856. Impact of Antimicrobial Stewardship and Rapid Diagnostics in Children with Staphylococcus aureus Bacteremia

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Background. Rapid diagnostic testing (RDT) in combination with antimicrobial stewardship programs (ASPs) has been associated with improved outcomes in children with Staphylococcus aureus bacteremia (SAB). Data in children are lacking. In January 2017, the Pediatric Health Care Unit of Atrium Health implemented a pediatric culture-and-RDT program. The objective of this study was to determine the impact of those interventions.

Methods. This was a retrospective, multicenter, quasi-experimental study of children <18 years with microorganismsabacterial from March 2015 to August 2016 (pre-intervention; PRE) and March 2017 to August 2018 (post-intervention; POST). The primary outcome was time to an optimal antibiotic. Secondary outcomes included time to effective antibiotic, total antibiotic exposure in the first 5 days, duration of bacteremia, infectious diseases (ID) consultation, time to central line removal, hospital and pediatric ICU length of stay (LOS), need for vasopressors or intubation, recurrence of SAB within 90 days, and inpatient mortality.

Results. Of 101 patients with SAB, 32 and 36 met inclusion criteria for the PRE and POST groups, respectively. The median time to optimal antimicrobial therapy decreased by 23 hours (PRE 44.3 hours vs. POST 21.3 hours; P = 0.008). Duration of bacteremia (65 vs. 40.5 hours; P = 0.028) and mortality (12.5% vs. 0%; P = 0.044) was also significantly reduced. Differences in median time to effective therapy (7 hours vs. 5.1 hours; P = 0.74), total antibiotic exposure in the first 5 days (160.4 hours vs. 152 hours; P = 0.4), hospital LOS (9.9 vs. 8.5 days; P = 0.25), and pediatric ICU LOS (7 vs. 5 days; P = 0.11) did not meet statistical significance. The POST group had more patients with ID consultation (78% vs. 89%; P = 0.23) and shorter time to central line removal (68 hours vs. 20 hours; P = 0.037). There was no difference in the need for vasopressors (3 vs. 3 patients; P = 0.99) or intubation (2 vs. 4 patients; P = 0.68). Throughout the study period, recurrence of SAB only occurred in one patient (PRE).

Conclusion. Concurrent implementation of RDT and an ASP in pediatric patients with SAB decreased time to optimal antimicrobial therapy, duration of bacteremia, and mortality. RDT coupled with timely feedback from an ASP contributed to improved SAB management and clinical outcomes in children.

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856. Invasive Haemophilus influenzae disease in Children: A Canadian MultiCenter Study on Emerging Serotypes

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Background. Our objective was to describe the serotype distribution and clinical spectrum of invasive Haemophilus influenzae (HI) disease in children admitted to participating centers within the Paediatric Investigator's Collaborative Network on Infections in Canada (PICNIC).

Methods. All cases of HI bacteremia were identified from the PICNIC Database of Gram-negative bacteremia (2013–2017). Disease was defined as complicated if the following occurred: (a) ≥2 sites were affected, (b) surgical intervention was required, (c) organ failure, (d) ICU admission, (e) seizures, (f) sensory or motor deficits, (g) treatment-related complications, or (h) death.

Results. There were 98 cases of HI bacteremia. Male to female ratio was 66:34 and median age was 12 (QR: 7–48; range 0–216) months. HI serotypes included: a (N = 31; 31%), b (N = 14; 14%), c (N = 11; 11%), nontypeable (N = 34; 34.7%), and unknown (N = 7; 7%). Clinical foci included: bacteremia without a focus (N = 19; 19%), meningitis (N = 29; 30%), cellulitis (N = 8; 8%), septic arthritis (N = 6; 6%), pneumonia (N = 33; 34%), epiglottitis (N = 1; 1%), and endovascular infection (n = 3; 3%). Complicated disease occurred in 29 (30%) cases; there was one (1%) death. Where serotyping was available, complication rates were: 42%, 22%, 100%, 0%, 33%, and 21% for Hia, Hbc, Hdf, nontypeable Hif and nonlytic Hid, respectively. Factors associated with complicated disease were: age <5 years (P = 0.009), bacteremia without a focus (P = 0.006) and a CNS focus (P < 0.001). Hia was the leading serotype in meningitis (55%; P = 0.022). Nontypeable HI was most frequent in pneumonia cases (56%; P = 0.003) and never caused neonatal disease (0% vs. 14%; P = 0.023). Neonatal disease (N = 5) was predominantly caused by nontypeable HI (80%; P = 0.040). Of note, 26 (27%) of our HI isolates were ampicillin resistant.

Conclusion. In the era of efficacious conjugate Hib vaccines, serotype has emerged as the leading cause of typeable HI disease in Canada and is highly associated with meningitis, especially in young children. Strategies for preventing HI disease need to target this emerging serotype and efforts should be focused toward developing an effective vaccine for serotype d disease.

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883. Evidence from a Multistate Cohort: Enrollment in Affordable Care Act Qualified Health Plans Results in Viral Suppression

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Background. In individual states, the Patient Protection and Affordable Care Act has been associated with improved viral suppression (VS) rates for AIDS Drug Assistance Program (ADAP) clients or low-income people living with HIV (PLWH). This study aims to assess whether this association is consistent in multiple states (Nebraska, South Carolina, Virginia).

Methods. The multistate cohort included ADAP clients who were eligible for ADAP (enrolled Qualified Health Plans (QHPs)). Data were collected from 2014 through 2015. A log-binomial model was used to estimate the association of demographics (age, race/ethnicity, sex, AIDS, rurality, HIV risk factor, previous VS) and healthcare delivery factors (income, previous ADAP plan, previous HIV care engagement) with viral suppression (categorical and continuous variables: acute/infectious disease vs. chronic, health insurance coverage, CD4 count, viral load) in ADAP-funded QHPs in 2015 was higher for those who had ADAP-funded QHPs (P = 0.037). VS = 0.003) and never caused neonatal disease (0% vs. 14%; P = 0.023). Neonatal disease (N = 5) was predominantly caused by nontypeable HI (80%; P = 0.040). Of note, 26 (27%) of our HI isolates were ampicillin resistant.

Conclusion. In the era of efficacious conjugate Hib vaccines, serotype has emerged as the leading cause of typeable HI disease in Canada and is highly associated with meningitis, especially in young children. Strategies for preventing HI disease need to target this emerging serotype and efforts should be focused toward developing an effective vaccine for serotype d disease.

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