2309. Epidemiology of Meningitis and Encephalitis in Infants and Children in the United States from 2011 to 2014

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Session: 251. Pediatric Potpourri

Background. Large epidemiological studies evaluating the etiologies, management decisions and outcomes of infants and children with meningitis and encephalitis in the United States (US) are lacking.

Methods. Infants (<1 year old) and children (1–17 years) with meningitis or encephalitis by principal or secondary discharge ICD-9 diagnosis codes available in Premier Healthcare Database (PHD) during 2011–2014 were analyzed. PHD contains hospital discharge data including discharge diagnoses, diagnostic and treatment procedures, medications, and cost information from over 700 geographically diverse US hospitals. Descriptive statistics were used to describe the characteristics, etiologies, management decisions and outcomes of study population. Statistical comparisons were made between infants and children.

Results. A total of 6,665 patients with meningitis or encephalitis were identified: 3,030 (45%) infants and 3635 (55%) children. Infants were more likely than children to be hospitalized (91.1% vs 76.3%; P < 0.01) and have lumbar puncture done as an inpatient (22.3% vs 17.0%; P < 0.01). Overall, the most common etiology was enterovirus (31.5%); followed by unknown (15.6%), 23.2%, bacterial meningitis (869, 13.0%), noninfectious (209, 3.1%), herpes simplex virus (HSV) (103, 1.5%), other viruses (47, 0.7%), arbovirus (36, 0.5%), and fungal (3, 0.05%). Overall, empirical antibiotics (97.7% vs. 98.7%, P = 0.003) and steroids (42.4% vs 21.7%, P < 0.001) were more likely to be administered in infants than in children and the use varied by etiologies. Adjunctive steroids were utilized more frequently in children than in infants (11.8% vs. 3.63%, P < 0.001). The overall median length of stay in infants and children was 3 and 2 days, respectively; the longest duration was seen in those infants and children with HSV (20 days/65 days), and with bacterial meningitis (10 days/10 days), respectively. Overall, infant mortality and readmission rates were low (<1% in both infants and children).

Conclusion. Viruses are the most common cause of meningitis and encephalitis in infants and children and are treated with antibiotic therapy in the majority of cases.

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2310. Quality of Life Following Childhood Bacterial Meningitis in Luanda, Angola

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Session: 251. Pediatric Potpourri

Background. Survivorship of childhood bacterial meningitis (BM) from low-income countries are at increased risk of sequelae. How BM survivors’ daily life is affected in the developing world, is not known. We aimed to investigate the quality of life among pediatric survivors of BM in Luanda, Angola assessing both physical and psychosocial health related quality of life (HRQLQ).

Methods. Survivors from two BM treatment trials (ISRCTN62824827; NCT01540838) from Luanda Children’s Hospital were called to follow-up visits in January 2017 with a median duration of 26 months after BM. We administered Pediatric Quality of Life Inventory (PedsQL;2.3) 4.0 Generic Core Scales and Infant Scales, designed to measure HRQLQ in children, to parents/parents of parents, to grandchild and/or parents, to parents, to parents/guardians of children, aged 2–18 years. Parents/guardians were more familiar with the details of their VRP and 92 (88%) had a VRP in all inpatient stays. For the purposes of this analysis, we included 114 survivors: 73 survivors with positive cultures, 1963 were excluded based on nonpathogenic isolates, and 244 were caregivers of children with BM. We calculated Cronbach’s alpha coefficients for each domain and syndrome using descriptive statistics.

Results. In all, 73 survivors of BM and 36 control children participated. 18 (51%) of eligible respondents completed a survey. 24 (32%) reported not knowing if their facility had a VRP and 17 (10%) reported having a policy but were unfamiliar with details; both groups were excluded from further analyses. 104 (61%) reported being somewhat familiar with the details of their VRP and 92 (88%) had a VRP in all inpatient units. Age-based VRP were reported by 77/104 (74%), symptom-based by 101 (97%), and outbreak-specific by 78 (75%). VRP were also implemented in the emergency department by 5 (3%), outpatient clinic by 9 (9%), day surgery by 6 (6%), or radiology by 3 (3%). Symptom-based VRP were seasonal in 24 (24%) of facilities, with 71 (70%) implementation of VRP to famiy members. 53 survivors (91.30) and 24 (92.30) had lumbar puncture done as an inpatient. In the survivors, the Cronbach’s alphas reached sufficient reliability of 0.70 in all three scales: physical health (α= 0.89 for child self-reports and α=0.91, α=0.91, and α=0.84 for parent proxy-reports, respectively).

Conclusion. The survivors of pediatric BM endure a clearly suboptimal quality of life compared with siblings and other control children. HRQOL can be measured reliably among BM patients in developing country setting.

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2311. Visitor Restriction Policies and Practices in Children's Hospitals: Results of an Emerging Infections Network Survey

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Session: 251. Pediatric Potpourri

Background. Balancing the prevention of infections in pediatric healthcare settings with family-centered care is challenging. Visitor restriction policies (VRP) are difficult to implement and enforce. The purpose of this study was to delineate the timing, indications for, and assessment of VRP in pediatric facilities.

Methods. The Infectious Diseases Society of America Emerging Infections Network surveyed 334 pediatric infectious disease consultants via an electronic survey. Descriptive analyses were performed.

Results. One hundred and seventy-five (51%) of eligible respondents completed a survey between 12 July and 15 August 2016. Of these, 44 (27%) reported not knowing if their facility had a VRP and 17 (10%) reported having a policy but were unfamiliar with details; both groups were excluded from further analyses. 104 (61%) reported being somewhat familiar with the details of their VRP and 92 (88%) had a VRP in all inpatient units. Age-based VRP were reported by 77/104 (74%), symptom-based by 101 (97%), and outbreak-specific by 78 (75%). VRP were also implemented in the emergency department by 5 (3%), outpatient clinic by 9 (9%), day surgery by 6 (6%), or radiology by 3 (3%). Symptom-based VRP were seasonal in 24 (24%) of facilities, with 71 (70%) implementation of VRP to family members. 53 survivors (91.30) and 24 (92.30) had lumbar puncture done as an inpatient. In the survivors, the Cronbach’s alphas reached sufficient reliability of 0.70 in all three scales: physical health (α= 0.89 for child self-reports and α=0.91, α=0.91, and α=0.84 for parent proxy-reports, respectively).

Conclusion. VRP vary in scope, implementation, enforcement, and physician awareness in pediatric facilities. A prospective multisite evaluation of outcomes would facilitate the adoption of uniform guidance.

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2312. Epidemiology of Serious Bacterial Infections in a Cohort of Infants in the Military Health System from 2005 to 2015

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Session: 251. Pediatric Potpourri

Background. Management of suspected serious bacterial infection (SBI) in infants less than 3 months old is a challenge faced by all who care for neonates. Understanding the epidemiology of SBI is required to help guide management decisions. Recent publications have challenged the previously accepted distribution of infection by specimen source and identified pathogens.

Methods. We conducted a retrospective analysis of the Department of Defense (DOD) Military Health System (MHS) database to identify SBI cases among term infants, less than 90 days of age born between January 1, 2005 and September 30, 2015. We defined an SBI case as any infant with positive cultures for an accepted pathogen from blood, urine or cerebrospinal fluid (CSF). Infants with multiple positive cultures represent a single case. Infants with characteristic of prematurity birth were excluded by ICD-9 code.

Results. There were 678,214 live births during the study period. Out of 3496 infants with positive cultures, 1963 were excluded based on nonpathogenic isolates, and ICD-9 codes. Of the 1533 episodes of SBI there were 278 episodes of bacteremia, 57 of meningitis, and 1427 of urinary tract infection (UTI). The study period incidence was 2.3 cases/1000 live births. There was a significant trend down from 3.4 cases/1000 live births to 1.7 cases/1000 live births over the study period (P < 0.0001, Figure 1) which was primarily driven by decreasing Escherichia coli (E. coli) UTI. The most common pathogens were E. coli (52.1%), Group B Streptococcus (GBS) (8.0%), and Enterococcus (16.3%). E. coli accounted for 60.1% of UTIs, 10.5% of meningitis, and 19.8% of bacteremia. GBS accounted for 32.7% of bacteremia, 22.8% of meningitis, and 27.5% of UTIs. There were no cases of Listeria.

Conclusion. In this retrospective review of SBI in a large cohort of infants, the case incidence was found to be 2.3/1.000 live births. The most common pathogens were E. coli and GBS. Consistent with recent studies we found no cases of Listeria, however, GBS accounted for a higher percentage of bacteremia and meningitis cases. The significant down trend in incidence over the study period warrants further investigation to assess possible ways to protect infants from this common source of morbidity and mortality.