1364. Effect of Cefepime Prophylaxis on Bacterial Bloodstream Infections in Neutropenic Patients with Acute Myelogenous Leukemia

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Session: P-61. Pediatric Bacterial Studies (natural history and therapeutic)

Background. Bacteriaemia is a major cause of morbidity and mortality among children with acute myelogenous leukaemia (AML) and chemotherapy-induced neutropenia. Data evaluating the utility of bacterial prophylaxis in this pediatric population are limited. In April 2014, Children’s Health (CH) implemented the use of cefepime bacterial prophylaxis for AML patients undergoing induction and intensification chemotherapy. The objective of this study was to evaluate the impact of this practice on the frequency of documented bacterial bloodstream infections (BSIs).

Methods. This was an observational, retrospective cohort study of patients <21 years of age with AML admitted at CH from January 2010 through December 2018. The primary outcome was frequency of documented BSIs before (PRE; Jan 2010 to Mar 2014) and after (POST; Apr 2014 to Dec 2018) implementation of routine bacteriologic prophylaxis. Secondary outcomes included differences in total antibiotic days per neutropenia days and the occurrence of neutropenia-associated C. difficile infection between groups.

Results. Of 90 patients with AML who met the cohort inclusion criteria, 38 and 52 were treated during the PRE and POST prophylaxis periods, respectively. The incidence rate of documented BSIs per 1000 neutropenia days decreased from 15.5 to 2.8 after the implementation of routine cefepime prophylaxis (incidence rate ratio 0.18, Poisson regression 95% CI 0.93 to 0.33, P<0.001). Patients were more likely to have febrile neutropenia in the PRE group (OR 11.9, 95% CI 6.6 to 20.8). The POST group had more antibiotic days per total neutropenia days (0.76 PRE vs 0.97 POST, P<0.0001), but the frequency of first-episode C. difficile infection was not significantly different between groups (OR 0.36, 95% CI 0.1 to 1.4).

Conclusion. Universal cefepime prophylaxis for children with AML and chemotherapy-induced neutropenia was associated with a significant reduction in the incidence of febrile neutropenia and neutropenia-associated BSIs without increasing the incidence of C. difficile infection.

Disclosures. All Authors: No reported disclosures

1365. How Severe Are Rickettsial Infections Among Children

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Session: P-61. Pediatric Bacterial Studies (natural history and therapeutic)

Background. Rickettsial infections (RI) usually mimic benign viral infection due to similarities in clinical symptoms. However, severe forms and complications have been reported with rickettsiosis. Children can be affected as well. We aimed to study the particularities of RI among children.

Methods. We conducted a retrospective study including all patients aged ≤21 years hospitalized between 1/1/2010 and 5/31/2019 with the diagnosis of rickettsiosis. Children with indeterminate pneumonia were excluded. It would therefore appear that assessment and quantification of nasopharyngeal pneumococcal colonization is not useful to discriminate between acute viral and bacterial respiratory disease in children in North America.

Results. Of the 162 encounters of acute rickettsiosis that met inclusion criteria, the average patient age was 8.3 years. Lower extremity infections were most common (105, 64.8%), followed by upper extremity (31, 19.1%), pelvis (14, 8.6%), spine (7, 4.3%), shoulder (4, 2.5%), rib (1, 0.6%) and mandible (1, 0.6%). Almost half of cases (73, 45%) had no positive cultures, and 89 cases (55%) had at least one positive culture from blood or local source (Figure 1). The most common pathogens was methicillin susceptible S. aureus (MSSA) followed by methicillin resistant S. aureus (MRSA) comprising 60 (67%) and 19 (20%) of culture-positive infections respectively. Other isolated pathogens included S. pyogenes (5, 5.6%) Salmonella species (2, 2.2%), S. pneumoniae (1, 1.1%), S. agalaciae (1, 1.1%) and Kingella Kingae (1, 1.1%) (Figure 1). Among S. aureus infections, 69 (87%) were susceptible to clindamycin (85%) among MSSA, 95% among MRSA.

Categorized Blood and Wound Culture Results

1367. Reduced Cefaroline Susceptibility Among Invasive MRSA Isolates at a Tertiary Children's Hospital

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Session: P-61. Pediatric Bacterial Studies (natural history and therapeutic)

Background. The emergence of community-acquired methicillin-resistant Staphylococcus aureus (MRSA) in the late 1990s-early 2000s complicated the empiric management of suspected staphylococcal infection in children. Rising clindamycin resistance rates in many communities adds further to management challenges. Cefaroline, an anti-MRSA cephalosporin, represents an attractive therapy option. Little data are available, however, regarding the frequency of reduced susceptibility (RS) to cefaroline among MRSA isolates from a general pediatric population.

Methods. Isolates were selected from an ongoing S. aureus surveillance study at Texas Children's Hospital. Invasive MRSA isolates from 2015-2018 were included. Isolates were initially screened for cefaroline RS with E-test; all isolates with a cefaroline E-test MIC ≥ 1.5µg/ml underwent cefaroline broth dilution. Cefaroline RS was regarded as an MIC ≥ 2µg/ml; full cefaroline resistance was defined as an MIC ≥ 8µg/ml. Accessory gene regulator (agr) groups were characterized by PCR.

Results. 201 viable isolates were included. The cefaroline MICC and MIC90 were 0.5 and 1µg/ml, respectively (Figure 1). Six isolates had MIC ≥ 2µg/ml (2.9%) with two having MIC ≥ 8µg/ml (0.9%). All cefaroline RS isolates were from healthcare...
1368. The Clinical Impact of BioFire BCID2 Compared to BCID in a U.S. Pediatric Hospital

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Session: P-61. Pediatric Bacterial Studies (natural history and therapeutic)

Background. Multiplex PCR panels, particularly BioFire FilmArray Blood Culture Identification (BCID), have been shown to decrease time to pathogen identification and time to effective and optimal antimicrobial therapy. BioFire Blood Culture Identification 2 (BCID2) has an additional 17 targets and resistance genes compared to BCID. There is limited data on the impact of these expanded targets in pediatric populations.

Methods. We performed a head-to-head comparison between BioFire BCID2 with BCID when compared to standard culture. From January 2020- May 2020, we ran BCID2 simultaneously as a research use only prototype with the current standard of care on all blood culture specimens at Children's Hospital Colorado. Percent agreement was calculated with BCID2 compared to standard culture and BCID2 compared to standard culture. Time to positivity, time to optimal therapy, and time to effective therapy were also calculated.

Results. We performed an interim analysis halfway through the study with 86 cases met inclusion criteria. The median patient age is 11.8 years and 35.9% patients had underlying comorbidities. 83% of patients underwent a surgical procedure. Cases were diverse in terms of pathogenesis (Figure 1). A microbiologic etiology was identified in 72.8% of cases and was polymicrobial in 20.2% of cases; Staphylococcus aureus was the single most common etiology (CoF), 2) penetrating or open trauma, 3) orthopedic hardware (OH), 4) post-acute chronic osteomyelitis (PACO, those occurring after >28 days of therapy for acute osteomyelitis) and 5) primary hematogenous chronic osteomyelitis (PHCO, those with 28 days of symptoms without other clear risk factors).

Results. 114 cases met inclusion criteria. The median patient age is 11.8 years and 35.9% patients had underlying comorbidities. 83% of patients underwent a surgical procedure. Cases were diverse in terms of pathogenesis (Figure 1). A microbiologic etiology was identified in 72.8% of cases and was polymicrobial in 20.2% of cases; Staphylococcus aureus was the single most common etiology (CoF), 2) penetrating or open trauma, 3) orthopedic hardware (OH), 4) post-acute chronic osteomyelitis (PACO, those occurring after >28 days of therapy for acute osteomyelitis) and 5) primary hematogenous chronic osteomyelitis (PHCO, those with 28 days of symptoms without other clear risk factors).

Conclusion. Ceftaroline RS occurs in 2.9% of invasive MRSA isolates in children and is most prominent among healthcare-associated infections. These isolates were associated with clindamycin resistance and age group II. While ceftaroline RS is rare among invasive MRSA infections, the lack of preceding ceftaroline exposure is concerning and warrants careful surveillance.

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Figure 1. Categories of Chronic Osteomyelitis

Figure 2. Microbiology of Pediatric Chronic Osteomyelitis