejuni* was identified in the admission stool culture. As she was subfebrile at day 6, a control stool culture was obtained which identified C.*jejuni* (at day 11), so the treatment was changed to azythromycin in order to treat the enteric infection. The girl was discharged after 16 days, asymptomatic, remaining well after 2 months of follow-up.

Discussion

This case of neonatal sepsis is representative of the potential clinical severity of campylobacter infection in newborns. Despite being a rare infection in industrialized countries, we have to consider enteric infection by Campylobacter when newborns present diarrhea.

ESPID-1054

TRIBE DEPENDENT PNEUMOCOCCAL SEROTYPE AND RESISTANCE DISTRIBUTION IN THE PEDIATRIC POPULATION OF JORDAN, 2008-2010

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Introduction: *Streptococcus pneumoniae* is one of the leading causes of death worldwide which can disseminate through colonizers to cause pneumonia, meningitis, septicemia and others. Objectives: In Jordan, tribes with the same family name are colonized in small villages and districts. Aims: Determine pneumococcal carriage rate, resistance and serotype distribution from children attending daily care centers. Methods: Nasopharyngeal swabs were taken from 533 healthy Jordanian children from two districts having 36 small villages in Jordan; Wadi Al Seer (n = 118 cases) and Ajlun (n = 415 cases). Optochin sensitivity and bile solubility were used tor the identification. Isolates were analysed for antimicrobial susceptibility, serotyping using the Neufeld Quellung method. Results: Total pneumococcal carriage in Wadi Al Seer and Ajlun was 55.9% and 57%, respectively. Resistance rates in Wadi Al Seer and Ajlun was as follows: Penicillin (87.7%; 82.6%), erythromycin (57.9%; 40.4%), clindamycin (35.1%; 22%), trimethoprim-sulfamethoxazole (75.4%; 56%), tetracycline (52.4%; 35.8%). Predominant serotypes in Wadi Al Seer were 19F (19.0%), 6B (17.5%), , 23F (12.7%), 35B (6.3%), 11A and 15A (4.7%) each, 14, 6A, and 19A (3.2%) each; whereas in Ajlun 6A (14.7%), 19F (12.8%), 6B (6.4%), 15B (6.4%), 23F (6.4%), 11A (5.5%). Serotypes as 3 (0.9%), 35C and 16B with (0.8%) each, 7F (0.8%) and 31 (0.8%) were localized and restricted to certain areas among some tribes, not found in others. Conclusions: Carriage and resistance of pneumococci in Jordan is relatively high. Localizing specific serotypes among specific areas with specific tribes can be better controlled in addition to the available vaccines.

ESPID-1056

MARKED REDUCTION OF PROVIRAL HIV DNA BY VERY EARLY COMBINATION ANTIRETROVIRAL THERAPY IN A PERINATAL HIV INFECTED INFANT: AN UPDATE

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Background: Combination Antiretroviral treatment (cART) by 31 hours of age led to HIV remission in the Mississippi Child . We report a second perinatally-infected infant on cART by 4 hours of age through age 8 months to date.

Methodology: Standard HIV DNA , RNA , ELISA, western blot, CD4+ CD8+ T cells assays were used to confirm infection and viral response. Replication-competent proviral genomes were identified by limiting dilution viral outgrowth assay. Non-induced proviral genomes were quantified by Droplet digital PCR (DD-PCR) of culture-negative wells.

Results:

An infant with high-risk HIV exposure started on cART at 4 hours of age had confirmed HIV infection by positive PBMC HIV DNA PCR (4hours,) HIV RNA 217 ,(36 hrs), HIV CSF RNA 32 copies/mL DOL# 6. Plasma HIV RNA was undetectable on DOL#10 through age 8 months. HIV DNA was negative by DOL#5, and at 48 , 71 DOL. Replication-competent HIV was not recovered from resting CD4+ T cells at 1 and 3 months; non-induced proviral genomes were detected by DD-PCR, in culture-negative wells, at 1 but not 3 months of age. At age 8 months, HIV antibody is indeterminate by western blot, CD4+ T cells normal.

Conclusions

CARTat 4 hours of life in an HIV-infected infant led to clearance of replicating virus and an undetectable proviral DNA by clinical assays within 5 DOL, supporting restriction of HIV spread with very early cART. Sensitive laboratory markers and standardized clinical approaches are needed for optimal management of very early treated HIV infected infants in order to achieve HIV remission

ESPID-1057

POLYMORPHISMS IN CISH GENE PROMOTER ARE ASSOCIATED WITH REDUCED PROMOTER ACTIVITY AND SUSCEPTIBILITY TO TUBERCULOSIS IN CHINESE CHILDREN

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Introduction: Tuberculosis (TB) is the leading cause of death worldwide. A series of candidate genes were suggested to be associated with development of TB disease. The human CISH gene was very recently reported to be involved in T cell activation and differentiation in response to Mycobacterium tuberculosis infection.

Objectives:A case-control study enrolled 352 TB patients and 527 healthy controls, all of Han Chinese ethnicity and aged from 0.2 to 18 years.

Aims: We studied an association between the CISH promoter polymorphisms and pediatric tuberculosis.

Methods: CISH gene promoter SNPs rs414171, rs622502 and rs809451 were genotyped in all subjects and transcriptional activity, mRNA level, and plasma cytokine level of subjects with different genotypes were further examined.

Results: Carriers with rs414171TT homozygotes and rs809451GC heterozygotes had a 1.78-fold (95% CI,1.16-2.74) and 1.86-fold (95% CI, 1.26-2.74) excess risk of developing TB compared to those with wild-type genotypes. A greater risk of TB disease was observed in population carrying the C-809451-T-414171-C-622502 haplotype (OR 3.66, 95% CI:2.12-6.32). A G-809451-A-414171-C-622502-containing CISH promoter drove a 5.43-fold increased reporter expression compared to the C-809451-T-414171-C-622502-containing counterpart in Hela cell lines (P=0.0009). PBMCs carrying rs414171TT homozygotes and rs809451GC heterozygotes showed a reduced CISH mRNA level compared to cells carrying wild type genotypes. Individuals with the rs414171TT genotype had significantly increased IL-12p40 and IL-10 production.

Conclusions: CISH promoter rs414171 and rs809451 polymorphism may play a vital role in mediating individual susceptibility to tuberculosis.

ESPID-1058

CLINICAL IMPLICATIONS OF SERUM VANCOMYCIN CONCENTRATIONS AMONG CHILDREN WITH MRSA BACTEREMIA

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Introduction: While effective serum vancomycin concentrations (SVCs) are defined for adults with methicillin-resistant *Staphylococcus aureus* (MRSA) infections, data is lacking in pediatrics.

Objectives: Investigate relationships between SVCs and outcomes among children with MRSA bacteremia.
Aims: Identify differences in trough and/or AUC:MIC between treatment successes and failures

Methods: Retrospective cohort of children >1 month old who received at least 48 hours of vancomycin for MRSA bacteremia between 2002-2013. Treatment failure defined as ≥6 days to eradication, MRSA re-infection or mortality within 30 days of treatment.

Results: 112 patients were included, 42 of who failed treatment. Failures more commonly had deep-seated MRSA infections than successes (52% vs. 33%, p=0.041) and were older (mean±SD: 4.9±5.4 vs. 3.6±4.3 years, p=0.20) and heavier (mean±SD: 22.6±22.7 vs. 15.7±12.9 kg). Initial trough SVCs were slightly lower among failures than successes (mean±SD: 7.3±4 vs. 7.4±3.7 mg/L, p=0.018). When available, initial AUC:MIC was similar between failures and successes (mean±SD: 417.4964.5, n=27 vs. 332.3683.9, n=51; p=0.329). Most (78.6% of failures and 65.7% of successes, p=0.148) had vancomycin minimum inhibitory concentrations of 2 mg/L (Microscan®). A non-significantly greater proportion of treatment failures attained trough SVC ≥15 mg/L (31% vs 20%, p=0.19), and serum creatinine elevations 50% above baseline were more common when trough SVCs were ≥15 mg/L (n=8, 29.6%) than <15 mg/L (n=6, 7.1%), p=0.002.

Conclusions: No significant differences were found between vancomycin trough or AUC:MIC and outcomes among children with MRSA bacteremia. Given variability in AUC:MIC, larger studies are warranted to evaluate relationships between AUC:MIC and outcome.

ESPID-1059

RS2243268 AND RS2243274 OF INTERLEUKIN-4 (IL-4) GENE ARE ASSOCIATED WITH REDUCED RISK FOR EXTRAPULMONARY AND SEVERE TUBERCULOSIS IN CHINESE HAN CHILDREN

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Introduction:
Interleukin-4 (IL-4) and IL-10, which are produced by Th2 cells, serve as anti-inflammatory cytokines in the immune responses to tuberculosis (TB).
Objectives and Aims:
We want to investigate the association between susceptibility to TB and single-nucleotide polymorphisms (SNPs) of the *IL-4* and *IL-10* genes.
Methods:
A case-control study including 346 TB patients and 374 healthy controls was performed in Chinese Han children in North China.
Results:
Though no significant differences in the allelic and genotypic distributions of SNPs of these two genes were observed between control group and TB group, rs2243268 and rs2243274 of the *IL-4* gene were associated with reduced risk of developing extrapulmonary tuberculosis (EPTB) ($P_{rs2243268} = 0.005$ and $P_{rs2243274} = 0.004$) and severe TB ($P_{rs2243268} = 0.003$ and $P_{rs2243274} = 0.003$). The haplotype comprising rs2243268C and rs2243274A was found to be a resistance factor against EPTB and severe TB. In addition, after stimulation with inactivated H37Rv, blood samples of the rs2243268 AA+AC carriers showed significantly reduced IL-10 production ($P = 0.045$) and increased IL-17A production ($P = 0.685$) than CC carriers.
Conclusions:
In conclusion, rs2243268 and rs2243274 of the *IL-4* gene were found to confer resistance to EPTB and severe TB in Chinese Han children.

ESPID-1062

STAPHYLOCOCCUS AUREUS INFECTION AND IN VIVO EFFECTS OF SELENIUM SUPPLEMENTATION ON IMMUNITY AND INFLAMMATION

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Introduction: *Staphylococcus aureus* is one of the most frequently isolated pathogen that often causes severe nosocomial infections in pediatric patients.

Objectives: To study the impact of selenium on the *in vivo* immune response to infection by *Staphylococcus aureus*.

Aims: To show the immunomodulatory role of selenium during infection with *Staphylococcus aureus*.

Methods: A cross sectional study was performed on four groups of male golden Syrian Hamsters, supplemented (Se+) or not (Se-) with selenium and infected (SA+) or not (SA-) by *Staphylococcus aureus*.

Results: Serum levels of NO were decreased in Hamsters SA+/Se- compared with normal controls, and were significantly decreased in Hamsters SA+/Se+ when compared to Hamsters SA+/Se-. Furthermore, the levels of viable lymphocytes were significantly decreased in Hamsters SA+/Se+ compared to controls. However, the levels of apoptotic lymphocytes were significantly higher in Hamsters SA+/Se+ than in Hamsters SA+/Se-.

Conclusions: Selenium supplementation accelerates immune and inflammatory responses to *Staphylococcus aureus* infection.

ESPID-1063

MORTALITY AND RESISTANCE OF CANDIDEMIA IN A PEDIATRIC HOSPITAL IN SOUTHERN BRAZIL

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INTRODUCTION: Among hospitalized children, mortality due to Candida infections varies between 19% and 44%. We investigated the clinical and epidemiological characteristics of cases of bloodstream infection by *Candida* species and its associated mortality in a pediatric hospital.

METHODS: Analysis of medical records of 65 children admitted between September/2008 and September/2011 who had positive blood culture for any Candida species.

RESULTS: The mean age was 3.3 years (range=0-15.7, median=1.5 years) and 57% were male. Age and gender were not related to mortality. The overall prevalence of candidemia cases was 0.23 per 1000 patient/day, with a mortality rate of 32% (21 deaths). Among pathological conditions prior to candidemia, only renal failure was associated with higher mortality. Among acute risk factors, mechanical ventilation and dialysis, with or without other factors analyzed, showed association with mortality. Antifungigrama was performed on 55 samples using fluconazole, anfotericinaB, anidulafungin and micafungin. We found a dose-dependent susceptibility to fluconazole in 5 cases (2 *C.glabrata* and 3 *C.haemulonii*). Just a sample of *C.glabrata* was resistant to fluconazole. No resistance was identified for amphotericin B. There was an increased mortality in the group of patients with positive blood culture within 30 days after candidemia, regardless the result was positive for *Candida* or bacteria. The duration of treatment should be over a period of 14 days after the first negative blood culture results.

CONCLUSION: We confirmed the importance of performing a blood culture control every 72hours after the diagnosis of Candidemia until two consecutive test results are negative for this fungi.

ESPID-1064

VORICONAZOLE-RELATED SKELETAL FLUOROSIS IN CHILDREN

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Introduction. Voriconazole has been found to induce skeletal fluorosis in adult patients; however, little is known about this adverse reaction in children. We report the development of voriconazole-related skeletal fluorosis in two children with invasive fungal infections.

Objective. To define the clinical course and radiological manifestations of voriconazole-related fluorosis in children

Methods. Retrospective chart review.

Results. The first patient is a 5-year-old female with aplastic anemia with fungal pneumonia developed painful periostitis and exostoses of the clavicles and femurs with concurrent elevated serum fluoride levels (0.34 mg/L (normal <0.2 mg/ml)) following prolonged voriconazole therapy. Symptoms and radiological changes normalized over 6 months following withdrawal of voriconazole. The second patient is a 6½-year-old male with aplastic anemia developed bilateral lower extremity pain that limited his ability to walk, run, and ascend stairs. Radiologic imaging of all extremities demonstrated prominent bilateral periosteal new bone formation. Serum alkaline phosphatase levels became elevated (500-1200 U/L) in association with these changes. Vitamin A (49 ?g/dL) and vitamin D 25-OH (31 ng/mL) serum levels were normal. Pain and radiologic changes resolved over 3 months following discontinuation of voriconazole.

Conclusions. Prolonged exposure to voriconazole in pediatric patients may lead to painful skeletal fluorosis, periostitis, and exostoses that are reversible with discontinuation of voriconazole.

ESPID-1065

CATHETER-RELATED BREVIBACTERIUM CASEI BLOODSTREAM INFECTION IN A CHILD WITH ACUTE LEUKEMIA

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Introduction

Brevibacterium spp. are catalase-positive, non-spore- forming, non motile, aerobic gram-positive rods. It had been rarely reported as a cause of catheter related bloodstream infection (CRBSI) also it was considered apothegenic until a few reports of infections in immunocompromised patients were published. It was the first case of B.casei CRBSI in a child with acute leukemia.

Case Report

A 6-year-old boy with B-cell acute leukemia admitted to our hospital complaining of small grouped maculopapular lesions on an erythematous base. He hospitalized and intravenous acyclovir was started for herpes zoster infection. He developed fever on the fifth day of hopitalization and his hemogram revealed pancytopenia, he was given piperasilin-tazobactam(225mg/kg/day) empirically according to febrile neutropenia guidelines. Fever persisted for 96 hours despite broad-spectrum antibiotherapy, he was evaluated for fungal infection. He received vankomisin and fever resolved 24 hours later.
Growth of *B.Casei* was reported in blood and catheter cutures. Catheter was not removed because of ongoing chemotherapy, no recurrence occurred while receiving chemotherapy for six months period.

Conclusion

Patients with indwelling central venous catheters are at high risk of acquiring bloodstream infections. Among these, *Brevibacterium* spp. are rarely found and can be confused with apathogenic corynebacteria, physicians treating patients with sitotoxic chemotherapy regimens should be aware of this bacterial genus as a potential cause of invasive infection.

ESPID-1066

A RARE INFECTION: SPINAL INTRADURAL ABSCESS IN A PEDIATRIC PATIENT

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A 2-year-old previously healthy girl who presented with fever for 7 days despite antbiotic treatment for upper respiratory infection. She had history of falling from nearly 3 meters 10 days before. On examination, the patient showed no spinal deformity or dermal sinus. Neurological examination revealed a cooperative child with normal findings. Cerebellar signs were negative and signs of meningeal irritation were positive. Fundus exam was normal. Motor examination revealed movement restriction in left lower limb and power was 5/5 at both knee joints. Deep tendon reflexes were normally elicitable. Babinski reflex was bilaterally negative. Investigations showed normal chest and cranial tomography and urinalysis examination. Leucosytosiswas present and CRP was 31,9 mg/dL. Lumbar puncture was performed but cerebrospinal fluid (CSF) was thick, because of the small amount biochemistry was not studied. Methicillin-sensitive Staphylococcus aureus was the responsible pathogen isolated at CSF culture. Antibiotic treatment was performed. On the first week of follow-up neurological deterioration, reduction of deep tendon reflexes in lower limb and fever persisted. CSF examination showed glucose: 24mg/dL and very high protein levels. Antibiotic treatment has been changed. Spinal MRI showed spinal abscess in the posterior C7-L4 vertebrae level, along the dural sac which was drained. Subsequently, the patient was treated with surgery and antibiotics for 3 weeks. The patient showed marked improvement in all symptoms within 1 week of surgery. At discharge, 4 weeks post surgery, the patient had normal neurologic examination. The diagnosis of posttraumatic spinal abscess was made.

ESPID-1067
EFFUSIONS, CONFUSION AND EMPYEMA
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The rates of parapneumonic effusion have been increasing in Europe and the USA over recent years, and it is now encountered in approximately 40% of all patients with bacterial pneumonias. In most cases of empyema, fluid volume is minimal and the fluid is not contaminated and contains only marginal amounts of fibrin and cells. However, in the presence of bacteria (about 20-30% of cases) fluid volume tends to increase and its composition changes, with progression to the fibrinopurulent and organisation phase. The aim of treating parapneumonic effusion is to sterilise the pleural fluid and restore normal lung function. The choice of antibiotic is different in developing and developed countries. In the developed world, because *Streptococcus pneumoniae* is the most frequent cause of empyema, primary therapy is based on high intravenous doses of an antibiotic capable of assuring good pneumococcal coverage. The duration of administration has not been codified, but most authors suggest intravenous therapy for a week after the resolution of fever, followed by oral therapy for a further 1-4 weeks. Regardless of age, the drainage of pleural fluid is not indicated unless its ultrasonographically detected volume exceeds 1 cm. If the volume is higher, drainage is useful in order to confirm the diagnosis by excluding other causes of pleural effusion, define the quality of the fluid, identify the infecting organism and reduce respiratory symptoms, thus accelerating disease resolution. Theoretically, the fluid can be drained in four ways: thoracocentesis, by means of a chest tube (with or without fibrinolysis), or surgical debridement. A single tap can be used when ultrasounds indicate that fluid volume marginally exceeds 1 cm and lateral decubitus radiography shows that it is freely flowing in the pleural space, but when the volume is greater or the fluid becomes loculated, it is necessary to use repeated taps or insert a drain. Although non-randomised studies have shown that the two procedures are comparable, many authors prefer drain insertion because repeated punctures are more traumatic. Fibrinolytic medication is advocated when the pleural fluid becomes organised. However, the efficacy of fibrinolytics is debated and the most recent data seem to suggest that they do not significantly reduce the duration of fever, chest tube drainage or hospitalisation, and that surgery may still be necessary regardless of the stage of the disease. On the basis of these data, it seems that the step-wise algorithm for pleural empyema suggested by Proesmans and De Boeck can be considered acceptable. This considers antibiotics alone whenever pleural fluid volume is <1 cm; if this is not the case, intercostal tube drainage should be used, with the addition of fibrinolytics when the fluid seems to be organised. Video-assisted thoracoscopic surgery (VATS) is only considered as a salvage procedure in the case that the previous therapies fail. Finally, children with parapneumonic effusion should be carefully observed for signs and symptoms of hemodynamic deterioration due to pericardial effusion. Although the amount of pericardial fluid is usually very small and does not give rise to symptoms, pericardiocentesis is sometimes needed.;

ESPID-1073

UTILITY OF INFLAMMATORY MARKERS IN PREDICTING THE AETIOLOGY OF PNEUMONIA IN CHILDREN

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Background: Prediction of the causative pathogens of pneumonia in children could assist targeted management and facilitate appropriate antibiotic selection.

Aims: To investigate the diagnostic value of applying cut-off levels of inflammatory markers and to develop a prediction model for differentiation between bacterial and viral infections in pneumonia based on C-reactive protein (CRP), neutrophil and white cell counts (WCC).

Methods: Data analysis from prospective aetiological studies in 2001–2002 and 2009–2011 of children aged ≤16 years with radiologically-confirmed pneumonia. Discriminant analysis based on age and inflammatory markers (CRP, WCC and neutrophil count) was used to select the best combination for predicting bacterial infections.

Results: Among 401 children, those with bacterial pneumonia were older than those with viral pneumonia ($p<0.001$). Compared to viral, bacterial infections had a higher mean level of CRP ($p<0.001$), whereas WCC and neutrophil count were not different. Bacterial infections were associated with higher levels of CRP >80 mg/L than viral infections ($p=0.000004$), but levels <20 mg/L were not discriminatory ($p=0.254$). Neutrophil count $>10x10^9$/L was associated with bacterial than viral pneumonia ($p=0.012$) whereas WCC $>15x10^9$/L did not ($p=0.320$). Receiver operating characteristic (ROC) curve of the model for differentiating bacterial from viral pneumonia based on age, CRP and neutrophil count produced the best area under the curve of 0.894 with 75.7% sensitivity and 89.4% specificity.

Conclusion: This aetiological discriminant prediction model is a potentially useful tool in clinical management and epidemiological studies of paediatric pneumonia.

ESPID-1074

CHRONIC HEPATITIS E IN A CHILD AFTER KIDNEY TRANSPLANTATION

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Introduction: Transient asymptomatic hepatitis E virus (HEV) infection is common among healthy adults, as reported by blood transfusion services in Western Europe. In immune suppressed patients HEV infection may become chronic and lead to cirrhosis.

Objectives and Results: An 8-year old boy underwent renal transplantation in 2008, at the age of 4. Medication included prednisolone, mycophenolate mofetil (MMF), and tacrolimus. In the 3rd year after transplantation a routine check showed increasing liver enzymes (ALAT 94U/L, ASAT 55 U/L). They remained elevated with fluctuations (ALAT average 95 U/L, range 25-255 U/L). Common hepatotropic viruses (CMV, EBV, HAV, HBV, HCV) were ruled out. In 2013 a PCR for HEV-RNA was positive. Retrospective testing of archived plasma samples showed that the appearance of HEV RNA coincided with the elevation of liver enzymes; followed by the appearance of HEV antibodies. The HEV viral load fluctuated between 60 and 3100 IU HEV RNA /mL.

The MMF dosage was reduced (800 to 600 mg/m^2), followed by tacrolimus (0.1 to 0.05 mg/kg/day). HEV infection cleared rapidly and the liver enzymes normalized. HEV RNA in follow-up samples remained undetectable after restoring the medication.

Conclusions: Transplant recipients are at risk for chronic HEV, which may be mistaken for drug induced liver injury. It can be treated with ribavirine or by decreasing the immunosuppressive medication. Patients with unexplained signs of hepatitis, HEV infection must be considered. HEV serology is less reliable, to confirm or exclude HEV infection. PCR for HEV RNA must be performed on a fresh plasma sample.

ESPID-1075

DOES TETANUS-DIPHTHERIA-ACELLULAR PERTUSSIS MATERNAL IMMUNIZATION PROVIDE PERTUSSIS PASSIVE ANTIBODY PROTECTION TO THE INFANT ? FINDINGS FROM A PROSPECTIVE STUDY

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Background: The CDC recommends immunization of pregnant women with tetanus-diphtheria-acellular pertussis (Tdap), preferably at 27-36 weeks gestation (WG). This recommendation is based primarily on women vaccinated pre-pregnancy or cases in which the Tdap timing of administration to the pregnant woman was unknown.

Aim: To study whether late gestational Tdap immunization provides trans-placental pertussis toxin (PT) and filamentous hemagglutinin (FHA) antibody protection during the early vulnerable month(s) of life.

Methods: Women with infants ≥ 36 WG who received Tdap after the 20th WG were recruited; unvaccinated women during the current pregnancy were the controls.

Results: Infants of unvaccinated women (n=17) did not have protective GMC of PT (> 5 IU/mL) and FHA (> 50 IU/mL) to IgG, whereas infants of vaccinated women (n=33) were expected to achieve a longer-lasting protection, 79 ($p<0.001$) and 82 days ($p<0.001$), extrapolated from 36 and 40 days half-life, respectively (Figure 1A, 1B). The extrapolated protection for infants of mothers immunized during 27-36 WG (n=26) was 80 and 88 days, for PT and FHA, respectively, (Figure 1A, 1B).

The highest proportion of infants whose PT levels remained above protective levels for 108 days were those of women vaccinated between 27-36 WG when compared to infants of unvaccinated women, 14/26 (53.8%) vs. 2/17 (11.8%), respectively, $p=0.02$.

Conclusion: This first prospective study lends support to the current CDC recommendation for Tdap vaccination at 27-36 WG to confer passive protection prior to the initiation of the infant's primary vaccine series.

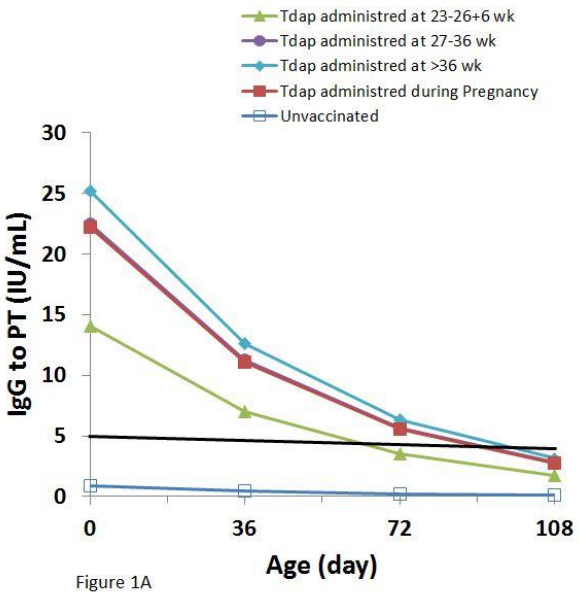

Figure 1A

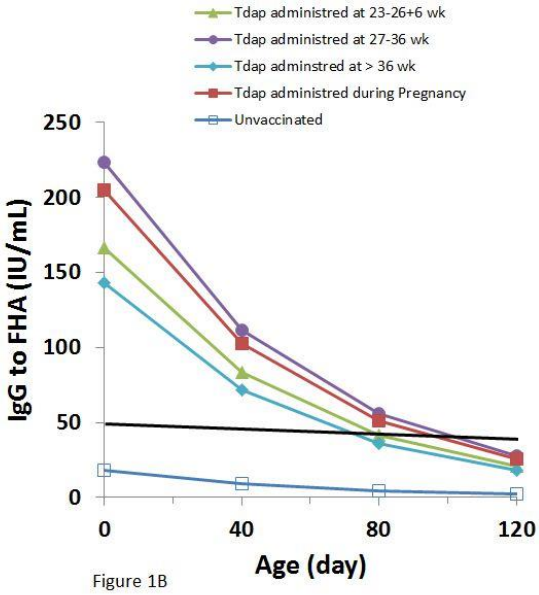

Figure 1B

ESPID-1076

SOME ASPECTS OF MOLECULAR EPIDEMIOLOGY OF CAMPYLOBACTERIOSIS IN CHILDREN

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The aim of the study was to use PCR-genoidentification method to determine for epidemiological investigation of differences inside dominating in Ukraine serovar C.jejuni Lio 32.

30 strains of Campylobacteria isolated from young children with illness and hens were studied.Prior to the testing the strains were cultivated for 48 hours on ferrum-erytryt agar in microaerophylic gas produced by native gasgenerating packets.Campylobacteria were serotyped according to international scheme of H.Lior.Genoidentification of Campylobacter genus bacteria has been made on the base of PCR with using universal oligonucleotide primers-REP(repetitive extragenic palindrome sequences).REP1 and REP2 universal primers were used .The tests were carried out in native amplifier in 35 µl volumes for 3,5 hours.The reaction products were analyzed by electrophoresis test in 1,2% agar gel.

The study revealed that the major product of 600 pairs of nucleotides (n.p.) was indicative of C. jejuni species of Campylobacteria.For C.coli the major PCR product of 1200 n.p. was typical.The differences inside in the dominating in Ukraine serovar C.jejuni Lio 32 by the minor fragments are identified and this fact allows to divide into five groups of PCR types .The first included the following fragments(n.p.):1500,1400,1300,700,500,250;the second-1400,900,800,500,250;the third-1600,1300,900,800,250;the fourth-1600,1500,850,250;the fifth-1500,1400,1300,800,250.

We have found that PCR genotyping with universal REP-primers can be used as an expert test for species of Campylobacter genus bacteria.Division of serovar C.jejuni Lio 32 into 5 PCR-types will facilitate epidemiological analysis of campylobacteriosis outbreaks.Strains isolated from young children with campylobacter illness and hens belonged to one group of PCR-types.

ESPID-1077

PREVENTING MOTHER TO CHILD TRANSMISSION OF HIV PAEDIATRIC AUDIT CYCLES BETWEEN 2004 – 2013

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Introduction: Between 1990 – December 2013 a total of 17,915 children were reported to be born to HIV positive mothers to the National Study of HIV in Pregnancy and Childhood (NSHPC). [1]

Aims: This audit was undertaken firstly to look at the performance of a local regional Paediatric team over a 9 year period and secondly to estimate the impact of significant service changes against the respective valid BHIVA Pregnancy Guideline.

Methods : Four cycles of retrospective case note audit of all babies exposed to HIV in a large Regional Centre were performed using identical updated standard proforma.

Results

	2004-2005	2008	2010	2011	2013
Number included	57	30	24	34	28 **
Maternal VL< 40 copies/ml before delivery	75%	76.7%	89%	97%	92%
Baby's sample at birth documented?	49%	75%	96%	85%	92%
Care Plan filed?	26%	85%	100%	85%	61%
Transmission Rate *	1.7% (N=1)	0%	0%	0%	0%

** Two confirmed detectable PCR at the age of 6 weeks and 3 months*
*** 5 Notes not available*

Discussion: In line with the data from NSHPC we have also seen a higher proportion of mothers diagnosed before conception and a decreasing delivery rate of babies exposed to HIV in 2013. Most of the significant outcome measures have improved over the audit period. As the care of HIV in Pregnancy requires a multidisciplinary approach the improvements have to be attributed to the joint effort of the whole team involved.

Reference

[1] *National Study of HIV in Pregnancy and Childhood http://www.ucl.ac.uk/silva/nshpc*

ESPID-1078

PATTERN OF VIRAL INFECTION AMONG INFANTS AND CHILDREN ADMITTED TO PEDIATRIC INTENSIVE CARE UNIT IN SQUH, OMAN

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Introduction:
Viral infections appear to be a significant cause of morbidity and mortality among critically ill infants and children, especially immunodeficiency patients. The burden of viral infections varies according to the type of virus and the clinical risk factors.

Objective:
To describe the pattern of viral infections in infants and children admitted to Pediatric Intensive Care Unit in Oman.

Methods:
Based on a retrospective review of the records between January 2011 and December 2012, a multiplex polymerase chain reaction for viral detection was performed on nasopharyngeal aspirates, tracheal aspirate, plasma, stool and urine sample.

Results:
A total of 373 infants and children were admitted to PICU during period of study. Viruses were detected in 34 of them from systemic (n=24, 70.6%) and respiratory (n=10, 29.5%) samples. The commonest is cytomegalovirus CMV 10 (29.4%), predominantly in immune compromised (n=8, P=0.023), and associated with increased mortality (n=5, P= 0.031), and prolonged PICU stay (n=7, P= 0.045). Dual or multiple viral infections were found in 5 cases (14.7%). Less than a quarter (n=8,23.5%) were discharged dead. The frequent risk factors for viral infection were age < 12 months (n=16, 47.1%), requirement of mechanical ventilation (n=18, 52.9%) and prolong stay (n=19, 55.9%).

Conclusion:
Our study determine that CMV is the most common virus among infants and children admitted to PICU in SQUH, and it's the common leading cause of mortality, followed by RSV, Rota virus and EBV. The Common risk factors are immunosuppression, requirement of mechanical ventilation and prolonged duration of PICU.

ESPID-1079

COST-EFFECTIVENESS OF CONJUGATE PNEUMOCOCCAL VACCINATION IN SLOVENIA

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BACKGROUND AND AIMS: The objective of the study was to analyze cost-effectiveness and feasibility of national immunization program with pneumococcal conjugate vaccine (PCV) in Slovenia.

METHODS: We applied a Markov decision model already described in several publications to the conditions of locally-specific population data, serotype incidence, and vaccine and treatment costs. Using recent clinical outcomes, we created vaccine efficacy estimates and compared two treatment options (PHiD-CV and PCV-13) with each other and with a »no vaccination« scenario from a payer perspective. We followed the cohort of 21,938 Slovenian infants over their lifetime. In base case, net indirect reduction of overall IPD was assumed 30% for both PHiD-CV and PCV-13.

RESULTS: Under conditions of 70% vaccine coverage and 2+1 dose regimen, vaccination with PHiD-CV dominated vaccination with PCV-13 at current price and price parity. At current price, PHiD-CV was cost saving vs »no vaccination«, while PCV-13 was not. Vaccination with PHiD-CV vs »no vaccination« allowed to save €71,368 and gain 76.7 QALYs at discount rates of 3.5%. Sensitivity analyses revealed robustness of the results and retained the dominance of PHiD-CV over PCV-13 as vaccination choice.

CONCLUSIONS: Results of our study suggest that the local healthcare authorities would save resources by implementing national immunization PCV program of infants. The dominance of »10-valent« over »13-valent« PCV can be explained by better efficacy of PHiD-CV against AOM due to its NTHi component and approximately same impact on IPD. As in Slovenian children incidence of AOM is high, this difference between vaccines becomes more apparent.

ESPID-1080

A STUDY ABOUT CASE DEFINITION OF INFLUENZA-LIKE ILLNESS IN FEBRILE CHILDREN WITH HIGHER ACCURACY

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Introduction: The case definition of influenza-like illness (ILI) doesn't fit well in children compared to adults because children with influenza illness have more diverse, nonspecific symptoms. This difference makes it more difficult to diagnose influenza illness in children.
Objectives: This study aims to identify clinical case definitions of influenza with higher accuracy in children using hospital-based surveillance system.
Methods: During 2011–2012 influenza season, informed consents, questionnaires, and respiratory specimens were obtained from children with fever presenting at emergency room in one tertiary hospital, located in Ansan city, South Korea. Rapid antigen test was done to all enrollees. Influenza was confirmed by reverse transcriptase-polymerase chain reaction. Symptoms, signs, and lab data were collected and multivariate logistic regression analyses was performed to identify clinical variables with better relation with laboratory confirmed influenza, and compared the accuracy of combinations.
Results: Total 1657 children were enrolled. Influenza was confirmed in 322. Mean age was significantly older in influenza group (3.8±3.2 years old vs. 2.5±2.8 in non-influenza group). The univariate analysis showed that the odd ratios of febrile sense, chilling, sputum, cough, sore throat, chest pain, rhinorrhea, abdominal pain, headache, myalgia were significantly higher in influenza group (range 1.55-6.78). The degree and duration of fever had no significant difference. In multivariate analysis, febrile sense, chilling, and cough showed significantly higher odd ratios in influenza group (range 1.89-4.69).
Conclusions: The more accurate case definition for ILI would improve the detection and management of children with influenza illness.

ESPID-1081

TRANSIENT SINUS BRADYCARDIA DURING THE COURSE OF CRIMEAN-CONGO HEMORRHAGIC FEVER IN CHILDREN

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Introduction: Crimean-Congo hemorrhagic fever (CCHF) is an acute tick-borne viral zoonotic disease which is endemic in Turkey. It remains unclear, whether bradycardia is associated with ribavirin treatment or the severity of CCHF.

Aims: The present study aimed to determine the clinical and laboratory characteristics of pediatric CCHF patients with and without bradycardia, the relationship between bradycardia and ribavirin treatment, and the relationship between bradycardia and disease severity.

Methods: Twenty six hospitalized CCHF patients were reviewed in terms of age, gender, history of tick bite, duration of hospitalization, presence of bradycardia, laboratory features, ribavirin therapy, and blood products requirement. Bradycardia was accepted as a heart rate 2 standard deviations (SDs) lower than the expected heart rate based on age. According to Swanepoel severity criteria, patients were classified into two groups in terms of disease severity as 'severe' and 'non-severe'.

Results: Twenty six patients (mean age was 126.42 ± 48.21 months, 8 female) were enrolled into the study. Bradycardia was noted in 15 patients (mean age was 120.20 ± 50.59 months, 5 female). All patients had sinus bradycardia. Ribavirin was administered 11 (61.1%) patients with bradycardia. There wasn't statistically significant relationship between bradycardia and ribavirin treatment also with disease severity (p= 0.683, p= 0.683).

Conclusion: Transient sinus bradycardia might occur during the clinical course of CCHF in pediatric patients. Although an association between bradycardia and disease severity was not observed in the present study, clinicians should be aware of this finding and all CCHF patients should be monitored closely.

ESPID-1082

VIRAL MENINGITIS OUTBREAK PECULIARITIES IN KAUNAS (LITHUANIA) IN 2013

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Background. Enteroviruses are the most common cause of viral meningitis in children.

Aim of the study was to analyze peculiarities of viral meningitis during the outbreak in 2013y.

Method. A retrospective analyzes of viral meningitis cases in children, hospitalized in Kaunas Clinical Hospital in June – October, 2013y.

Results. 204 cases of viral meningitis (63,3% of all registered cases in Lithuania in mentioned period) were analyzed. Children aged 2 - 17 years (9,9±4,4y); mostly boys - 61,3% (n=125). They were admitted to the hospital from the first to 10th day of the disease (mean 2.45±1.4d). All patients suffered from headache and fever 38.15±0.7ºC, lasting in average for 1.87±1.2d. 88% of patients had nuchal rigidity, 24,5% - Brudzinski's and 32,8% Kernig's sign. Focal findings were seen in 16,3% of cases. Lumbar puncture was done on average 2.8±1.6d of the disease to all patients. CSF findings include pleocytosis from 5 to $1080x10^6$/l (mean $143.63±146.4x10^6$/l) predominant mononuclears 64,1%, protein from 0.1 to 1.28 g/l (mean 0.31±0.21 g/l), normal or slightly low glucose (mean 2.97±0.43 mmol/l). CSF findings did not depend statistically significant on the day of LP. Low correlation between higher fever and number of cells (Spearman's Rho=0,198, p=0,005), higher CRP and number of cells (Spearman's Rho=0,202, p=0,005) were found. Mean CRP value was 9,3±10,6 mg/l. The mean duration of hospitalization was 5.5±1.7d. Prognosis for all children was good. Echovirus 30 serotype was identified (5 cases from 6 verified).

Conclusions. Cases of children viral meningitis were typical and without complications. Echovirus serotype 30 was identified.

ESPID-1085

RISK FACTORS FOR NOSOCOMIAL COLONIZATION OF CARBAPENEM RESISTANT GRAM NEGATIVE BACILLI IN PEDIATRIC UNITS

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Background: This study examined risk factors for nosocomial colonization due to carbapenem resistant gram negative bacilli (CR-GNB) in pediatric units during the hospital-wide outbreak.

Methods: A retrospective case-control study was performed at Marmara University Hospital.

Results: Total of 1840 rectal swab specimens were collected from all 762 hospitalized patients. Among them 194 (25%) patients were colonized with CR-GNB. Of them 76 (10%) patients were colonized with carbapenem resistant Enterobactericeae (CRE), 139 (18%) were colonized with CR-nonfermenter (CR-NF) and 21 (3%) patients were colonized with both. Control group consisted noncolonized patients. The median time for colonization with CR-GNB, CRE and CR-NF were 13 (0-116), 16 (0-116) and 12 (0-106) days, respectively. Duration of rectal colonization with CR-GNB, CRE and CR-NF were 14 (0-160), 21 (0-160) and 13 (0-160) days, respectively. Independent risk factors for CR-GNB colonization were age under 1 year (odds ratio [OR]:2.2, p=0.003), nasogastric tube placement (OR:5.88, p=0.0001), having a chronic disease (OR:2.35, p=0.001) and carbapenem use (OR:2.38, p=0.003). Independent risk factors for CRE colonization were having a chronic disease (OR:4.38, p=0.0001), carbapenem use (OR:3.27, p=0.001), urinary catheterization (OR:3.4, p=0.001) and nasogastric tube placement (OR:5.98, p=0.0001). Independent risk factors for CR-NF colonization were having a chronic disease (OR:2.0, p=0.001), nasogastric tube placement (OR:5.9, p=0,0001), age under 1 year (OR:1.91, p=0.003) and being in an intensive unit (OR:1.91, p=0.005).

Conclusion: This study reveales a high frequency of rectal colonization with CR-GNB in pediatric units. Antibiotic stewardship programs should be implemented for control.

ESPID-1086

ATYPICAL PRESENTATIONS OF HERPES VIRUS ENCEPHALITIS: TWO CLINICAL CASES

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Neurological complications of Herpes Virus infections are well known in literature. We describe 2 cases of atypical encephalitis in previously healthy children.

2 years old girl admitted with a few-hours history of fever followed by lethargy, hypotonia, bilateral midriasis. Temperature was 40,6 °C, pulse rate 220/min, blood pressure 81/36 mmHg, pulse oximetry 75%. Physical examination confirmed only neurological alterations. Blood test revealed: WBC 6000/mm3, C Reactive Protein 36,6 mg/dl, Procalcitonine 8,7 ng/ml. Electroencephalogram detected diffuse slow activity. Antiviral therapy was started. Progression was rapid with onset of bradycardia, cardiorespiratory insufficiency and cardiac arrest. After stabilization, CT scan showed massive brain edema and ischemia. Due to clinical and radiological findings, lumbur puncture was not performed. The patient died in few hours. PCR revealed blood positivity for HHV7.

16 months old boy admitted with measles – like rash, irritability followed by lethargy started 3 days after resolution of 5 febrile days. Physical examination showed only skin rash. Blood test was perfectly normal. A lumbur puncture was performed. MRI and EEG were negative. PCR revealed blood and CSF fluid positivity for HHV6. 48 hours after admission the baby was completely recovered and was discharged in 3 days.

Our cases show that an atypical presentation could deceive:

- HHV6 and 7 encephalitis are usually associated to immunodeficiency; our patients were previously healthy

- Fatal HHV7 encephalitis in immunocompetent children is a not described event

- HHV6 skin rash usually appeares in 24 hours after fever resolution; in our case the rash developed after 3 days

ESPID-1088

SUCCESSFUL TREATMENT OF ASPERGILLUS VENTRICULITIS THROUGH VORICONAZOLE ADAPTIVE PHARMACOTHERAPY AND THERAPEUTIC MONITORING OF CEREBROSPINAL FLUID (1->3)-BETA-D-GLUCAN CONCENTRATIONS

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Introduction**.** Aspergillus ventriculitis is an uncommon but uniformly fatal form of aspergillosis of the central nervous system (CNS).

Objective. To report the strategies used to successfully treat Aspergillus ventriculitis with emphasis on the critical role of adaptive pharmacotherapy of voriconazole and serial monitoring of (1->3)-β-D-glucan cerebrospinal fluid (CSF).

Methods. Serial voriconazole levels by HPLC; (1->3)-β-D-glucan determinations.

Results**.** A 16 year-old male with pituitary and pineal germinoma developed biopsy-proven *Aspergillus fumigatus* ventriculitis. Magnetic resonance imaging demonstrated an intraventricular abscess and several foci along the meningeal surfaces of the brain and spinal cord, consistent with seeding from the ventricle.

He was treated initially with voriconazole (MIC=0.25mg/ml) and caspofungin (MIC=0.25mg/ml). An adaptive pharmacotherapeutic algorithm was used to attain target plasma voriconazole AUCs of ≥40,000 ng·h/ml, resulting in steady-state CSF levels of 1.1 mg/ml to 2.2 mg/ml, which exceeded the MIC by ≥4x. These plasma and CSF levels of voriconazole were associated with a simultaneous decrease in CSF (1->3)-β-D-glucan from a maximum level of 1,575pg/ml to ultimately being undetectable at <31pg/ml over the course of almost 2 years of therapy in association with resolution of fever and headache as well as decreased CSF white blood cell count from a peak of 1,233 to 0 cells/ml. The patient has now been in remission of his germinoma and aspergillosis for more than two years, is currently ambulatory and attends school.

Conclusions. Aspergillus ventriculitis, a highly lethal form of aspergillosis, can be successfully treated with combination antifungal therapy, voriconazole adaptive pharmacotherapy, and serial monitoring of CSF (1->3)-β-D-glucan.

ESPID-1089

CHRONIC HEPATITIS B IN CHILDREN AND ADOLESCENTS: A LONGITUDINAL ASSESSMENT

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Introduction Chronic Hepatitis B in children is a problem all over the world; paediatric data are limited.

Material and methods The authors describe clinical, biochemical, virological and imaging data of a cohort of paediatric patients with chronic Hepatitis B infection who attended the Paediatric Infection Disease Unit of Luigi Sacco Hospital, University of Milan.

Results We followed 13 children and adolescents, all of whom were vertically-infected. Every 6 months patients underwent laboratory assessment (blood count, AST, ALT, bilirubin, alkaline phosphatise, protein electrophoresis) and virological examination (HBV-DNA, HBsAg, HBsAb, HBeAg, HBeAb, HBcAb IgM). Serum IgA, IgM, IgG, lipid profile, coagulation assessment, ferritin, alfa-phetoprotein were tested once a year.

Liver ultrasound examination using Esoate Mylab50 and transient elastography using FibroScan ® was performed once a year. Eleven children out of thirteen were HBeAg positive; only one patient was anti-HBeAg positive. AST and ALT values were elevated in 7/13 and 5/13 respectively (median values were: ALT 92 UI/mL, AST 63 UI/mL).

During the follow-up 2 patients (15%) seroconverted to anti-HBeAg. The most common picture at hepatic ultrasound was grade I steatosis and 2 children showed mild hepatomegaly. The transient elastography evaluation, performed in 7 cases, showed mild increment of liver stiffness values in all cases. The median stiffness was 5.2 KPa (range 4.6 to 6.8).

Discussion. The decision about when and how start antiviral therapy in children is still a controversial issue; however an early treatment would have the purpose to reduce viral replication and infectivity, and prevent long-term complications.

ESPID-1090

"A PERSISTING ELBOW PAIN..." – CLINICAL CASE

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ABSTRACT

The extra-pulmonary manifestations of TB in children and adolescents occur in about 25% of the cases. The most frequent locations are ganglionic, pleural, osteo-articular and meninges with very few cases describe in the literacy of TB of soft tissues.

Clinical Case: We present a case of a female adolescent, 17 years old; healthy that presents pain in the right elbow, without inflammatory signs or trauma history.

The patient was examined in the urgency by orthopedics and did not present any alterations in the x-ray and was medicated with anti-inflammatory.

Due to persisting pay and appearing of inflammatory signs locally she was examined again and did another elbow x-ray revealing " edema and cellulitis; lesion of 30x7 mm. No evidence of bursitis or rupture." She started antibiotic therapy with antibiotic orally without improvement of the clinic and was observed again by orthopedics. She presented a painful tumefaction in the external face of the elbow with fluctuation signs but with preserved mobility. She was admitted in hospital for additional study and it was performed a local biopsy and new antibiotic ev (14 days) with persisting clinic. From the investigation study we highlight microbiological study of the biopsied sample in Middlebrook 7H9 e Lowenstein Jensen positive for *Mycobacterium Tuberculosis.* Mantoux was negative.

MR T2 coronal view of right elbow " extensive liquid collection centered in the cutaneous fat compatible with infectious lesion of tuberculosis etiology".

The patient started therapy with isoniazid, rifampicin and pyrazinamide with positive clinical improvement after 1 month.

ESPID-1092

A CASE OF CONGENITAL TUBERCULOSIS

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Background

Congenital tuberculosis (TB) is rare and often fatal; it could be associated with tuberculous endometritis or disseminated TB in mother.

Methods

Aysha was born by caesarean section at 29 gestational weeks, birth weight 1250 g, Apgar 8/9. After diagnosis of maternal tubercular lymphoadenopathy, Mantoux skin test and interferon-Gamma release assay (IGRA) were performed to the newborn; both resulted negative, as the research of BK in urine. On day 52nd Aysha started to have cough, desaturation crisis and tachycardia associated with reduction of murmur on right hemithorax. Antibiotic therapy with ampicillin and gentamicin was promptly started. The thorax X-ray showed consolidation of the right medium and upper pulmonary lobes. The abdomen ultrasonography was normal; the thorax CT showed atelectasis of the upper right lob and adenopathies, compatible with the diagnosis of TB. The Mantoux skin test resulted positive, as the IGRA test. The research of BK (microscopic, PCR and later cultural tests) resulted positive both in urine and in gastric aspirates. Antitubercular therapy with isoniazid (15 mg/kg/die), rifampicin (15 mg/kg/die) and pyrazinamide (30 mg/kg/die) was started. After 4 months pyrazinamide was suspended, while the therapy with isoniazid and rifampicin was continued for a total of 14 months. The therapy was well tolerated and the child grew adequately. The serial thorax X-rays showed a gradual improvement until the complete resolution.

Conclusions

Congenital tuberculosis is difficult to diagnose, but is often fatal. So prompt diagnosis and therapy are essential.

ESPID-1093

COMBINED IMMUNOPROPHYLAXIS OF ACUTE RESPIRATORY VIRAL INFECTIONS AND INFLUENZA FOR ASTHMA CONTROL IN CHILDREN

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Triggers of asthma exacerbation were studied in 128 children with incomplete asthma control. Acute viral respiratory infections (ARVI) were found to present a risk factor for asthma relapse in 75% cases (OR = 7.5; p <0.05).
Clinical and immunological efficacy of influenza and ribosomal immunization (RI) was analyzed in 56 children (average age 12.3 ± 3.8 years) with incomplete control of asthma triggered by ARVI.
Main group (n = 19) received influenza vaccination and RI, comparison group (n = 17) received only influenza vaccination, and control group (n = 20) did not get any immunization. We compared tolerability and immunological efficacy of influenza vaccination in children with asthma with the vaccinations' results of children without allergic diseases (external control group (n = 30)).
No differences were observed in tolerability, as well as in formation, intensity and duration of post-vaccination immunity to influenza in children with asthma compared to children without allergic diseases. Influenza vaccination and combined immunization stimulated the build-up of strong immunity to the influenza strains. After vaccination, level of anti-hemagglutinin to influenza vaccine strains and the life-time of protective concentration did not depend on the IL-4 initial concentration or method of immunization. RI induced normalization of IL-4 level, overproduced at baseline, and improvement of IL-4/IFN-γ ratio. Combined immunoprophylaxis in children with asthma triggered by ARVI, reduced the incidence of asthma relapses and recurrent infections and shortened their duration (p<0.05).
In 68.4% of children, influenza vaccination combined with RI allowed to control asthma at less intensive basic therapy (p<0.05).

ESPID-1094

THE COMPARATIVE BENEFIT OF VACCINATING GIRLS AND BOYS AGAINST HPV IN THE UK.

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BACKGROUND AND AIM:

The UK runs a successful human papillomavirus (HPV) vaccination programme for girls aged 12-13 years to protect them from cervical cancer (CC). This study summarises the potential direct benefit of the current programme on the prevention of all HPV related cancers, before considering what the direct benefit of vaccinating boys might be, albeit that neither vaccine has a marketing authorisation for the prevention of cancers in males.

METHODS:

A static population model was adapted to the UK, to estimate cancers directly prevented by HPV vaccination (i.e. CC, anal, vulvar, vaginal, oropharyngeal, penile) at vaccine steady-state (when the entire population has been vaccinated at age 12-13 years). Vaccine efficacy of the AS04-adjuvanted HVP-16/18 vaccine, irrespective of HPV type was assumed for all cancers. The fraction of cancers attributable to HPV infection and incident cancer cases were taken from the literature. Vaccination coverage in girls and boys was 86% (national average). Herd effects were not modelled.

RESULTS:

Without vaccination, 4,644 female cancer cases are attributable to HPV infection compared with 1,293 male cancer cases. Vaccination of girls is expected to prevent 3,748 cancer cases in women annually at steady-state, compared to vaccination of boys, which could prevent 1,043 cancer cases annually in men.

CONCLUSIONS:

The direct cancer protection from the girls HPV vaccination programme was estimated to be 3.6 times higher than that expected from a possible boys vaccination programme in the UK.

ESPID-1095

REVIEW OF ALL THE PATIENTS ADMITTED TO ACUTE MASTOIDITIS IN A PAEDIATRIC WARD FROM 2000 TO 2013

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INTRODUCTION. Acute mastoiditis is an important complication of acute otitis media, common disease of the first years of life.

METHODS. All clinical notes of patients admitted to acute mastoiditis from 2000 to 2013 has been reviewed.

RESULTS. Since 2000 to 2013, 74 patients were admitted to acute mastoiditis (56 male, 18 female, median age 6.17 years), representing 0.34% of yearly admissions rate and with an average hospital stay of 6.8 days. The most frequent signs/symptoms observed at onset were: ear pain (90.5%), high temperature (75.6%), retro-auricular hyperemia, pain and swelling (95.9%). Ceftriaxone was the antibiotic used with more frequency (89.2%) on average for 4,9 days, and then replaced with oral cefaclor, cefpodoxime proxetile or amoxicillin+clavulanate. Only one patient presented complications at discharge (right ear transmissive deficit). In two patients, during admission, incision and drainage of under-periosteal abscess was necessary. CT scan was used in 7 patients. Where performed, blood cultures were always negative; ear swabs, done in 13 patients, came positive in 9 of them (69.2%).

CONCLUSIONS. Although rare, acute mastoiditis is an important complications of acute otitis media. An accurate diagnosis and a prompt start of intravenous antibiotic is necessary to avoid severe complications.

ESPID-1096

IMMUNOGENICITY & INTRANASAL CHALLENGE STUDY OF GCC TDAP VACCINES AGAINST BORDETELLA PERTUSSIS IN A MURINE MODEL

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INTRODUCTION: In spite of well implemented infant pertussis vaccination rates, pertussis has remained endemic in many countries. Especially, an increasing number of cases have been reported in old persons. In this aspect, pertussis booster immunization using Tdap vaccines in older age groups should be needed. Also, the smoothness supply of Tdap vaccines will be required and the development of more immunogenic Tdap vaccine will be demanded.

OBJECTIVES: Primary objective is to confirm and compare the humoral and CMI of GCC Tdap vaccines, and secondary objective is to confirm the protective efficacy of Tdap vaccines using intranasal clearance in a murine model.

AIM: The aim of this study is to find out more effective GCC Tdap vaccines(being developed) before the human clinical phase I study.

METHODS: Three groups of 4 weeks old BALB/C 28 female mice were immunized by IP injection with DTaP vaccines(1/4 human dose), and received three different PRN dose GCC Tdap booster vaccination 6 weeks later. Humoral immunity and CMI were measured by ELISA. Intranasal clearance challenges were performed after booster.

RESULTS: Anti-PT, FHA, and PRN Abs. were well maintained, and markedly elevated after booster vaccination in all study groups. Also, Th1 CMI(IFN-r, IL-2) and Th2(IL-4,5,10) were elevated. But, there were no different between study groups. Pertussis were eradicated within 5 days after intranasal challenge in all study groups.

CONCLUSION: The GCC Tdap vaccines revealed immunogenic and protective against pertussis. But, high dose PRN Tdap vaccine was not more immunogenic. We need to develop new murine model with more discrimination capacity.

ESPID-1098

STREPTOCCOCUS PNEUMONIAE AS A CAUSE OF ACUTE OTITIS MEDIA IN SLOVAK CHILDREN IN PNEUMOCOCCAL VACCINATION ERA

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Introduction and Objectives: *S. pneumoniae* is a leading bacterial pathogen causing acute otitis media (AOM). There is significant decrease of pneumococcal AOM after widespread vaccination with pnemococcal conjugate vaccines (PCV) although the replacement phenomenon has been observed by non-vaccine pnemococcal serotypes. In study area vaccination status of newborns is various due to various PCV vaccine availability (Prevenar, Synflorix, Prevenar 13).

Aims and Methods: Goal of presenting study was to determinate AOM pathogens, detect antibiotic susceptibility and in case of *S.pneumoniae* performe serotyping by Quellung method. 233 patients in age 0-4 year were acquired from outpatient children with AOM. Middle-ear ?uid was obtained by tympanocentesis for bacteriological testing. Time period of study was from January 2012 till July 2013 (16 months).

Results: 233 children with AOM were enrolled to the study. Average age was 16 months and in 54% it was first episode of AOM. *S. pneumoniae*, 58 %, *H. influenza* 21%, *S. aureus* 16% *S. pyogenes* 11% and *M. catarrhalis* 4% were identified respectively. Serotyping manifested dominant role of serotype 19A 40,9%, serotype 3 21,2% and 19F 9,1% respectively although replacement phenomenon of non-vaccine serotypes increased dramatically (25,2 %).

Conclusions: *S. Pneumoniae,* despite widespread of PCV vaccination is most common pathogen of AOM with dominant role of multi-resistant serotype 19A and serotype 3. However these are additional serotypes in 13-valent vaccine, but vaccination status of 13-valcent vaccine was only 18% in study group compare to 43% 7-valent, 39% 10-valent vacciine. 15% of children haven't received any PCV vaccine.

ESPID-1099

IMMUNE ACTIVATION AND INFLAMMATION IN CHILDREN WITH HIV - MICROBIAL TRANSLOCATION OCCURS INDEPENDENTLY OF HIV VIRAL LOAD

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Introduction: Immune activation (IA) is associated with non-AIDS events and mortality in HIV-infected adults; to date little data exists in children.

Objectives and aims: To determine serum levels of soluble and cellular biomarkers of inflammation (D-Dimer (DD), beta2 microglobulin (b2mcg) and highly-sensitive C-reactive protein (hsCRP)) and IA (expression of HLA-DR^+ and $CD38^+$ on $CD4^+$ and $CD8^+$ T-cells) as well as biomarkers of microbial translocation MT (LPS, microbial 16s rDNA and sCD14) in HIV-infected and healthy children.

Methods: Cross-sectional study including HIV-infected children (n=54 with undetectable VL, n=23 with detectable VL and healthy controls (n=32).

Results: DD (p=0.002), b2mcg (p=0.036) and uCRP (p=0.037) were increased in HIV-infected children with or without detectable viremia compared to healthy controls as was the expression of HLA-DR^+ and $CD38^+$ on $CD4^+$ and $CD8^+$ T-cells (p=0.001). LPS (p<0.001), microbial 16s rDNA (p<0.001) and sCD14 serum levels (p<0.001) were increased in patients with HIV compared to healthy controls but was independent of viraemia. A positive correlation of microbial 16s rDNA and sCD14 was observed (p=0.02) (Figure 2).

Conclusions**:** 1. IA and inflammation occurs in HIV-infected children, especially in the setting of uncontrolled viremia. 2. MT occurs in patients with HIV independently of viral status. 3. There is a need to develop strategies to minimize/reduce MT in order to reduce the risk of non-AIDS events in HIV children.

Figure 1: Correlation of sCD14 and bacterial rDNA 16s

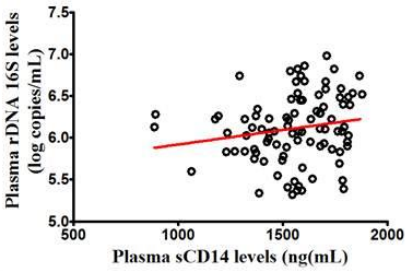

Figure 1: Correlation of sCD14 and bacterial rDNA 16s

ESPID-1100

ASSESSMENT OF ANTIBIORESISTANCE PATTERN IN CHILDREN WITH ACUTE RESPIRATORY TRACT INFECTION AND ALLERGY TO BETA- LACTAM ANTIBIOTICS

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Background and aims: Betalactams are often used with acute bacterian respiratory disease. When treatment with betalactams is contraindicated, the pediatrician should prescribe other classes of antibiotics.

Objectives: Assessment of antibioresistance pattern from nasopharyngeal secretions in symptomatic patients, βL allergic group compared to non-βL allergic group.

Methods: The study included 1121 children aged up to 5 years, ARI confirmed by throat/nasal swab. Patients were treated in the outpatient department of pediatrics/allergy in Dr V Babes Center Bucharest , from Jan to Dec 2013. The antibiotic susceptibility profiles were analyzed for Streptococcus pyogenes, Streptococcus pneumoniae and Haemophilus influenzae, using both Kirby Bauer test procedure and E test, for macrolides and betalactam antibiotics.

Results: 96 patients (8.6%) had history of immediate or late βL hypersensibility (7.5% penicillin, 1.1% penicillin and cephalosporin combined). The most common allergic symptom was itchy rash. Streptococcus pyogenyes resistance to ML was 43% in the βL allergic group, significantly higher compared to 12.9% in the non-βL allergic group. Streptococcus pneumoniae resistance to ML was 72.37% in the βL allergic group compared to 42.7% in the non-allergic group. Hemophilus influenzae resistance to ML was low, no difference between allergic/non-allergic group.

Conclusions: 1. The frequent use of ML in acute bacterial respiratory tract infection in children easily leads to increase of resistance, which is obvious in the βL-allergic children category.

2. Regional antibiotherapy guidelines should be used in current practice for empirical treatment, to prevent the excess use of macrolides and the rising of resistant strains.

ESPID-1101

CHANGES IN HUMORAL AND PHAGOCYTIC COMPONENTS OF THE IMMUNE SYSTEM IN CHILDREN OF VARIOUS AGES IN ACUTE INFECTIOUS MONONUCLEOSIS

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Objectives: To detect the characteristics of the immune response of children of various ages in acute infectious mononucleosis (IM).

Methods: The immunoassay of 34 children aged 4-17 years in the second week of IM was carried out. Patients were divided into 3 groups: I group aged 4-6 years, II – 7-12 years, III – 13-17 years.

Results: The humoral component of the immune system demonstrated the following changes: decrease in number of B-lymphocytes CD20+, most evident in III group (?<0.01). The level of CD23+ in I and II groups stayed within normal limits, whereas in III group a significant decrease in absolute index was determined (?<0.01). Performance of activated lymphocytes CD71+ displayed the following changes: in I group a significant increase in their concentration was detected (?<0.01), II group demonstrated an increase in their absolute number, and in III group the index stayed within normal limits. Immunoglobulin profile in I group conformed to performance standards, in II group there was an increased tendency of IgA level, and in III group this index had high significance level (?<0.01).

All age groups showed an increase in level of CIC 3, 5, 7 and activation of phagocytic component of the immune response in NBT-Test. At the same time in III group NBT was significantly higher (?<0.01).

Conclusion: On the basis of the findings, it can be induced that in all age groups IM leads to the development of one-way immune response of different degree of manifestation that probably depends on immune system maturity.

ESPID-1102

CLINICAL CHARACTERISTICS AND LABORATORY FINDINGS IN DANISH CHILDREN HOSPITALIZED WITH EPSTEIN-BARR VIRUS INFECTION

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Introduction and aims: Epstein-Barr virus (EBV) positive infectious mononucleosis (IM) is a common disease. The objective of this study was to describe the demographic, clinical, and laboratory features among children hospitalized with acute EBV infection compared to children with a negative EBV test result.

Methods: This study included data from medical records of 195 immunocompetent patients aged 0-16 years presenting with clinical features that prompted a laboratory test for EBV. Patients were hospitalized at the Department of Paediatrics, Hvidovre University Hospital, Copenhagen from 2002-2013. Patients were divided into an EBV-positive (N=95) and an EBV-negative (N=100) group according to the results of the heterophile antibody tests and/or EBV specific serology and PCR assay. Demographic variables, clinical manifestations, and laboratory findings were compared between the groups.

Results: The incidence of fatigue, tonsillitis, periorbital oedema, rhinorrhea, cervical and general lymphadenopathy, rash, and hepatosplenomegaly was significantly higher among the EBV-positive patients. The levels of white blood cells, lymphocytes, alanine aminotransferase, and lactate dehydrogenase were significantly higher in the EBV-positive group, while thrombocytes and neutrophil counts were significantly lower. A third of the EBV-positive children were below three years of age. No statistical significant difference was found regarding gender and age distribution, number of siblings, or ethnicity. Similarly, no clear seasonal variation in admissions was discovered.

Conclusions: This study provides a detailed description of the clinical and laboratory findings in Danish children hospitalized with acute EBV infection. EBV-associated IM is likely in febrile children with tonsillitis, lymphadenopathy, hepatosplenomegaly, fatigue, lymphocytosis and elevated liver enzymes.

ESPID-1104

THE IMPACT OF RESPIRATORY TRACT INFECTIONS IN GP'S PRACTICE OBSERVATIONAL STUDY 2008-2013.

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Introduction: High frequency of respiratory tract infections(RTI) in the age group 0-5 years in GP's practice, led to this observational retrospective study.
Aims: The study aimed to identify the causes responsible for increased frequency of RTI.
Objectives: 1.Quantification of RTI in children 0-5 years
2.Causality of RTI in our practice
3.Correlations between prevention, treatment, prognosis
Design and methods: Between 2008-2013, we had 69 882 consultations, children 0-5 years representing 48% of presentations.
42% of them have requested consult for RTI. 24% of this last group, develop severe RTI. Criteria to define severity for RTI: polipneea>40, high fever>39, intense headache, +/_ottorhea, PO2<96, blood sample:PCR, ESR>20 mm/h, nasal and throat culture.
We survey two groups of children-200 children vaccinated with Pneumoccocal vaccine and 200 children who doesn't get the pneumococcal vaccine.The both groups attending kindergarten starting age of 2.2(average).
Results.Discution.: Unvaccinated group:
We isolated :Streptoccocus Pneumoniae 24%,Staphylococcus Aureus 14%, Haemphilus 6%, Streptococcus B hemolitycus 6%, viruses:H1N1,VSR, Adenoviruses-7%
Str. Pneumoniae (24%) produce- 30% severe pneumonia, of which 63% associated otitis(from witch: 21%-purulent otitis, 7% develop hearing loss, 3% reach the final prosthesis).
70% of children attending kindergarten are healthy carriers for Str Pneumoniae
Antibiotics-82%
Vaccinated group:
-positive nasal culture for Str Pneumoniae-12%
- congestive otitis in 9%
-pneumonia with Str Pneumoniae -2%
Antibiotics-40%
Conclusions.Direction for action:: a. Information- correct mesages for parents about the risk of non vaccination and antibiotic abuse
b.Education –prevention =optimal treatment=quality of life, patient-doctor partnership
c.Protection- need for real extension of the National Imunization Program.

ESPID-1105

PROTEASE INHIBITOR MONOTHERAPY VS HIGHLY ACTIVE ANTIRETROVIRAL THERAPY: A STUDY OF PERSISTENT INFLAMMATION AND IMMUNE ACTIVATION

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Aims: Protease inhibitor monotherapy (mPI) is an effective and safe way of simplification in selected patients with HIV infection. We compare biomarkers of inflammation, microbacterial translocation (MT) and immune activation (IA) in children without infection (HIV-), HIV positive children without treatment (HIV+/No T), with highly active antiretroviral therapy (HIV+/HAART) and mPI(HIV+/mPI).
Patients and methods: Cross-sectional study of i) inflammation markers: β2 microglobulin (B2M), ultra-sensitive CRP (us-CRP), D-dimer (DD), ii) IA markers: expression of HLA-DR+ and CD38+ in CD4+ and CD8+ and iii) MT markers: lipopolysaccharide, CD14 and bacterial DNA in HIV- (n = 34), HIV+/No T (n = 5), HIV+/HAART (n = 10) and HIV+/mIP (n = 5) patients.
Results: No differences in any of the studied parameters between HIV/HAART and HIV/mPI patients were observed. Biomarkers of IA were higher in all HIV+ groups (HIV+/No T, $p<0.001$; HIV+/HAART, $p<0.001$ and HIV+/mIP, $p<0.001$) compared to the HIV- group. We found significant differences in DD biomarker of inflammation between VIH/No T patients and HIV- group ($p<0,004$) whilst no differences in any parameter of MT among the four groups were observed.
Conclusions: 1.There is evidence of an increased inflammatory state inHIV+ children without treatment. 2. IA is higher in patients with HIV infection regardless of whether or not receiving therapy and type of antiretroviral treatment. 3. We found no differences in inflammation, MT or IA among HIV patients treated with HAART or mPI. Larger studies are needed to confirm our observation and effectiveness of mPI in this clinical setting.

ESPID-1106

A NOVEL HOST-PROTEOME SIGNATURE TO DISTINGUISH BETWEEN ACUTE BACTERIAL AND VIRAL INFECTIONS IN FEBRILE CHILDREN

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Introduction: Bacterial and viral infections are often clinically indistinguishable, leading to inappropriate patient management and antibiotic misuse. Traditional host-proteins such as C-reactive protein, procalcitonin and interleukin-6 can help determine infection etiology, but their performance is negatively affected by inter-patient variability.

Objectives: To test whether a multi-parametric model that combines both traditional bacterial- and novel viral-induced proteins can improve the discrimination between bacterial and viral etiologies.

Methods : We prospectively recruited 544 children (≤18 years) with acute infectious disease and controls with no apparent infectious disease between 2009 and 2013. Final diagnosis was determined by three independent experts. Unanimous diagnosis was attained in 239 viral, 107 bacterial, and 31 control patients. In 133 patients, no unanimous diagnosis was reached and 34 were excluded. We quantitatively screened 600 circulating host-proteins in one of the largest proteome screenings of infectious disease patients to date. Next, we developed a multi-parametric signature using logistic-regression, and validated it using a leave-10%-out cross-validation scheme.

Results: The final signature consisted of bacterial- and viral-induced proteins, yielding an AUC of 0.94 (95% confidence interval, 0.91 to 0.98). The signature was superior to any of the individual proteins ($P<0.001$), as well as routinely used clinical parameters and their combinations ($P<0.001$). It remained robust across various clinical syndromes (e.g. respiratory, urinary and systemic), times from symptom onset (0-12 days), and the presence of colonizers (AUCs ranged between 0.89 and 0.99).

Conclusions: The present host-signature provides valuable information over routine clinical variables. This approach has the potential to reduce antibiotic misuse in children.

ESPID-1107

THE PRESENTATION OF LIFE-THREATENING SALMONELLA DISEASE IN MALAWIAN CHILDREN

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Background and aims: Nontyphoidal *Salmonellae* commonly cause invasive, and frequently fatal, disease in African children. Clinical diagnosis is hampered by the absence of a well-defined clinical syndrome. Drug resistance renders empirical antibiotic therapy often ineffective. No vaccine is available. We aimed to provide data describing the clinical presentation, co-morbidities and outcome of Malawian children with invasive *Salmonella* disease to better inform their clinical management.

Methods: We conducted a prospective study in consecutive children with microbiologically-confirmed invasive *Salmonella* disease, admitted to Queen Elizabeth Central Hospital, Blantyre. Data on clinical presentation and co-morbidities were used to identify children at risk of inpatient mortality through logistic-regression modeling.

Results: Over one year, 263 children with invasive *Salmonella* disease had a median age of 16 months (range 0-15 years) and 52 (20%) died. Nontyphoidal serovars caused 94% of disease. 81% of isolates were multi-drug resistant. 251 children presented with bacteraemia, 6 with meningitis and 6 with both. 77% presented with respiratory symptoms, 51% gastrointestinal symptoms and 42% with both. HIV infection was common (43%). 25% of children were severely malnourished, 19% severely anaemic and 15% had *P. falciparum* parasitaemia. Presentation with age less than 7 months (OR 10.0; 95% CI 2.8-35.1), dyspnoea (OR 4.2; 95% CI 1.5-12.0) and HIV infection (OR 3.3; 95% CI 1.1-10.2) were independent risk factors for inpatient mortality.

Conclusions: High mortality, prevalence of multi-drug resistant isolates, and a variable presentation, highlight the urgent need to develop strategies for improved prevention, diagnosis and management of invasive nontyphoidal *Salmonella* disease in African children.

ESPID-1108

PROMOTING OF HAND HYGIENE COMPLIANCE TO REDUCE HOSPITAL ASSOCIATED INFECTION IN ICUS IN NATIONAL HOSPITAL OF PEDIATRICS, VIETNAM

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Background and Aims**: Determine the degree of improvement of hand hygiene compliance (HHC) and influence of HHC to reduce HAI in the NHP.* **Subjects: staff and patients at three ICU, NHP.* **Method***: Observe hand hygiene compliance base on WHO's standard tool; measures HAI incidence rate at 2 periods first & second quarter 2012.* **Results***: The hand hygiene compliance rate increased from 59.3% in the first quarter up to 80.4% in the second quarter, according to which the HAI incidence decreased from 0.96% to 0.62% ($\chi 2$ test, $p < 0.05$). Degree improvement of HHC was similar in all occupation of staff and all 5 moment of hand. Rubbing hand with alcohol antiseptic solution has rapidly increased from 25.4% (first quarter) to 70.9% (second quarter).***Conclusion***: Performance of the ICN increases sharply hand hygiene compliance; the hand hygiene compliant rate has increased in all staff. All "5 moments" of hand hygiene was complied similarly. Alcohol with antiseptic solution was preferred on rubbing hand. It's necessary to provide hand rub solution at patient room to reduce HAI*

ESPID-1109

ADVERSE EVENTS IN PREMATURE INFANTS FOLLOWING IMMUNISATION: A COMPARISON OF 3 DIFFERENT PRIMARY SCHEDULES.

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Background & Aims: Hospitalised premature infants have high rates of cardio-respiratory adverse events (CRAEs) following immunisation. We assessed adverse events (AEs) in hospitalised and outpatient premature infants participating in a vaccine clinical trial.

Methods: 210 infants (<35 weeks gestation) were randomised to receive a 13-valent pneumococcal conjugate primary vaccine at 2 & 4 months, 2, 3 & 4 months or 2, 4 & 6 months alongside their routine diphtheria/tetanus/pertussis/polio/Hib combination vaccine and meningococcal C conjugate vaccine. Ventilatory support and episodes of apnoea, bradycardia and desaturation were recorded for 24 hours before and 48 hours after inpatient vaccinations, and local and systemic AEs for 7 days.

Results: There were 639 vaccinations (112 inpatient) of 206 infants. The median birth gestation was 29^{+6} weeks (IQR 28^{+1} – 33^{+1}) and birth weight 1387g (IQR 992–1800).

Following inpatient vaccination, 29 infants (26%) experienced an improvement in their ventilatory support and CRAEs, 26 (23%) a deterioration and 57 (51%) had no change. The most frequent CRAE was an increase in oxygen requirement (24, 24.4%).

Solicited systemic AEs were common and included irritability (294/639, 46%; severe 26, 4.1%), decreased feeding (204, 31.9%; severe 2, 0.3%) and fever (>38°C: 36/639, 5.6%; >39°C 12/639, 1.9%). The schedule had no influence on any AE.

Conclusion: Immunisations are well tolerated by premature infants, regardless of schedule. CRAEs are common in hospitalised infants both before and after vaccination but are as likely to decrease following vaccination as to increase. Monitoring is prudent.

ESPID-1110

RELATIONSHIPS BETWEEN GESTATIONAL AGE, POSTNATAL AGE, CO-MORBIDITIES AND LYMPHOCYTE SUBPOPULATIONS IN PRETERM INFANTS.

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Background & Aims: Absolute counts of lymphocytes and lymphocyte subsets (LS) are positively correlated with gestational age (GA) at birth but there are few data on the effects of increasing postnatal age (PNA) and of comorbidities in preterm infants beyond the first 4 months of life. This study aimed to describe changes in LS in preterm infants up to 13 months PNA.

Methods: Premature infants from 5 centres had LS measured at 2, 5 or 7, 12 and 13 months PNA as part of a vaccine clinical trial.

Results: The median GA was 30+2 weeks (IQR 28+2 – 33+0), birth weight 1400g (IQR 1025 – 1800) and 50% were male. At 2 months of age there were positive correlations between GA and CD3 and CD4 counts ($p=0.007$ & <0.001 respectively), CD4 proportion ($p<0.001$) and CD4:CD8 ratio ($p<0.001$). Absolute numbers of CD3, CD4, CD8, CD16 and CD19/20 cells increased with PNA. LS proportions however, remained stable with increasing PNA, regardless of GA. Chronic lung disease was associated with a decrease in CD4 count and CD4:CD8 ratio ($p=0.001$ & 0.001 respectively), and with an increase in NK count and CD8 proportion ($p=0.04$ and 0.007).

Conclusion: Absolute counts, but not relative proportions, for all lymphocyte subset populations increased with PNA. The lowest counts were seen in the most premature infants. These data can be used to derive reference ranges for lymphocyte subsets in preterm infants over the first year of life.

ESPID-1111

ANTIBIOTIC USE AND ANTIBIOTIC RESISTANCE AMONG HOSPITAL ASSOCIATED INFECTIONS (HAIS) AT THREE ICUS, NATIONAL HOSPITAL OF PEDIATRICS, VIETNAM

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Background: Antibiotic has been commonly using in the National Hospital of Pediatrics (NHP). It is necessary to carry out a frequent assessment of antibiotic indication and antibiotic resistant in the hospital, particularly in those cases with hospital associated infection (HAIs); **Aims**: Assessment of antibiotic indication and combination at three ICUs, NHP; Identification of prevalence of antibiotic resistance in bacteria which cause HAIs. **Methods**: Point prevalence survey (PPS) was conducted every month. **Results:** 669 antibiotics were used, in average 1.6 antibiotic per patient; 21.2% antibiotics were prescribed without any infectious evidence; 44.5% Cephalosporin 3rd and 4th generation and 11.4% Carbapenem were used in uninfectious situations; 36 doses of Colistin were prescribed, 35 was for hospital associated infection; 37 doses of Quinolon was used and all for HAIs; 100% *Staphylococcus aureus* are MRSA, but all are sensitive with Vancomycin; 50% *Pseudomonas aeruginosa* and 85% *Acinetobacter spp* was Carbapenem-resistant. **Conclusion**: Antibiotic indication in the hospital base on physician experience rather than guideline. Bacteria cause HAIs resist to almost antibiotic using in the hospital. Its very necessary to develop an antibiotic stewardship in the hospital to prevent spread of antibiotic resistant bacteria.

ESPID-1115

THE INFLUENCE OF VITAMIN D ON THE SEVERITY OF VIRAL RESPIRATORY INFECTIONS (GENDRES PROJECT)

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Background: VitaminD is known to have modulatory actions in the immune system. Its influence on severity of acute respiratory infections (ARI) is unclear.

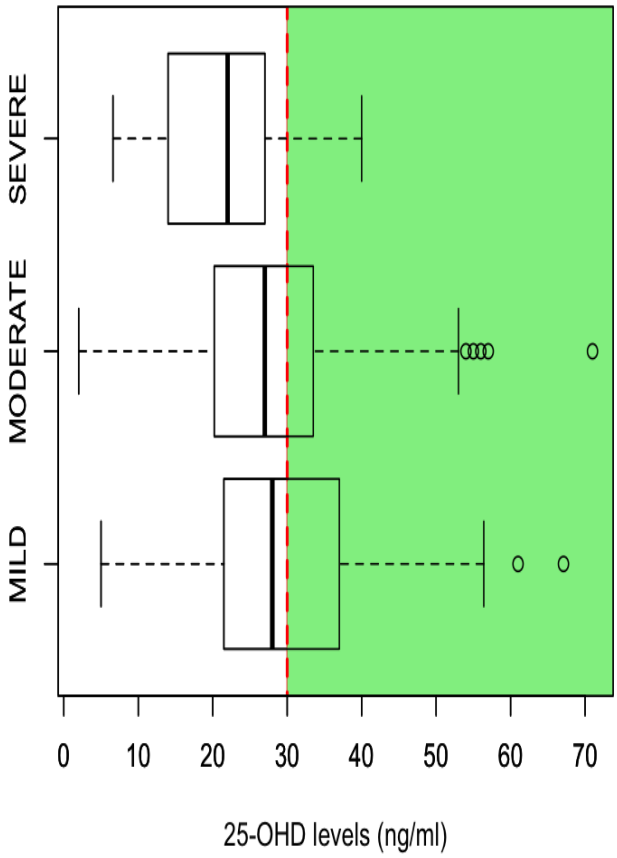
Objectives: To evaluate the role of vitaminD on the course of viral ARI in pediatric patients.

Methods: Pediatric patients admitted to hospital with ARI were prospectively recruited through GENDRES network (www.gendres.org) from March 2009 to May 2013. 25-hidroxyvitamin D (25-OHD) serum levels were measured by immunoassay. The severity of the illness was evaluated according to different criteria including clinical scales, hospital length of stay(HLO), oxygen or respiratory support needs and and PICU admission.

Results: A total of 347 patients with a mean age (standard deviation) of 18.8 (29.3) months were included. The median(SD) 25-OHD levels were of 27.1(11.3) ng/ml (normal:30-40ng/ml). Patients with severe respiratory affection had lower levels of 25-OHD [OR(95%):0.903(0.848,0.961);p=0.001] than patients with moderate [OR(95%):0.971(0.923,1.022);p=0.256] or mild respiratory affection [OR(95%):0.995(0.947,1.045);p=0.840] (Figure). Patients requiring respiratory support [OR(95%):0.925(0.891,0.960);p<0.001] had lower levels of 25-OHD. Oxygen, HLO and PICU admission were not related with 25-OHD levels. The fact of receiving supplement of 25-OHD did not result in any statistically significant change in the severity variables, although 25-OHD levels increased 4.896(2.247,7.545);p<0.001 units in those receiving supplementation.

Conclusion: Children admitted to hospital because of an ARI have 25-OHD levels below normal range. Lower levels of 25-OHD are found to be correlated with severity of the disease. The eventual role of abnormal vitamin D levels as a facilitator or

consequence of the viral infection needs further evaluation.



ESPID-1116

OPTIMIZATION OF ANTIMICROBIAL PRESCRIPTION IN A TERTIARY HOSPITAL- RESULTS OF A 3-YEAR PROGRAM

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Introduction: The misuse of antibiotics is associated with morbidity, mortality and bacterial resistance.

Objectives and aims: To develop an educational institutional program for the optimization of antimicrobial treatment (PRIOAM) involving all units of a tertiary hospital in Seville, Spain, in order to optimize the use of antimicrobial prescriptions, reduce infection associated morbidity and mortality, bacterial resistance and costs.

Methods: To asses in an educational manner during a period of 3 year antibiotic prescriptions for surgical prophylaxis, empiric and directed antibiotic therapy in a 1251 bed tertiary University hospital including 26 units.

Results: A total of 2397 (688 in pediatrics and neonatology) counseling interviews were performed. Inappropriate prescriptions decreased from 53% to 24,1% (Figure 1) and the number of daily defined doses (DDDs)/100 occupied bed-days dropped by 34,1% from 115,1 to 75,8 (Figure 2). The clinical impact of this program is under evaluation. Costs were reduced by 26%, an equivalent of approx 1.000.000 Euros/year during the first 2 years.

Conclusions**:** After a 3 year period of PRIOAM antimicrobial prescriptions have improved and costs have been reduced. This program has now been launched on a state wide level (Andalusia), where it will include 1ª, 2ª and 3ª hospitals as well as primary care centers.

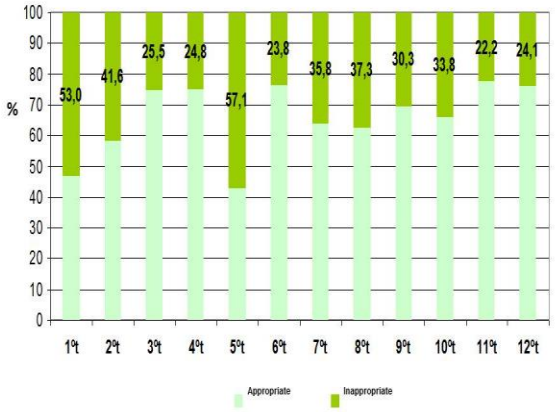

Figure 1: Evolution of inappropriate antibiotic prescriptions of surgical prophylaxis, empiric and directed therapy.

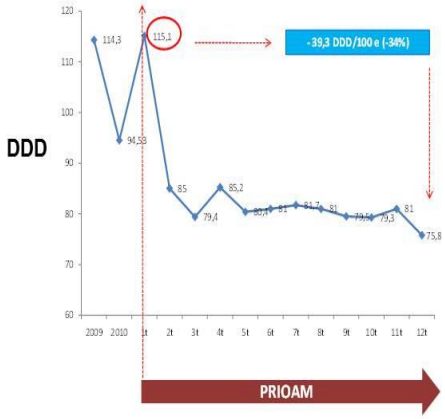

Figure 2: Evolution of daily defined doses (DDDs/100 occupied bed-days) during a 3 year period

ESPID-1118

INVASIVE PNEUMOCOCCAL DISEASE IN SOUTH AUSTRALIAN CHILDREN FOLLOWING INTRODUCTION OF 13-VALENT PNEUMOCOCCAL CONJUGATE VACCINE

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Introduction: Invasive pneumococcal disease (IPD) has decreased markedly following introduction of 7-valent pneumococcal conjugate vaccine (7vPCV) in Australia. In 2011, 13-valent pneumococcal conjugate vaccine (13vPCV) was introduced into the Australian National Immunisation Program.
Aims: This study aimed to assess the impact on IPD following 13vPCV introduction.
Methods: IPD cases in children aged < 18 years in South Australia from January 2005 to December 2013 were identified and clinical details were obtained including causative serotypes.
Results: Following 13vPCV introduction, the highest proportion of IPD cases occurred in children aged > 2 years (14/21, 66%). The majority of IPD cases (71%) required intensive/high dependency care. Over 50% of cases (n=12) required a length of stay > 10 days; median = 14 days. The majority of IPD (17/21) admissions were pneumonia with almost half (n=10) complicated by empyema. One-third of cases (n=7) were deemed moderate/severe (score ≥ 10) using a PELOD severity scoring system. Over half (n=14) of cases had received ≥ 1 dose of 13vPCV. During the 7vPCV era, 23/72 (32%) of cases were due to serotype 19A, compared to 3/21 (14%) of cases in the post 13vPCV era. Causative serotypes since 13vPCV introduction included 13vPCV serotypes (1,7F,9V,19A,19F) and non-13vPCV serotypes (15B,15C,17F,33F), however there were no vaccine failures in children with available immunisation and serotype data.
Conclusions: Whilst the number of IPD cases occurring is relatively low, the severity of cases and complications is high. Monitoring the impact of 13vPCV on severe disease is important to determine any changes in IPD epidemiology.

ESPID-1120

SAFETY AND IMMUNOGENICITY OF INVESTIGATIONAL GROUP B STREPTOCOCCUS TRIVALENT POLYSACCHARIDE-CONJUGATE VACCINE IN HIV-INFECTED AND UNINFECTED PREGNANT AFRICAN WOMEN AND NEWBORNS

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		ELISA GMC at delivery (N subjects) [95% CI]		
Serotype	**Source**	**HIV-**	**HIV+ Low CD4+**	**HIV+ High CD4+**
Ia	Mothers	**3.98** (83) [2.75, 5.74]	**2.07** (83) [1.44, 2.98]	**2.31** (81) [1.60, 3.34]
	Infants	**3.91** (83) [2.56, 5.96]	**1.01** (79) [0.66, 1.56]	**1.22** (81) [0.80, 1.87]
Ib	Mothers	**4.08** (82) [2.85, 5.83]	**1.84** (74) [1.22, 2.77]	**2.40** (80) [1.64, 3.52]
	Infants	**2.67** (57) [1.70, 4.20]	**1.31** (44) [0.78, 2.19]	**1.62** (56) [1.03, 2.56]
III	Mothers	**3.61** (82) [2.51, 5.18]	**1.07** (83) [0.71, 1.60]	**1.03** (72) [0.69, 1.53]
	Infants	**3.88** (66) [2.47, 6.10]	**0.6** (54) [0.36, 0.99]	**0.52** (51) [0.31, 0.88]

Background and aims: Group B streptococcus (GBS) is a major cause of neonatal infection worldwide, often acquired through vertical acquisition by newborns of colonized mothers. We investigated the safety and immunogenicity of an investigational GBS trivalent polysaccharide-protein conjugate vaccine (GBS-CV) among HIV- or HIV+ pregnant women and their newborns.

Methods: To compare responses among HIV-infected and uninfected women, this phase II open-label trial enrolled pregnant women from Malawi or South Africa between 24-35 weeks gestation who were HIV-or HIV+ with CD4+ T-lymphocyte

counts of either > 50 ≤ 350 cells/μL (low-CD4) or > 350 cells/μL (high-CD4). Participants received one dose of GBS-CV containing 5 μg each of polysaccharide-CRM conjugates for serotypes Ia, Ib and III. GBS-specific antibodies were assessed by ELISA in mothers and newborns, with infant safety follow-up to 6 months of age.

Results: 269 pregnant women were enrolled and vaccinated [90 HIV-, 90 HIV+ with low-CD4+ and 89 with high-CD4+]. Vaccination was generally well-tolerated, similar between groups and no SAEs were attributed to vaccination. Antibody concentrations at delivery were higher among HIV- mothers and their infants, than HIV+ mothers and their infants.

Conclusions: GBS-CV was generally well-tolerated. Lower antibody responses were observed among HIV-infected versus uninfected women regardless of CD4+ categorization. Additional studies are needed to guide use of maternal GBS vaccine among HIV-infected women (clinicaltrials.gov NCT01412801).

ESPID-1121

REPEAT IMMUNISATION OF 17-48-MONTH-OLD CHILDREN WITH A REFORMULATED INACTIVATED QUADRIVALENT INFLUENZA VACCINE (QIV) INDUCED MEMORY RESPONSES WITH AN ACCEPTABLE SAFETY PROFILE

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Background and aims: Immunological memory enables superior protection from annual influenza vaccination and faster recovery with less morbidity if naturally infected. This study (NCT01702454) assessed safety and immunological memory, manifested as an anamnestic response to a QIV booster (with antigenically divergent H3N2 and B/Yamagata strains), 1 year after 2-dose primary vaccination with QIV (QIV-primed) or non-influenza vaccines (QIV-unprimed) in 6-35-month-olds (NCT01439360).

Methods: In this phase-III, open-label, multi-centre study, 17-48-month-old children received a QIV booster (n=241; QIV-primed; Day 0) or 2 QIV primary doses (n=229; QIV-unprimed; Days 0+28). Antibody responses were assessed by haemagglutination inhibition (HI) at Days 0+7. Safety endpoints were solicited and

unsolicited adverse events (AEs) during 7 and 28 days post-dose 1, respectively, and serious AEs (SAEs) during 6 months of follow-up.

Results: Day 7 post-vaccination HI antibody responses were higher in QIV-primed than in QIV-unprimed children despite the 2-strain update (Table). The most frequently reported solicited AEs were injection site pain (40.2%[95%CI:33.9-46.7] [QIV-primed]; 26.8%[95%CI:21.1-33.0] [QIV-unprimed]) and irritability (32.4%[95%CI:26.5-38.7] [QIV-primed]; 26.3%[95%CI:20.7-32.6] [QIV-unprimed]). Fever (axillary) >38.0°C was reported in 2.5%[95%CI:0.9-5.4] of QIV-primed and 4.9%[95%CI:2.5-8.6] of QIV-unprimed subjects; fever >39.0°C in 0.8%[95%CI:0.1-3.0] and 0.4%[95%CI:0.0-2.5] of subjects, respectively. No vaccine-related SAEs were reported.

Conclusions: QIV induced robust anamnestic HI responses in QIV-primed children despite the 2-strain update. These data support QIV's effective induction of immune memory after primary vaccination of toddlers and its capacity to enhance immunity, with an acceptable safety profile, after an annual booster.

Funding: GlaxoSmithKline Biologicals SA

Table: Geometric mean titres, mean geometric increases, seroconversion rates, seroprotection rates, geometric mean titre ratios and differences in seroconversion rates for HI antibodies against the 4 QIV strains (per-protocol immunogenicity cohort)

Influenza strain	Timing	Group	N	GMT 95% CI	MGI 95% CI	SCR [%] 95% CI	SPR [%] 95% CI
A/Christchurch/ 16/2010 (H1N1)	Day 0	Primed	221	**43.1** (33.8; 54.9)	-	-	**40.3** (33.7; 47.1)
		Unprimed	202	**14.5** (11.5; 18.2)	-	-	**30.2** (24.0; 37.0)
	Day 7	Primed	224**	**445.6** (376.9; 526.7)	**10.3** (8.5; 12.4)	**76.9** (70.8; 82.3)	**96.9** (93.7; 98.7)
		Unprimed	209**	**45.8** (32.0; 65.5)	**3.2** (2.6; 3.9)	**32.2** (25.8; 39.1)	**34.4** (28.0; 41.3)
A/Victoria/ 361/2011 (H3N2)	Day 0	Primed	221	**12.3** (10.7; 14.1)	-	-	**16.7** (12.1; 22.3)
		Unprimed	202	**16.4** (13.2; 20.4)	-	-	**36.6** (30.0; 43.7)
	Day 7	Primed	224**	**135.3** (113.6; 161.2)	**10.9** (9.4; 12.6)	**81.4** (75.7; 86.3)	**86.2** (80.9; 90.4)
		Unprimed	209**	**47.5** (32.6; 69.3)	**2.9** (2.4; 3.6)	**36.1** (29.5; 43.2)	**38.8** (32.1; 45.7)
B/Brisbane/ 60/2008 (Victoria)	Day 0	Primed	221	**28.5** (23.8; 34.1)	-	-	**32.6** (26.4; 39.2)
		Unprimed	202	**10.0** (8.4; 11.9)	-	-	**19.3** (14.1; 25.4)
	Day 7	Primed	224**	**193.9** (168.7; 222.8)	**6.7** (5.9; 7.6)	**76.5** (70.3; 81.9)	**96.9** (93.7; 98.7)
		Unprimed	209**	**47.1** (35.2; 63.0)	**4.6** (3.8; 5.5)	**38.6** (31.9; 45.7)	**40.2** (33.5; 47.2)
B/Hubei-Wujiagang/ 158/2009 (Yamagata)	Day 0	Primed	221	**11.9** (10.6; 13.3)	-	-	**12.2** (8.2; 17.3)
		Unprimed	202	**6.5** (5.9; 7.2)	-	-	**5.9** (3.1; 10.1)
	Day 7	Primed	224**	**182.6** (159.0; 209.6)	**15.2** (13.3; 17.3)	**94.1** (90.2; 96.8)	**96.4** (93.1; 98.4)
		Unprimed	209**	**26.1** (20.9; 32.7)	**4.0** (3.3; 4.9)	**38.1** (31.4; 45.2)	**39.7** (33.0; 46.7)

Influenza strain	Timing	Group	N	Adjusted GMT ratio (Primed / Unprimed) 95% CI	Difference in SCR (Primed - Unprimed) [%] 95% CI
A/Christchurch/ 16/2010 (H1N1)	Day 7	Primed	224**	**9.0** (6.2;13.0)	**44.7** (35.9; 52.8)
		Unprimed	209**		
A/Victoria/ 361/2011 (H3N2)	Day 7	Primed	224**	**2.7** (1.8; 4.0)	**45.3** (36.6; 53.3)
		Unprimed	209**		
B/Brisbane/ 60/2008 (Victoria)	Day 7	Primed	224**	**3.9** (2.9; 5.4)	**37.9** (28.8; 46.3)
		Unprimed	209**		
B/Hubei-Wujiagang/ 158/2009 (Yamagata)	Day 7	Primed	224**	**6.7** (5.2; 8.6)	**56.0** (48.3; 63.0)
		Unprimed	209**		

HI, haemagglutination inhibition; Day 0, pre-vaccination; Day 7, 7 days post-vaccination; Primed, subjects who received 2 QIV doses in study NCT01439360 and 1 QIV dose in this study; Unprimed, subjects who received 2 doses of a non-influenza vaccine in study NCT01439360 and 2 QIV doses in this study; N, number of subjects with available results (**for SCR and MGI: number of subjects with pre- and post-vaccination results available, i.e. 221 [primed] and 202 [unprimed]); GMT, geometric mean titre; MGI, mean geometric increase in serum HI GMTs from pre- to post-vaccination; SCR, seroconversion rate (% of subjects with pre-vaccination titre <10 and post-vaccination titre ≥40 or pre-vaccination titre ≥10 and ≥4–fold increase in post-vaccination titre); SPR, seroprotection rate (% of subjects with HI titre ≥ 40); CI, confidence interval.

ESPID-1122

IMPROVING PAEDIATRIC ORAL PENICILLIN PRESCRIBING WITHOUT SACRIFICING SPEED AND SIMPLICITY: A PROPOSAL OF NEW WEIGHT-BANDS FOR DOSING REGIMENS

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Background and aims

Oral prescribing of penicillins for UK children in primary care is largely based on an age-banding system, whereas continental European prescriptions are typically weight-based (i.e. milligrams per kilogram per dose). Weight-band prescribing can be advantageous as it may reduce calculation errors. Current guidelines recommend 40mg/kg/day as the minimum target daily dose for amoxicillin therapy, with three times daily dosing favoured due to the short half-life. This project aimed to develop an alternative dosing strategy incorporating weight into amoxicillin prescribing, while maintaining the speed and simplicity of age-based prescribing.

Methods

Basic weight-bands were constructed to increase the proportion of children receiving the target dose of approximately 40 mg/kg/day using current amoxicillin doses (i.e. 250mg and 500mg tablets and 25mg/ml suspension). The weight-band limits were simplified for ease of use. Additionally, double doses were calculated to reach the target 80mg/kg/day (which is used for severe infections including community-acquired pneumonia).

Results

Table 1 presents a revised strategy for mild (standard dose) and moderate to severe infections (double dose).

Conclusions

Although the UK age-based dosing is quick and simple, it can potentially lead to inadequate dosing, especially in the light of rising childhood obesity. The continental approach of weight-based dosing relies on correct dosing calculation and administration of precise dose quantities. Overall, weight-band dosing could facilitate an increase in the number of children reaching desired pharmacokinetic targets for oral amoxicillin therapy.

Weight band (kg)	Daily dose (mg)		Mg/kg/day range (up to 70kg)	
	Standard	Double	Standard	Double
<7	187.5	375	>26.8	>53.6
7 - 15	375	750	25 – 53.6	50 – 107.1
15 - 25	750	1500	30 - 50	60 - 100
>25	1500	3000	21.4-60	42.8-120

Table 1 Proposed weight-bands for paediatric oral amoxicillin dosing to target 40 mg/kg/day and 80 mg/kg/day respectively.

ESPID-1123

THE ANTIBIOTIC RESISTANCE AND PRESCRIBING IN EUROPEAN CHILDREN(ARPEC)PROJECT: PRELIMINARY DATA ON THE 2012 ITALIAN POINT PREVALENCE SURVEY(PPS) OF ANTIBIOTICAL PRESCRIBING

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Background:Inappropriate and excessive antibiotical use is increasing resistence.The ARPEC project provides for using 1-day PPS to standardize a method for surveillance of antimicrobial use in pediatric population admitted to the hospital.We report preliminary data on antibiotical prescribing in hospitalized children in Italy in 2012.

Methods:The survey was conducted in 7 hospitals (Genoa,Florence,Viareggio,Milan,Naples,Padua,Rome) as part of the 2012PPS organized by ARPECproject. The study included all paediatric and neonatal hospitalized patients and identified all children receiving an antimicrobial treatment on the day of survey.Data were entered through a web-based system for data-entry and reporting.

Results:899 patients were surveyed: 27,6 % from neonatal/maternity wards; 72,4% from paediatric wards. 53 patients were newborn, 122 were 1-23 months-old, 201 were 2-17 years-old. 376 (41,8%)were prescribed antimicrobials: 38,9% received antibiotics; 7,2% antifungals; 2,2% antiviral; 5,6% multiple treatment; 0,77%tubercolosis treatment; 0,1% malaria drug. On neonatal wards the commonest reasons for antibiotical treatment were: sepsis (30,20%), prophylaxis for medical problems(16%), for newborn (25,6%) and for maternal (14%) risk factors. On paediatric population (1-23m) the commonest indications were: 19,6% prophylaxis for

surgical disease; 16% respiratory infection. On 2-17yrs-old children: 20% prophylaxis for medical problems, 18,5% for surgical disease, 18,4% respiratory infection, 11% febrile neutropenia in oncologic patients. In general neonatal medical wards and NICU the commonest antibiotics prescribed were beta-lactams (35,7%), in particular Ampicillin.In paediatrics there was more variability: the commonest were 3rd generation cephalosporines(23,8%).

Conclusions: There is a critical need for a correct antimicrobial stewardship:collect and compare data through PPS is the first step to obtain this goal.

ESPID-1126

PAEDIATRIC RESULTS OF THE ECDC POINT PREVALENCE SURVEY OF HEALTHCARE-ASSOCIATED INFECTIONS: THE IMPORTANCE OF RESISTANT GRAM-NEGATIVE BLOODSTREAM INFECTIONS

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Introduction: In 2011–2012, 29 EU/EEA Member States participated in the first EU-wide point prevalence survey (PPS) in acute care hospitals.

Objectives: The objective of this analysis was to evaluate healthcare-associated infections (HAIs) in paediatric patients.

Methods: All countries used a standardised protocol. To estimate prevalence, we took into consideration the clustering at the country and hospital levels by using survey analysis and mixed logistic regression model.

Results: In total, data were obtained from 17,273 children, hospitalised in general paediatrics (48.0%), neonatology (25.9%), neonatal intensive care units (13.2%), paediatric surgery (8.3%), and paediatric intensive care units (PICU) (4.6%). Overall, 726 children accumulated 820 HAIs to a prevalence of 4.2% (95%CI 3.9-4.5%) with bloodstream infections being the leading cause identified (37.0%), followed by infections of the lower respiratory tract (22.6%), the gastrointestinal tract (8.5%), the urinary tract (5.1%), and surgical site infections (4.6%). HAI prevalence was the highest in larger hospitals (6.5%, 95%CI 5.8-7.2%) and in PICU (15.8%, 95%CI 13.4-18.6%). Risk factors for HAIs were the use of medical devices, neonates, and higher McCabe scores. Pathogens were isolated in 47.8% of HAIs with Enterobacteriaceae being the commonest cause overall (30.7%), then coagulase-negative staphylococci at 22.1%. A total of 18.8% of *Staphylococcus aureus* were meticillin-resistant, and Enterobacteriaceae were resistant to 3rd-generation cephalosporins and carbapenems in 44.4% and 8.6%, respectively.

Conclusions: To our knowledge this is the largest ever paediatric HAI point prevalence survey conducted. It demonstrates the major problem of HAI due to multidrug-resistant Gram-negative in European inpatient children.

ESPID-1128

BACTERIAL SCREENING AND ANTIBIOGRAM PROFILE OF SAMPLES FROM NEONATAL DEPARTMENT

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Introduction: Healthcare associated infection is a major problem in acute hospital settings and infection rates are the highest in neonatal and paediatric intensive care units. The bacterial pathogens and drug resistance are different in different hospitals which warrant investigating the type of bacterial isolates and their antibiotic susceptibility in order to control hospital acquired infection. **Aim**: The aim was to identify organisms isolated from different samples taken at the neonatal unit and identify their sensitivity to antimicrobials. **Methods**: Samples were obtained from different areas of the neonatal ward, patients, nurses, physicians and other personnel working in the department and in contact with the patients. These samples were referred to the Clinical Laboratory of the hospital and antibiogram of clinical isolates was investigated. **Results**: A total of 42 isolates were obtained of which *Staphylococcus aureus* (20) was the most prevalent. This was followed by *Staphylococcus aureus* (7), *Streptococcus* spp. (4), *Escherichia coli* (4) and *Klebsiella pneumonia* (5) and *Enterobacter aerogenes* (2). The Gram positive isolates were more resistant to ampicillin and trimethoprim-sulphamethoxazole but sensitive to ciprofloxacin, amoxicillin-clavuanic acid, and cefotaxime. The Gram negative bacilli showed resistance to trimethoprim-sulphamethoxazole, amoxicillin-clavuanic acid, and ampicillin whereas they were sensitive to ceftriaxone, cefotaxime and ciprofloxacin. **Conclusion**: It could be suggested from these results that patients in this ward might be at higher risk of being infected with antibiotic resistant strains during admission. Effective infection control programs require specifically trained infection control practitioners, involvement of physicians, nurses and administrators, and strategies to educate hospital personnel.

ESPID-1129

SUSTAINED IMMUNOGENICITY OF THE HPV-16/18 AS04-ADJUVANTED VACCINE ADMINISTERED AS A 2-DOSE SCHEDULE IN ADOLESCENT GIRLS: 5-YEAR CLINICAL DATA AND MODELLING PREDICTIONS

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Important note: Seropositivity rates and GMT disclosed in the abstract table were incorrectly reported. Refer to the e-poster available online to access to the correct numbers. Of note, messages and conclusions conveyed in the original abstract are not affected by these post-submission changes and remain fully valid.

Background and aims: The licensed formulation of human papillomavirus (HPV)-16/18 AS04-adjuvanted vaccine (20µg each of HPV-16/18 antigens) was found to be highly immunogenic, whether administered as a 2-dose schedule (2D) in girls aged 9-14 years (y) or 3-dose schedule (3D) in women aged 15-25y (NCT00541970). This end-of-study analysis extends immunogenicity and safety data until Month (M) 60, and presents statistical modelling results predictive of long-term antibody persistence.
Methods: Healthy females (age stratified: 9-14y/15-19y/20-25y) were randomized to receive 2D at M0,6 (N=240) or 3D at M0,1,6 (N=239). Here, results are reported for girls aged 9-14y (2D) and women aged 15-25y (3D). Seropositivity rates, geometric mean titres (ELISA) and geometric mean titre ratios (GMRs; 3D/2D; exploratory analysis) were calculated. Safety (serious adverse events; SAEs) was assessed. Antibody persistence was estimated by piecewise and modified power-law models.

Results: All subjects seronegative prior to vaccination were seropositive for HPV-16/18 at M60. Antibody responses elicited by the 2D schedule and standard 3D schedule were comparable at M60, with GMRs being close to 1 (**Table**). Statistical modelling predicted that in 95% of women, antibodies induced by 2D and 3D schedules could persist above natural infection levels for minimum 21y (**Table**). During M0-60, no SAEs were considered as vaccine-related; both schedules had

clinically acceptable safety profiles.

Table: Serum antibody responses and duration of antibody persistence above natural infection levels as predicted by statistical modeling*

	Observed serum antibody response 60 months post-vaccination					Predicted duration of antibody persistence above natural infection‡ levels in 95% of women			
	Subjects seronegative† at baseline, M60 ATP cohort for immunogenicity					Total vaccinated cohort (received all doses)			
Antigen	Seropositivity rates, % (n/N)†		GMT (EL.U/mL)			Piece-wise model		Modified power law model	
	2D (9-14y)	3D (15-25y)	2D (9-14y)	3D (15-25y)	GMR (95% CI)	2D (9-14y)	3D (15-25y)	2D (9-14y)	3D (15-25y)
HPV-16	100 (46/46)	100 (84/84)	1340.0	1509.2	1.13 (0.82, 1.54)	24.4y	22.0y	Always	Always
HPV-18	100 (46/46)	100 (89/89)	622.5	656.9	1.06 (0.74, 1.51)	27.3y	21.5y	Always	Always

*Statistical modelling described in David *et al.* Gynecologic Oncology 2009; 115:S1–S6.
†Seronegative subjects defined as subjects with antibody titres <19 EL.U/mL (HPV-16) or <18 EL.U/mL (HPV-18) prior to vaccination.
‡Natural infection, subjects who had cleared infection had GMTs of 29.8 (HPV-16) and 22.6 EL.U/mL (HPV-18) in the PATRICIA trial (NCT00122681; Paavonen *et al.* Lancet 2007; 369:2161–70).
EL.U, ELISA Unit; 2D, 2-dose schedule with HPV-16/18 AS04-adjuvanted vaccine (M0,6); 3D, 3-dose schedule with HPV-16/18 AS04-adjuvanted vaccine (M0,1,6); M, months; y, years; ATP, according-to-protocol; N, number of evaluable subjects seronegative at baseline in the M60 ATP cohort for immunogenicity; n (%), number (percentage) of seropositive subjects; CI, confidence interval; GMR, geometric mean titre ratio (3D/2D); GMT, geometric mean titre.

Conclusions: A 2D schedule (M0,6) of HPV-16/18 vaccine was immunogenic for ≥5y in 9-14y-old girls. Statistical modelling predicted that 2D-induced antibodies would persist for longer than 20y.

Funding: GlaxoSmithKline Biologicals SA.

ESPID-1130

OSTEOARTICULAR INFECTIONS IN CHILDREN: A PORTUGUESE STUDY (1994 - 2013)

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Objectives: To describe the epidemiological, clinical and outcome features of hospitalized paediatric patients with osteoarticular infections (OAI) in a Portuguese tertiary hospital.
Methods: Retrospective observational study of paediatric patients with OAI from 1994 to 2013.
Results: OAI were diagnosed in 125 (54 osteomyelitis; 44 arthritis and 27 osteoarthritis) patients, 64% cases occurred in the second half of the study with incidence peaks in 2012-2013 (26.4%).
Acute (77.6%) presentation was the most frequent, followed by sub-acute (18.4%) and chronic (4.0%). The diagnosis was culture-confirmed in 44.0% patients (29 MSSA; 1 MRSA; 7 GAS; 4 GBS & 14 others) and source of infection was haematogenous in 88.0% cases.
Patients had a median age of 68 (IQR: 15-115) months; 67.2% were male and 69.0% had risk factors. The lower extremities were most frequently affected; 10.4% had multifocal involvement.
The incidence of fever was lower in chronic OAI ($p<0.05$), and C-reactive protein on admission was higher in acute compared to subacute&chronic OAI (median: 6.2vs.4.1vs.1.7; $p<0.05$).
The median length of intravenous antibiotic therapy was 19.0 (IQR: 14.0-26.5) days, with apyrexia achieved in a median of 2.0 (IQR: 1.0-3.0) days, and clinical improvement in 5.0 (IQR: 3.0-7.0) days.
Complications occurred in 38 (31.9%) patients; one patient had relapse and fourteen (12.7%) developed sequelae. Complications were higher in the subacute&chronic OAI compared with acute ($p=0.001$).
Conclusions: An increased number of OAI cases were detected in the last years. The higher number of complications described is due to the inclusion of subacute and chronic OAI in our study.

ESPID-1131

NON-INFERIORITY OF HPV-16/18 AS04-ADJUVANTED VACCINE ADMINISTERED AS 2-DOSE SCHEDULES IN GIRLS (9–14 YEARS) VERSUS 3 DOSES IN WOMEN (15–25 YEARS): A RANDOMISED TRIAL

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Background and aims: We present the immunogenicity of the human papillomavirus (HPV)-16/18 AS04-adjuvanted vaccine when administered to girls (9-14 years [y]) as an extended 2-dose (2D months [M]0,12) schedule versus a 2D(M0,6) schedule and versus the standard 3-dose (3D[M0,1,6]) schedule in women (15-25y).

Methods: In this phase-III, randomised, open-label, multi-centre trial (NCT01381575, clinicaltrials.gov), healthy girls (9-14y) were randomised (1:1) to receive a 2D schedule of HPV-16/18 AS04-adjuvanted vaccine at M0,6 or M0,12; healthy women (15-25y) received a 3D(M0,1,6) schedule. Anti-HPV-16/18 antibodies (ELISA and pseudovirion-based neutralising assay [PBNA]) and T-cell and B-cell-mediated immune responses were measured. Reactogenicity/safety were recorded.

Results: Of 1447 subjects enrolled, 1355 (534 in 2D[M0,6]; 394 in 2D[M0,12]; 427 in 3D[M0,1,6]) were included in the according-to-protocol cohort for immunogenicity (ATP-I). In initially seronegative subjects from the ATP-I, the 2D(M0,12) anti-HPV-16/18 response (ELISA) was non-inferior to the 2D(M0,6) and 3D(M0,1,6) responses 1M post-vaccination; the 2D(M0,6) response was non-inferior to the 3D(M0,1,6) response 6M post-vaccination (Table). Anti-HPV-16/18 neutralising antibodies (measured by PBNA) were higher for the 2D(M0,6) and 2D(M0,12) schedules versus the 3D(M0,1,6) schedule 1M post-vaccination; and similar between the 2D(M0,6) and 3D(M0,1,6) schedules 6M post-vaccination. Specific HPV-16/18 T-cell and B-cell responses were similar between groups (descriptive analyses). The vaccine showed a clinically acceptable safety profile in all groups.

Table: Non-inferiority of the HPV-16 and HPV-18 antibody responses (ELISA) between 2D and 3D vaccination schedules (initially seronegative subjects, ATP-I)

Antibody	N	Seroconversion rate, % (95% CI)	GMT, EU/mL (95% CI)	N	Seroconversion rate, % (95% CI)	GMT, EU/mL (95% CI)	Seroconversion difference*, % (95% CI)	GMT ratio** (95% CI)
2D(M0,12) vs 3D(M0,1,6) 1M after last vaccination	**2D(M0,12)**			**3D(M0,1,6)**			**3D-2D(M0,12)**	**3D/2D(M0,12)**
Anti-HPV-16	355	100 (99.0, 100)	11449.7 (10635.3, 12326.5)	347	100 (98.9, 100)	10175.6 (9202.4, 11257.8)	0.00 (-1.10, 1.07)	0.89 (0.79, 1.01)
Anti-HPV-18	369	100 (99.0, 100)	6656.3 (6153.6, 7200.2)	376	100 (99.0, 100)	5018.7 (4583.4, 5495.3)	0.00 (-1.01, 1.03)	0.75 (0.67, 0.85)
2D(M0,12) vs 2D(M0,6) 1M after last vaccination	**2D(M0,12)**			**2D(M0,6)**			**2D(M0,6) – 2D(M0,12)**	**2D(M0,6)/2D(M0,12)**
Anti-HPV-16	355	100 (99.0, 100)	11449.7 (10635.3, 12326.5)	480	100 (99.2, 100)	9396.0 (8808.3, 10022.9)	0.00 (-0.79, 1.07)	0.82 (0.74, 0.91)
Anti-HPV-18	369	100 (99.0, 100)	6656.3 (6153.6, 7200.2)	485	100 (99.2, 100)	5920.8 (5515.9, 6355.4)	0.00 (-0.79, 1.03)	0.89 (0.80, 0.99)
2D(M0,6) vs 3D(M0,1,6) 6M after last vaccination	**2D(M0,6)**			**3D(M0,1,6)**			**3D-2D(M0,6)**	**3D/2D(M0,6)**
Anti-HPV-16	480	100 (99.2, 100)	2663.2 (2489.4, 2849.2)	347	100 (98.9, 100)	3317.2 (2983.7, 3688.0)	0.00 (-1.10, 0.79)	1.25 (1.10, 1.40)
Anti-HPV-18	485	100 (99.2, 100)	1526.3 (1409.8, 1652.4)	376	100 (99.0, 100)	1505.4 (1355.4, 1672.0)	0.00 (-1.01, 0.79)	0.99 (0.87, 1.12)

*Non-inferiority for seroconversion rates was met if, for both HPV-16 and HPV-18, the upper limit of the 95% CI for the seroconversion difference was <5%. **Non-inferiority for GMT was met if, for both HPV-16 and HPV-18, the upper limit of the 95% CI for the GMT ratio was <2. ELISA=enzyme-linked immunosorbent assay; 2D=2-dose schedule; 3D=3-dose schedule; ATP-I=according-to-protocol cohort for immunogenicity; CI=confidence interval; GMT=geometric mean titre; EU=ELISA units; M=month; N=number of subjects with available results.

Conclusion: The HPV-16/18 AS04-adjuvanted vaccine showed a non-inferior anti-HPV-16/18 immune response when administered as 2D(M0,12) or 2D(M0,6) in girls (9-14y) versus 3D(M0,1,6) in young women (15-25y).

Funding: GlaxoSmithKline Biologicals SA

ESPID-1132

DIAGNOSTIC UTILITY OF 16S RIBOSOMAL DNA PCR IN MALAWIAN CHILDREN WITH PNEUMONIA OR MENINGITIS

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Background and aims:

Accurate identification of the aetiology of serious infection is essential in low-income settings where empirical treatment is common, and where HIV alters epidemiology. 16S rDNA PCR has been shown to increase diagnostic yield in high-income settings, but data from low-income settings are limited. This study aimed to determine the diagnostic utility of 16S rDNA PCR of blood in Malawian children with pneumonia or meningitis.

Methods

Children aged 2 months-16 years with meningitis or radiologically-confirmed pneumonia were prospectively recruited from a tertiary Malawian hospital between April 2004 and October 2006. Only children with negative initial diagnostic tests (including blood, CSF or lung aspirate culture and multiplex PCR for S.Pneumoniae, N.Meningitidis and H.Influenzae) were included in this sub-study. DNA was extracted from whole blood using commercial kits following enzymatic bacterial lysis. Custom 16S rDNA primers and DNA-free PCR reagents were used. Amplicons were detected by agarose-gel electrophoresis.

Results:

82 children with no confirmed bacterial aetiology had blood available for analysis. 65/82 (79%) of samples were negative for bacterial DNA. 17/82 (21%) showed a low intensity band of the expected size, but also multiple non-specific bands. These samples were also reported as negative.

Conclusions:

In this highly-selected cohort of Malawian children with pneumonia and meningitis, 16S rDNA PCR of blood did not increase diagnostic yield. A high proportion of children may have had non-bacterial infections. Technical limitations of retrospective sample processing may have reduced sensitivity. Further research is needed to fully assess the utility of 16S rDNA PCR in Malawi.

ESPID-1133

ASSESSMENT OF GROWTH AMONG HIV-EXPOSED, UNINFECTED INFANTS IN KENYA - EVALUATION OF INFLUENCE FROM MVA.HIVA-VACCINATION, BREASTFEEDING, ZIDOVUDINE-EXPOSURE AND OTHER FACTORS

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Background and aims: As prevention of mother-to-child transmission of HIV is more successful, the population of HIV-exposed uninfected (HEU) infants is steadily increasing. Evaluation of potential influence of HIV-exposure on infant growth is commonly hampered by health determinants coexisting with HIV/AIDS. Our aim was to assess growth within a cohort of HEU-infants in an MVA.HIVA-vaccine trial, taking into consideration both maternal and infant characteristics.

Methods: Anthropometric measurements were recorded from birth up to maximum 48 weeks within the trial PedVacc002. Growth z-scores were created using WHO-MGRS references. Outcomes were evaluated within the cohort with respect to MVA.HIVA-vaccination, gender, antiretroviral treatment (ART), breastfeeding, maternal educational level and CD4-count. Growth trajectories were presented graphically and formally compared using repeated measures linear regression.

Results: Of 93 enrolled infants, 73 were randomized at age 20 weeks to MVA.HIVA (n=36) or control. No association was found between growth and MVA.HIVA-vaccination. In a fully adjusted model, infants to women who received ARTs containing Zidovudine prior to enrolment, at follow-up antenatal visit and delivery showed overall significantly lower Weight-for-Age (p=0.031) and Length-for-Age (p=0.004) than infants of women who were not exposed at all mentioned time-points. These growth differences were more apparent among breastfed infants. Female gender was positively associated with Length-for-Age (p=0.008).

Conclusion: MVA.HIVA-vaccination was shown safe concerning growth. The association between mothers' ART and infant growth was potentially correlated to other factors than drug toxicity. This study emphasises the need for more research to understand how factors other than the HIV-exposure itself affect development among HEU-infants.

ESPID-1134

PREVALENCE OF EXTRAPULMONARY TUBERCULOSIS DISEASE IN A TERTIARY HOSPITAL: RETROSPECTIVE ANALYSIS OF 6 YEARS.

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INTRODUCTION:
Tuberculosis infection (TBI) in young children can rapidly progress to tuberculosis disease (TBD), including severe and extrapulmonary diseases (ETBD). In up to 50% of cases of ETBD, tuberculin test (TST) is negative. Non-specific symptoms, lack of standardized case definition and the difficult microbiological isolation make it difficult to establish a definitive diagnosis.

METHODS:
Retrospective descriptive study of patients diagnosed with ETBD in a tertiary hospital during 2008-2014, excluding tuberculous adenitis. Demographic, clinical and microbiological data were collected and analyzed.

RESULTS:
Of 128 patients with TBD, 13 patients had ETBD (7 males), 7 were foreign (5 Romanians, 1 each from Senegal and Bolivia). The median age at diagnosis was 20 months (range: 4-144). In 31%, index case was a parent. TB meningitis was the most common ETBD, followed by one patient each with peritoneum, pericardial, testicular, osteoarticular, liver and intestinal ETBD. Mean interval from onset of symptoms to admission was 14.5 days (range 0-150). In 61.5% TST was positive.
M. tuberculosis was microbiologically isolated in 69.2%. The median time from admission to start of treatment was 6 days (range: 0-15). 76.9% started with four anti-tuberculosis drugs, 20.7% with three; during 6 months (12 if TB meningitis) and 61.5% received corticosteroids. All strains were sensible to 1st line TB therapy.

CONCLUSIONS:

1. ETBD is challenging in diagnosis.

2. TB meningitis was the most common ETBD.

3. All patients were diagnosed within 15 days of onset of symptoms

4. All isolated TB strains were sensible to 1st line TB therapy

ESPID-1135

ROLE OF VIRAL INFECTIONS IN CHILDREN WITH SICKLE CELL DISEASE ADMITTED TO THE HOSPITAL WITH FEVER

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Introduction and aims: Bacterial infections have diminished in the last years in children with sickle cell disease (SCD). However, the role of viral infections it is not well characterized in these patients. Our aim was to describe viral infections in children with SCD.

Methods: Retrospective, descriptive study of viral infections in patients with SCD younger than 18 years old admitted to the hospital because of fever from 11/2004 to 12/2013.

Results: Two hundred and forty eight episodes of fever were reviewed. Median age was 2.8 years old (1.3-4.2), length of admission 5 days (3-7) and duration of fever 2 days (1-4). Five patients (2%) needed PICU admission without any death. Only 16 patients had a bacterial isolation, with 1 positive blood culture. A viral antigen test or culture was performed in 98/248 (39.5%) and a positive result was obtained in 30 of them, mainly: influenza (9), RSV (8), rotavirus (3), and adenovirus/parainfluenzae (2 each). Longer duration of fever and hospitalization was observed in patients who underwent a viral test. Among them, those with positive results were older (77.4% >2 years old, p=0.039), had higher temperature (39ºC vs 38.6ºC, p=0.03), and less vasoocclusive episodes (9.7% vs 28.4%, p=0.039).

Conclusions: This cohort of children with SCD had a high prevalence of viral infection, which may have implications in their management. Since children who underwent viral tests had specific characteristics such longer duration of fever and hospitalization, further prospective studies are necessary to evaluate the prevalence of respiratory viruses in these patients.

ESPID-1136

13 VALENT PNEUMOCOCCAL CONJUGATE VACCINE IMMUNOGENICITY IN PREMATURE INFANTS: A COMPARISON OF 3 DIFFERENT PRIMARY SCHEDULES.

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Background & Aims: Premature infants are at increased risk of invasive pneumococcal disease. Compared to term infants they are more likely to have lower antibody concentrations following vaccination. We assessed the immunogenicity of PCV13 in premature infants in response to 3 immunisation schedules.

Methods: 210 infants (<35 weeks gestation) were randomised to receive PCV13 at 2 & 4 months (group 1), 2, 3 & 4 months (group 2) or 2, 4 & 6 months (group 3) alongside their routine immunisations. Pneumococcal IgGs for the PCV13 serotypes (ST) were measured at baseline and 1 month following their final immunisation (either 5 or 7 months of age).

Results: The median birth gestational age was 29^{+6} weeks (IQR 28^{+1} – 33^{+1}) and the median birth weight was 1387g (IQR 992– 1800), 107 (52%) were male. Baseline geometric mean concentrations (GMCs, µg/mL) were low for all ST (range 0.08 – 0.25) with no significant differences between groups. Percentage of infants with protective concentrations (IgG>0.35 µg/mL) following primary immunisation are shown in table 1.

Conclusions: Premature infants exhibit higher IgG GMCs for 12/13 PCV13 STs when vaccinated using a 3 dose compared to a two dose primary schedule. The proportion protected was unaffected by schedule for 4/13 STs, however better early protection is seen with a 2-3-4 schedule

Table 1: Percentage of participants with IgG>0.35µg/mL (95% CI) following immunisation according to serotype


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ESPID-1137

A CHILD WITH AN ABDOMINAL MASS, WHAT TO THINK AND WHY

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Introduction:
The presentation of extrapulmonary tuberculosis (TB) can challenge the diagnostic skills of physicians and lead to delay disease diagnosis and management.

M. bovis causes disease in cattle. In humans, consumption of unpasteurized infected cow's milk products can cause infection. The anatomic site of *M. bovis* disease is more often extrapulmonary.

Objectives and Methods:
We present a 4 year old woman submitted from another Hospital for abdominal mass. Refered 2 months of afebrile abdominal pain that increased in the last week and weight lost.

She had migrated from Marroc and had a past history of TB in lympho-hematogenous phase diagnosed at 16 months of age treated with a 6 months, four-drug régimen with resolution of the process.

On examination she had a 8 x 8 mass in the right hypocondrium, mobile and hard. She was afebrile and blood tests were normal. Mantoux was positive (20 mmm x 20 mmm) and chest x ray showed pneumonia.

Results:
Laparotomy evidenced a giant tumor lymphadenopaty with cheesy content. Microscópic examination showed granulomatous inflammation with caseating granuloma. Ziehl-Neelsen stain was positive and culture for acid-fast bacilli resulted negative. Identification of *M. bovis* was confirmed by Polimerase chain reaction.

Antitiberculosis therapy (isoniazid, rifampicin, ethambutol) was started

Conclusion:
The case highlight the need for increased awareness of M bovis TB in general and extrapulmonary TB in particular in children originating from a TB endemic country. It is mandatory a high index of suspicion and maintain a greater awareness of the changing epidemiolgic conditions and varied presentation of the disease.

ESPID-1138

THE ROLE OF MULTIPLE VIRAL PCR AND CYTOKINE DETERMINATION TO BETTER ASESS THE RISK OF SEVERE INFECTION IN CHILDREN WITH FEBRILE NEUTROPENIA

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Background: Respiratory viruses (RV) are a common cause of febrile neutropenia (FN) in children with cancer. Early detection of VR by multiple-PCR in conjunction with cytokine profile may improve the risk staging for severe infection in these patients.

Methods: All children with FN admitted to hospital were prospectively enrolled between October'10 and December'13. On admission, the risk of severe infection (RSI) was evaluated by physical examination, laboratory tests including procalcitonin (PCT), and bacterial cultures. Nasopharyngeal wash was obtained for the detection of 16 RV using a multiple-PCR test. Cytokine levels were determined by flow citometry. Children with a RV infection were compared to children with a bacterial infection (BI) by analyzing demographics, symptoms, laboratory parameters and outcome.

Results: Forty five children with 130 episodes of FN were enrolled (56.2% female, median age 5.6 years [3.1-13.8]). According to a hospital protocol, 83.1% were classified as high RSI. Microbiologic confirmation was obtained in 49.2%: 28.3% RV, 24.6% BI and 4.6% mixed RV-BI. Rhinovirus was the most common virus (58%), followed by parainfluenza (11.1%). RV were more common in children with low RSI compared to high RSI (29% vs. 14.8%,p=0.2). On admission, children with BI presented higher median PCT (0.7[0.3-5.1] vs. 0.2[0.1-0.5];p=0.01), IL12 (188.2[5.4-1117.8] vs. 1.8[0-50.6];p=0.04) and TNFa (0 vs. 94.8(0-1593);p=0.06) compared to children with VI.

Conclusions: In our cohort of children with FN, VR were the infectious agents most frequently isolated. Early detection of RV in conjunction with low PCT, IL12 and TNFa could more accurately identify patients with low risk of BI.

ESPID-1141

INTUSSUSCEPTION FOLLOWING FIRST DOSE OF ROTAVIRUS VACCINES IN THE VALENCIAN REGION, SPAIN

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Introduction and objectives: Recent studies in the US, Australia, and Mexico have found an increased risk of intussusception mainly following first-dose rotavirus vaccines. No european studies are available. Because intussusception risk varies across populations and regions, we investigated this association in the Valencian Region, Spain.

Methods: Retrospective self-controlled case series study among 98.3% of the Valencian Region infants ages 45-300 days during 2007-2011. First intussusception episodes were identified from the Spanish hospital database using ICD-9-CM code 560.0, confirmed by chart review using Brighton Collaboration (BC) case Levels 1-2. Vaccination information was obtained from the regional vaccine registry. The risk periods were days 1-7 (main) and 8-21 post-vaccination; the comparison period was days 22-42 post-vaccination. We calculated unadjusted first-dose incidence rate ratios (IRRs) using the vaccinated cases only approach. IRRs were estimated using SAS macros developed by Bart Spiessens. Intussusception rates in the Valencian population will be used for age adjustments.

Results: A total of 136 intussusception cases were identified: 125 BC Level 1, 11 BC BC Level 2. Of them, 35 were vaccinated with ≥ 1 dose. Unadjusted IRR was 6.0 (95% CI: 0.54-66.17) for days 1-7, and 3.0 (95% CI: 0.27-33.08) for days 8-21.

Conclusions: The study was limited due to Valencia´s coverage and population size; the intussusception risk estimates, although non-significant, was similar to that from larger studies abroad. Age-adjustment analyses are been implemented. An extension of this study including additional years is been planned.

Acknowledgement: Hector S. Izurieta, FDA, for assistance in the design and analysis.

ESPID-1142

EVALUATION OF PARAPNEUMONIC PLEURAL EFFUSIONS AND EMPYEMA IN CHILDREN

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Introduction: Parapneumonic effusion (PPE) and empyema are most often seen as a complication of bacterial pneumonia and occasionally associated with atypical bacteria, and viral pneumonia.

Aims: In this study we want to describe and compare demographic characteristics, clinical, laboratory, microbiological findings and treatment options for hospitalized patients with community acquired pneumonia who complicated with pleural effusion or pleural empyema.

Methods: We retrospectively admitted 81 pediatric patients with PPE and empyema from January 2006 to December 2013. We reviewed all hospitalized patients with PPE and empyema according to age, sex, history of cough, dyspnea, chest pain, abdominal pain; application time, laboratory features, length of stay in hospital, medical treatment, surgical interventions.

Results: Fifty two (%64.2) of 81 patients had empyema and 29 (%35.8) had parapneumonic effusions. The mean age at admission for parapneumonic empyema (69.8 ±47.8 months) was significantly younger than children with parapneumonic effusions (100.8±48 months). Fever was the most common presenting symptom in both groups. Mean duration of hospital stay was 21.7±17. 5 days (range 5-56 days) with PPE, was significantly longer than effusion group. The most prevalent pathogen was Streptococcus pneumonia. Tube thoracostomy was performed 45 of 52 patients with empyema group and 7 of 29 patients with effussion group. 17 (32,7 %) patients with parapneumonic empyema required tube thoracostomy with intrapleural fibrinolysis which was significantly higher than effusion group.

Conclusions: Optimal management of parapneumonic effusions is currently controversial. Therapeutic options include antibiotics, thoracentesis, thoracostomy tube drainage, fibrinolysis, video-assisted thoracoscopic surgery and thoracotomy.

ESPID-1143

PREPARATION FOR HPV VACCINE INTRODUCTION AND INITIAL COVERAGE AMONG 11-15 YEAR OLD GIRLS WITHIN SCHOOL BASED VACCINATION PROGRAMME IN FINLAND

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Background/aims. In 2012, Parliament agreed to add HPV-vaccine to National Immunization Programme. Open tender was won by bivalent HPV-vaccine with ASO4-adjuvant. Due to general vaccine safety concerns after post-pandemic vaccination cluster of narcolepsy-cataplexy among children and young adults, prior to introduction in 2013, THL prepared an information campaign targeted to girls 11-15 years of age and their parents to aid evidence-based decision making on HPV-vaccination. Childhood NIP vaccines coverage has been high; optimistic target 80% for HPV- vaccine was set.

Materials and methods. Several stakeholder groups were consulted. Qualitative research methods (focus group discussions) were used to develop and test information materials. HPV-vaccinations (3 dose schedule) were given by school health nurses. Vaccination was recommended to be started from 15-year-olds who would leave primary school by June 2014. Vaccination coverage data was obtained from individual vaccination records transferred to national vaccination register.

Results. Information leaflets on risk of contracting HPV-infection, cervical cancer, HPV-vaccination safety and impact, were created based on advice obtained from focus group discussions and sent home separately to girls and their parents. Website www.tyttöjenjuttu.fi was created. Vaccination coverage data is being validated against source data, ready for presentation by ESPID2014.

Conclusions. Challenge to introduce new adjuvanted vaccine targeted to same age group which had suffered from increase in narcolepsy-cataplexy was addressed by carefully planned information campaign. Qualitative methods were essential in designing materials. Overall HPV-vaccine coverage will not reach 80% even in oldest target age group in first half-year from introduction. Regional differences will be wide.

ESPID-1144

EPIDEMIOLOGY OF BACTEREMIA IN NEONATES AND CHILDREN IN SWITZERLAND – RESULTS OF THE SWISS PEDIATRIC SEPSIS STUDY

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Introduction: Sepsis remains one of the leading causes of childhood mortality worldwide, yet there is a lack of epidemiological data on culture-proven sepsis in children.
Aims: The ongoing Swiss Pediatric Sepsis Study prospectively evaluates the epidemiology of blood culture proven sepsis in children in Switzerland.
Methods: Prospective observational cohort study of newborns and children <17 years with culture-proven sepsis admitted to nine Swiss paediatric tertiary care hospitals between September 2011 and February 2014. Patients presenting with signs of systemic inflammatory response syndrome and laboratory confirmed bloodstream infection were included in this study.
Results: 605 neonates and children with blood culture proven sepsis were enrolled in the study. 34% of sepsis episodes were reported in neonates < 44 weeks gestational age, 15% in immunocompromised children, and 7% after surgical procedures or burns. 24% of children with sepsis suffered from chronic diseases or syndromes. 54% of all sepsis episodes were community-acquired, whereas 46% of episodes were nosocomial. 22% of children required admission to the intensive care unit of which 64% required inotropic support for arterial hypotension/shock. Sepsis-related mortality was 6% overall, and 2% in previously healthy children. *S. pneumoniae*, *S. aureus*, *E. coli*, Group A streptococci and *N. meningitidis* accounted for 70% of community-acquired sepsis cases.
Conclusions: This national surveillance confirms that bacteremia continues to cause a high morbidity with a significant mortality. *S. pneumoniae* remains an important etiology of community-acquired sepsis despite nationwide routine vaccination of infants with PCV7/13 since 2006.

ESPID-1146

USING PRIMARY DATA TO ASSESS PNEUMONIA HOSPITALIZATION RATES 3 YEARS BEFORE AND AFTER PCV10 INTRODUCTION IN BRAZIL

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Introduction and Aims: In Brazil routine immunization with 10-valent pneumococcal conjugate vaccine (PCV10) began in 2010, using a 3+1 schedule for children less than 2 years of age. We assessed the effect of the immunization program on the reduction of the incidence of all-cause pneumonia hospital admissions in infants targeted by the immunization program in Central Brazil.

Methods: We used primary data from an active population-based pneumonia surveillance conducted in infants aged 2-35 months admitted to all pediatric hospitals in Goiania municipality (1,300,000 inhabs), 3 years before (May/2007-2009), and after (Oct/2011-2013) vaccination start. Monthly and annual age-specific incidence rates (x100,000 inhabs) of hospitalized pneumonia (ICD10, J12-J18) were estimated for both pre and post vaccination period. The impact of PCV10 was calculated as the percentage change in rates of pneumonia admission taking as baseline the pre-vaccination period.

Results: The median age for the pre and post vaccination period was 12.0 and 13.0, respectively. Peaks of pneumonia seasonality were very similar in the pre and post vaccination period (March-May). The admission rates for all-causes pneumonia decreased 13.1% (95%CI, 12.9-13.4) in infants aged 2-23 months (from 5,728/100,000 to 4,976/100,000) after routine immunization. A slight decrease (7.4%) in pneumonia hospitalization post vaccination was also observed for children aged 24-35 months (p=0.06).

Conclusions: Significant impact of the pneumococcal vaccination program on the rate of pneumonia admissions was observed 3years after the program implementation in Central Brazil. Further studies with an extended follow-up should confirm the benefit of vaccination through herd effect.

ESPID-1147

RAPID DIAGNOSTIC TESTS FOR DENGUE VIRUS INFECTION IN FEBRILE CAMBODIAN CHILDREN: A CLASSIFICATION AND REGRESSION TREE ANALYSIS

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Introduction

Dengue virus (DENV) infection is prevalent across tropical regions and may cause severe disease. Early diagnosis may improve supportive care.

Objectives

To prospectively assess DENV rapid diagnostic tests (RDTs) to NS1 antigen and anti-DENV IgM (NS1 and IgM) in children in Cambodia.

Aims

To improve diagnosis of DENV infection.

Methods

We enrolled children admitted to hospital with non-localised febrile illnesses during the 5-month DENV transmission season. Clinical and laboratory variables, and DENV RDT results were recorded at admission. Children had blood culture and serological and molecular tests for common local pathogens, including reference laboratory DENV NS1 and IgM assays.

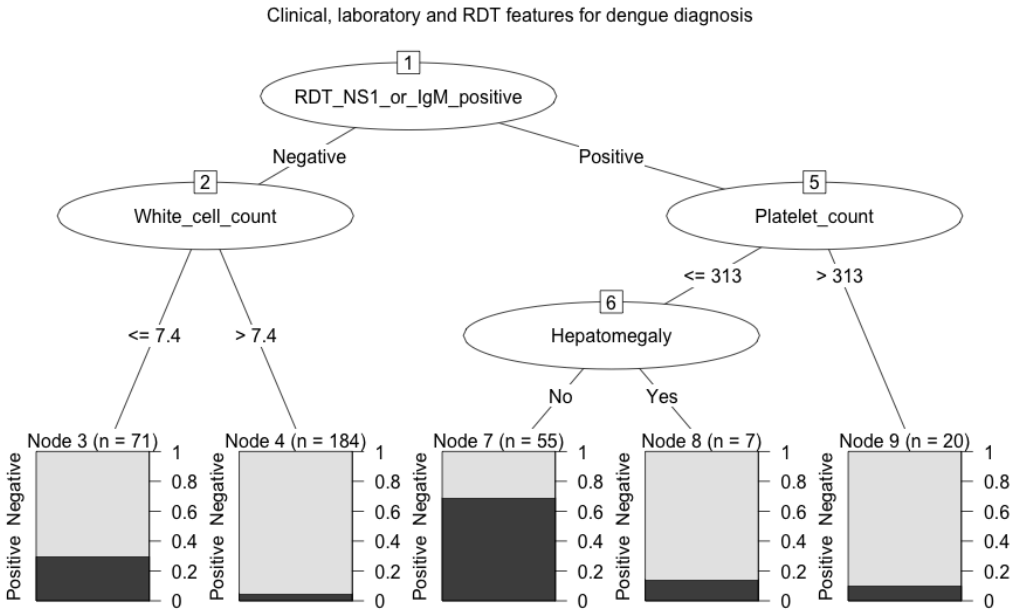
Results

337 children were admitted with non-localised febrile illness over 5 months. 71 (21%) had DENV infection (reference laboratory). Sensitivity was 58%, and specificity 85% for RDT NS1 and IgM combined. Classification and regression tree (CART) analysis showed the additional value of clinical and laboratory variables for diagnosis (Figure). Variables associated with DENV infection were not associated with critical care admission (70 children, 21%) or mortality (19 children, 6%). Known causes of mortality were melioidosis (4), other sepsis (5), and malignancy (1). 16 (23%) of children with DENV infection had another treatable cause of fever.

Conclusions

DENV RDT has low sensitivity for the diagnosis of DENV infection. The high co-prevalence of infections in our cohort indicates a broad microbiological assessment.

Figure. CART decision tree for diagnosis of DENV infection, with proportions of those positive for DENV infection in each terminal node.



ESPID-1148

BEWARE OF SINUSITIS; CASES OF SEVERE COMPLICATIONS PRESENTING TO A REGIONAL PAEDIATRIC UNIT IN IRELAND.

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Introduction. Acute sinusitis is a relatively common condition in children and adolescents. Most cases are managed in the community and will resolve either spontaneously or with oral antibiotics. Complications are due to the proximity of the Para nasal sinuses to the orbit and brain and although rare are associated with significant morbidity.

Methods. Over a 4 month period in a regional paediatric unit there were 4 cases of complicated sinusitis. We describe these cases looking at initial clinical presentation, evolution, outcomes and most recent evidence to guide surgical and antimicrobial management.

Results. The age group was 6-14 years. All were previously healthy children. Complications were Potts puffy tumour, subdural empyema, cerebral abscess and periorbital cellulitis. Headache was a preceding symptom in all cases and eye pain was a symptom in two out of the four cases. Duration of symptoms preceding presentation of complication ranged from 5 days to 8 weeks. Both cases with intracerebral extension presented with a focal seizure. All cases required prolonged courses of Intravenous antibiotics, there was one ICU admission. 3 of the four cases had surgical intervention. An organism was isolated in only one of the cases and this was Streptococcus Constellatus isolated from a subdural collection. All cases were discharged home following a complete recovery.

Conclusion. This unexpected number of cases presenting to a regional unit in a short period of time illustrated the range of potential severe complications of sinusitis in children and the importance of early imaging, Ear Nose and Throat specialist involvement and correct antimicrobial management in these cases.

ESPID-1149

DEVELOPING A EUROPEAN NEONATAL INFECTION SURVEILLANCE NETWORK

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Background and aims: Sepsis is a major cause of neonatal morbidity and mortality. This study compares the demographics and pathogens responsible for neonatal sepsis across European countries participating in a neonatal infection surveillance network (neonIN).

Methods: neonIN is a web-based surveillance database for culture proven neonatal infections. Cases from May 2012-October 2013 were extracted. Early-onset sepsis (EOS) was defined as occurring within 48 hours of birth. Repeated growth of the same organism was considered the same episode if occurring within 10 days.

Results: A total of 665 episodes of infection (involving 550 infants) were recorded. Table 1 shows the demographics of the babies while details of the pathogens are shown in table 2.

Table 1	UK n=494	Estonia n=117	Greece n=54
Number of participating units	25	6	5
Incidence (NNU admissions)	21.7/1000	41.5/1000	32.8/1000
Incidence of EOS (NNU admissions)	1.3/1000	1.8/1000	4.9/1000
Incidence of LOS (NNU admissions)	20.5/1000	39.7/1000	27.9/1000
Sex (males)	302 (61.1%)	56 (47.9%)	39 (72.2%)
Gestational Age at birth (weeks)	26 (24 – 30)	30 (26-38)	34.5 (31 – 38)
Birth weight (g)	830 (672 – 1254)	1402 (924-3100)	2290 (1326 – 3200)
PNA (days)	13.7 (8.3 – 32.6)	11.4 (5.4 – 36.5)	10.0 (3.2– 23.2)
Central line in-situ	452 (91.5%)	44 (37.6%)	10 (18.5%)
Treated for meningitis	42 (8.5%)	5 (4.2%)	7 (13%)

Median (IQR)

Table 2: Pathogens	UK n=494	Estonia n=117	Greece n=54
Overall GP (n (%))	383 (77.7)	84 (71.8)	36 (66.7)
Overall GN (n (%))	89 (18.1)	33 (28.2)	14 (25.9)
Overall fungi (n (%))	21 (4.3)	0	4 (7.4)
Most common pathogen in EOS-GPS (CoNs excluded)	GBS (n=4, 40%)	GBS (n=4, 44.4%)	GBS (n=3, 75%)
Most common pathogen in EOS-GNS	*E. coli* (n=5, 100%)	*K. pneumonia (n=1), E.coli (n=1)*	*Acinetobacter lwoffii (n=1)*
Most common pathogen in LOS-GPS	CoNS (n=250, 69.05%)	CoNS (n=41, 56.9%)	CoNS (n=22, 75.9%)
Most common pathogen in LOS-GNS	*E. coli* (n=33, 39.3%)	*Enterobacter* spp (n=14, 45.2%)	*Klebsiella* spp. (n=7, 53.8%)
Most common fungi in LOS	*Candida albicans* (n=15, 75%)	0	*Candida parapsilosis* (n=3, 75%)

Median (IQR)

GP: Gram-positive bacteria, GN: Gram-negative bacteria, GPS: GP sepsis, GNS: GN sepsis, LOS: Late-onset sepsis

Conclusions: Continuous monitoring and surveillance of infections is a cornerstone for improving the healthcare of neonates. Variations in both disease burden and pathogen distribution exist across Europe, particularly amongst GN organisms. neonIN is now a European neonatal surveillance network that can aid the development of standardised definitions and methodologies and enable a better understanding of these differences.

On behalf of the Neonatal Infection Surveillance Network (neonIN)

ESPID-1150

CHARACTERISTICS OF ENTEROCOCCUS INFECTION IN NEONATES: THE NEONIN SURVEILLANCE NETWORK

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Background and aims: Enterococci (EC) can cause serious infections in hospitalised neonates but their epidemiology is poorly defined. We aimed to define the characteristics of invasive *Enterococcus* infection in neonates from a UK neonatal infection network (neonIN).

Methods: NeonIN is a web-based surveillance system (www.neonin.org.uk). Details of EC cases between July 2005-December 2013 were extracted. Repeated growth of the same organism within 10 days was considered same episode.

Results: There were 218 episodes of EC infection (204 infants, 23 neonatal-units). 198 (90.8%) were isolated from blood with the remainder from CSF (3.2%), urine (4.6%) or other-sites (1.4%). The overall incidence was 0.4/1000 live-births and 3/1000 NNU-admissions. The commonest species isolated were *E. faecalis* (72.9%) followed by *E. faecium* (4.1%) and *E. gallinarum* (0.5%); 22.5% of EC-isolates were not further speciated.

The median (IQR) birth gestation was 26 weeks (24–30) and birth weight 778g (650–1600). There were 10 (4.5%) episodes of early-onset sepsis (within 48hrs of birth) (9 *E. faecalis,* one *E. faecium*). Late-onset infection occurred at a median postnatal-age of 19.8 days (IQR:10.0 – 55.8). 164 (75.2%) had a central line in-situ which was removed in 67 cases (40.9%) due to the infection. Of those tested, 98% (116/118) were susceptible to glycopeptide antibiotics and 91% (78/85) were susceptible to amoxicillin.

Conclusions: EC appears to be a significant pathogen associated with late-onset infection and the presence of central lines in premature neonates. Susceptibility to amoxicillin remains high and vancomycin resistance is rare.

On behalf of the Neonatal Infection Surveillance Network (neonIN)

ESPID-1151

ACUTE MASTOIDITIS IN CHILDREN SINCE 2000: CLINICAL FEATURES, TREATMENT AND OUTCOMES AFTER PNEUMOCOCCAL CONJUGATE VACCINE ¿ANY CHANGES?

Error in relation database
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Introduction: Acute mastoiditis (AM) is an important severe complication of acute otitis media (AOM). Pneumococcal conjugate vaccine (PCV) was included in our regional immunization schedule between 2006-2012.

Aims: The study aim was to review all cases of AM admitted to a hospital during 13 years and analyze its epidemiology and risk factors according to pneumococcal immunization.

Methods: Review of clinical records of patients with AM <16 years old admitted to our hospital between 2000-2013.

Results: One hundred and fifty cases were evaluated. Total incidence was 18 cases/100,000 emergencies. Incidence reached a peak in 2009 (39/100,000). Median age was 19 months (4-189); 61.3% <2 years and 57% male.

Microbiological samples were obtained from blood, external ear, and transtympanic and abscess drainage. A causative agent was yielded in 31% of cases (*S. pneumoniae* 47%, *H. influenzae* 8.5%, *S. aureus* 6%, *anaerobic* bacteria 4%, mixed infection 13%). *S. pneumoniae* was isolated in 62.5% of children <2 years vs 13% in older children (p=0.002). After PCV implementation, *S. pneumoniae* isolation increased from 33% to 65% (p=0.031). The rate of complications was significantly higher in children receiving antibiotics prior to the AM diagnosis.

Conclusions: In our cohort, the incidence of AM may have been related with the PCV implementation. *S pneumoniae* was the most common bacteria isolated, especially in children under two years and early after PCV implementation. Complications were more common in children receiving antibiotics before AM diagnosis. Monitoring incidence of AM and outcome according to different PCV immunization programs is warranted.

ESPID-1152

ADVERSE EVENTS IN LONG-COURSE INTRAVENOUS ANTIBIOTIC THERAPY FOR OSTEOARTICULAR INFECTIONS

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Background: Osteoarticular infections (OAI) are commonly treated with long-course antibiotic therapy, leading to prolonged total length of hospital stay.
Aim: Describe adverse events in patients treated for OAI in a Portuguese tertiary hospital.
Methods: Retrospective observational study of paediatric patients with OAI from 1994 to 2013.
Results: There were 124 patients treated with intravenous antibiotic therapy for OAI (54 osteomyelitis, 44 arthritis and 26 osteoarthritis), with a median length of 19.0 (IQR: 14.0-26.5) days.
Side-effects associated with antimicrobials were observed in 36 (29.3%) patients, most frequently neutropenia (16.3%), eosinophilia (9.8%), anaemia (6.5%), rash (6.4%) and lymphopenia (4.1%), which lead to change antibiotic therapy in three patients. The majority occurred between the 2nd & 4th week of intravenous therapy (38.8%), and were associated with longer duration of parenteral treatment ($p<0.05$), but not with total duration of treatment neither with multiple antibiotic therapies.
Comparing the groups with and without adverse events, time to achieve apyrexia (2.0 *vs.* 2.0 days, p=0.67), clinical improvement (7.0 *vs.* 4.0 days, p=0.06) and C-reactive protein normalization (12.0 *vs.* 10.0 days, p=0.56) were similar.
Twenty-four patients had nosocomial infections (19.2%), mainly gastrointestinal (7.2%) and respiratory (6.4%). Complications associated with intravenous-catheter occurred in twenty patients (11.2% catheter-infiltration, 3.2% thrombophlebitis and 1.6% cellulitis).
Conclusions: Long-course intravenous antibiotic therapy for OAI is frequently associated with adverse events. In patients with clinical and analytical improvement, early transition from intravenous to oral treatment should be considered in order to reduce the incidence and morbidity associated with adverse events.

ESPID-1153

ASSOCIATION OF ALLERGIC RHINITIS AND ASTHMA WITH INFECTION

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Background: Allergic diseases such as asthma and allergic rhinitis are common among children and adults and their association with infection increases the effect of theses allergic diseases on the daily life activities, school and work attendance of the patient and increased the economic burden on the family. **Aim**: the aim of this work was to examine the association of different infection with allergic rhinitis and asthma among children. **Methods:** Data were collected from 213 patients up to 16 years old seen at the allergy and asthma clinic regarding presence or absence of infectious diseases in association with allergic rhinitis and asthma. **Results:** The commonest infection found in the patients included in this study was sinusitis accounting for 123 cases (58%) followed by otitis media in 33 patients (15%), dental caries was seen in 7 patients, and 8 patients suffered from conjunctivitis. In addition, the number of allergic rhinitis and asthma patients with skin infection, gastroenteritis or lower respiratory tract infection was 4 each. **Conclusion:** Although the majority of patients with allergic rhinitis and asthma suffered from sinusitis other infectious diseases in particular otitis media need to be taken into consideration when planning the management of patients with allergic rhinitis and asthma in order to prevent its complications.

ESPID-1154

NEONATAL SEPSIS: COMPARISON OF BACTERIAL AND FUNGAL INFECTIONS FROM THE NEONIN SURVEILLANCE NETWORK 2004 - 2013

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Background and aims: Neonatal sepsis is associated with high rates of morbidity and mortality. This study describes the incidence and the pathogens responsible for infections among a network of UK neonatal units.

Methods: NeonIN is a web-based infection surveillance database for culture proven neonatal infections (www.neonin.org.uk). Cases from March 2004-December 2013 were extracted. Early-onset (EOS) sepsis was defined as occurring within 48hrs of birth. Repeated growth of the same organism was considered the same episode if occurring within 10 days.

Results: 3272 episodes were identified, involving 2982 infants (56% male), from 26 neonatal units. Results are shown in table 1. Overall incidence was 5.0/1000 live-births and 40.3/1000 NNU-admissions.

	Gram positive (GP) (n=2278)			*Gram negative (GN) (n=574)*			*Fungi (n=127)*
	EOS (n=224)	LOS (n=2054)	p	EOS (n=61)	LOS (n=513)	p	LOS (n=124)
Most common pathogen (n (%))	GBS (101, (45.1))	CoNS (1427, (69.5)) or *S. aureus* (158, (25.1) if CoNS excluded)	NA	*E. coli* (44, (72.1))	*E. coli* (153, (29.8))	NA	*Candida albicans* (83, (66.9))
Gestational Age (weeks)	36 (29 – 40)	26 (24–29)	<0.0001	30 (26–35)	26 (24–28)	<0.0001	25 (24 – 26)
Birth Weight (g)	2560 (1200–3424)	820 (675–1146)	<0.0001	1215 (870–2350)	814 (645–1110)	<0.0001	767 (635 – 880)
Postnatal Age (PNA) (days)	0.5 (0-0.9)	16 (8.4 –34)	NA	0.5 (0–1)	22.6 (11 –51)	NA	15.5 (9.5– 23.5)
Isolated from blood (n (%))	214 (95.9)	1980 (97.0)	0.16	58 (96.7)	450 (88.2)	0.12	88 (74.6)
Treated for meningitis (n (%))	28 (12.5)	81 (3.9)	<0.0001	14 (22.9)	56 (10.9)	0.007	14 (11.3)
Central line *in-situ* (n (%))	56 (25)	1466 (71.4)	<0.0001	20 (32.8)	307 (59.8)	<0.0001	92 (74.2)
Line removed due to infection (n (%))	10 (4.5)	654 (31.8)	<0.0001	1 (1.6)	123 (24.0)	<0.0001	42 (33.9)
CRP (mg/dL)	19.5 (4–59)	29 (4–80)	0.41	71 (0–96)	93 (16–160)	0.03	51 (15 – 96)

Medians (IQR). EOS fungal infections are not displayed due to their low number (3). GBS: Group B streptococcus. CoNS: Coagulase negative Staphylococci. CRP(mg/dL): max CRP within 48 hours of culture taken, PNA: postnatal-age

Babies with GP infections had higher birth weights than those with either GN or fungal infections for both EOS (p <0.001) and LOS (p=0.003).

GN infections were associated with an older postnatal-age and maximum CRP compared to those caused by GP (p<0.001 for both) or fungal organisms (p<0.001 & 0.02).

Conclusions: Neonatal sepsis is an important problem, especially in preterm infants. Continuous surveillance is fundamental for describing and understanding the disease burden, defining empiric antibiotic policies and identifying research priorities.

On behalf of the Neonatal Infection Surveillance Network (neonIN)

ESPID-1155

CLINICAL AND ANALYTICAL PREDICTORS OF DISEASE SEVERITY AMONG CHILDREN WITH ACUTE OSTEOARTICULAR INFECTIONS

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Aims: To describe the clinical and analytical profile of acute osteoarticular infections (AOAI) and determine the predictors of disease severity.

Methods: An analytic study was conducted in 97 hospitalised children (median age: 51 months; 68.0% male) with AOAI in a Portuguese tertiary hospital from 1994-2013. The median of intravenous & total antibiotic therapy and follow-up duration was 2.6 weeks; 6.0 weeks and 16.0 months, respectively. Patients were divided in two groups according to the presence of complications and sequelae.

Results: Of the total patients with AOAI (42 arthritis, 35 osteomyelitis and 20 osteoarthritis), 42.3% had culture-confirmed diagnosis (20 MSSA; 1 MRSA; 7 GAS; 4 GBS & 9 others). Complications were diagnosed in 24 (26.1%) patients and long-term sequelae in 9 (10.8%).

The days of illness on admission, the incidence of fever, osteoarticular inflammatory signals/symptoms, the length of intravenous, total antibiotic therapy and the length of hospitalization were similar between the complicated and non-complicated groups.

Parameters that significantly correlated with complicated outcome included: CRP at admission (p=0.017) and peak value (p=0.013), ANC at admission (p<0.001) and peak value (p=0.017), ESR peak value (p=0.002), time to apyrexia (p=0.008) and clinical improvement (p=0.009).

Female sex and AOAI by GAS/GBS were associated with poor outcome, including sequelae (p<0.05). Young age was only predictor of long-term sequelae (p<0.05).

Conclusions: Identification of complicated-outcome predictors is useful in stratifying children with AOAI and predicting sequelae. CRP and ANC at admission and time to apyrexia are early good markers of clinical severity.

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PRELIMINARY DATA OF THE MENDICOS PROJECT: DISEASE COURSE AND SEQUELAE OF INVASIVE MENINGOCOCCAL DISEASE IN SPAIN

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Introduction: Invasive meningococcal disease remains a rare infectious disease with high mortality but also with important morbidity. Until recently no universal vaccine existed against B serogroup, which explains most of the cases in settings like Europe.

Objective: To analyse the clinical course and sequelae of meningococcal disease in Spain.

Methods: Retrospective chart review of all children admitted to any of the hospitals of the MENDICOS network (http://www.mendicos.org/ - spanish hospital network with 36 hospitals) with confirmed or probable invasive meningococcal disease and aged ?15 years, between January 2008 and December 2013.

Results: A total of 476 cases were identified across the country with a mean (standard deviation) 3.3 (3.6) years. 78% (n=375) were confirmed cases. 92% (n=251) of those serogrouped were were B serogroup. The diagnosis was meningitis in 24.6% of the cases, sepsis in 36.7% and both in 38.8%. Mean hospital length of stay was 11.5 (10.8) days. 78% (n=374) of the patients required PICU admission, with a mean PICU stay of 3.9 (4.9) days. 3.4% (n=16) were exitus. 14.5% (n=69) of the survivors were discharged with any kind of physical sequelae.

Conclusion: Serogroup B invasive meningococcal infections explains substantial morbidity and mortality in Spain. The recent availability of a vaccine against B serogroup may change this scenario, and its inclusion in the national immunization program should be carefully considered.