1043. Evaluation of Early Clinical Failure Criteria for Gram-Negative Bloodstream Infections
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Friday, October 5, 2018: 12:30 PM
Background. Early identification of patients at high risk of morbidity and mortality following Gram-negative bloodstream infections (GN-BSI) based on initial clinical course may prompt adjustments to optimize diagnostic and treatment plans. This retrospective cohort study aims to develop early clinical failure criteria (ECFC) to predict unfavorable outcomes in patients with GN-BSI.

Methods. Adults with community-onset GN-BSI who survived hospitalization for at least 96 hours at Palmetto Health hospitals in Columbia, SC, USA from January 1, 2010 to June 30, 2015 were identified. Multivariate logistic regression was used to examine association between clinical variables within 72–96 hours of BSI and unfavorable outcomes (28-day mortality or hospital length of stay >14 days).

Results. Among 766 patients with GN-BSI, 225 (29%) had unfavorable outcomes. After adjustments for Charlson Comorbidity Index and appropriateness of empirical antimicrobial therapy with a multivariate model, predictors of unfavorable outcomes included: (1) blood cultures positive for <1 patient in 766 patients from ECFC area. Under experimental characterizing activity of ECFC model in predicting unfavorable outcomes was 0.77 (0.84 and 0.71 in predicting 28-day mortality and prolonged hospitalization separately, respectively). Predicted 28-day mortality increased from 1% in patients with no ECFC to 3%, 7%, 16%, 32%, and 54% in presence of each additional criterion (P < 0.001). Predicted hospital length of stay was 7.5 days in patients without any ECFC and increased by 4.0 days (95% CI 3.1–4.9, P = 0.001) in presence of each additional criterion. Conclusion. Risk of 28-day mortality from Gram-negative bloodstream infections can be estimated within 72–96 hours of GN-BSI using ECFC. These criteria may have utility in future clinical research in assessing response to antimicrobial therapy based on a standard evidence-based definition of early clinical failure.

Disclosures. P. B. Bookstaver, CutisPharma: Scientific Advisor, <1,000. Melinta Therapeutics: Speaker's Bureau, <5,000.

1044. Aztreonam (AZT) vs. Cefepime (CEP) Therapy for the Treatment of Gram-Negative Bacteremia
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Session: 131. Bacteremia and Endocarditis
Friday, October 5, 2018: 12:30 PM
Background. The IDSA recommends use of AZT in patients with a confirmed beta-lactam allergy for nosocomial Gram-negative infections. Despite this recommendation, there is limited data to suggest AZT is inferior to cefepime (CEP) for the treatment of Gram-negative infections. This study aims to evaluate clinical outcomes in bacteremic patients treated with either AZT or CEP therapy.

Methods. A single-center, retrospective chart review of adult patients with positive blood cultures for Escherichia coli, Klebsiella pneumoniae or Pseudomonas aeruginosa was conducted to compare clinical outcomes between those who received ≥ 48 hours of AZT or CEP therapy (ceftazidime or ceftriaxone). The following clinical outcomes were assessed: clinical cure, in-hospital mortality, post-infection length of stay (LOS), post-infection intensive care unit LOS, microbiologic cure and leukocytosis resolution.

Results. One-hundred and twenty-nine patients met criteria for evaluation; 41 received ≥ 48 hours of AZT and 88 received CEP. Patients who received AZT were more likely to have renal dysfunction (34.1% vs. 18.2%, P = 0.046), receive synergistic antimicrobials (61% vs. 28.4%, P = 0.001) and had a longer pre-infection LOS (1 day [0–2] vs. 0–1, P = 0.032) compared with those who received CEP. Although in-hospital mortality rates were similar between both groups (2.4% vs. 3.4%, P = 1.000), there was a statistically significant difference in clinical cure rates (70.7% vs. 90.9%, P = 0.003), post-infection length of stay (7 days [5–10] vs. 5–8, P = 0.007), and time to clinical cure (2.8 days [1.6–5.8] vs. 2.0 [1.2–2.9], P = 0.018) in the AZT and CEP groups respectively. In a multivariate logistic regression model, patients who received AZT were significantly less likely to achieve clinical cure (OR=0.187, 95% CI (0.058–0.597). In a pre-determined subgroup analysis, clinical cure rates varied in E. coli (72% vs. 94.4%, P = 0.009), K. pneumoniae (70% vs. 90.5%, P = 0.296) and P. aeruginosa (66% vs. 100%, P = 1.000).

Conclusion. Patients who receive aztreonam for Gram-negative bacteremia may be more likely to experience clinical failure. Larger, prospective studies are warranted to confirm these findings.

Disclosures. All authors: No reported disclosures.

1045. A Multicenter Propensity Score-Adjusted Retrospective Study for Comparison of the Outcome of Treatment With Third-Generation Cephalosporin vs. Broad-Spectrum Antibiotics for Enterobacter Bacteremia
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Session: 131. Bacteremia and Endocarditis
Friday, October 5, 2018: 12:30 PM
Background. Enterobacter spp. can develop resistance during prolonged therapy with third-generation cephalosporins (3GC: ceftriaxone, cefotaxime, or ceftazidime) because of derepression of AmpC-β-lactamase. However, the clinical significance of this phenomenon remains undetermined. This study aims to assess the outcome of patients with 3GC-susceptible Enterobacter bacteremia (EB) who received definite therapy with 3GC or broad-spectrum antibiotics (BSA) using propensity score analysis.

Methods. In this retrospective, cohort study conducted at two tertiary care hospitals in Japan, we determined consecutive patients with EB identified from the laboratory databases between January 2010 and December 2017. We enrolled patients with 3GC-susceptible EB treated with 3GC or BSA (defined as fourth-generation cephalosporins, carbapenems, and piperacillin/tazobactam) as definitive therapy. The primary outcome measure was mortality during the course of antimicrobial-resistant strain treatment. To compare the outcomes using the propensity scores and inverse-probability-weighting (IPW) adjustment to decrease the confounding by indication.

Results. A single-center, retrospective chart review of adult patients with positive positive blood cultures for Enterobacteriaceae in a tertiary hospital in Japan Nobuki Mori, MD1;2; Narito Kagawa, Mr3; Kotoo Aoki, Mr4; Yoshikazu Ishii, PhD5; Kazuhiro Tateda, PhD, MD6 and Yasuko Aoki, MD3. 1Department of General Internal Medicine, National Hospital Organization Tokyo Medical Center, Tokyo, Japan, 2Department of Medical Microbiology and Infectious Diseases, Toho University School of Medicine, Tokyo, Japan, 3Department of Clinical Laboratory, National Hospital Organization Tokyo Medical Center, Tokyo, Japan, 4General Internal Medicine, National Hospital Organization Tokyo Medical Center, Tokyo, Japan, 5Department of Infectious Diseases, Kameda Medical Center, Kamogawa, Chiba, Japan
Session: 131. Bacteremia and Endocarditis
Friday, October 5, 2018: 12:30 PM
Background. Carbapenemase-producing Enterobacteriaceae (CPE) infection has become a great threat to public health worldwide. Although KPC and OXA-48 infections have mostly described, IMP-1 producing Enterobacteriaceae (IMP-1 E) are not well studied. We investigated the clinical and microbiological characteristics of sepsis due to the IMP-1 E.

Methods. This observational study of inpatients who developed IMP-1 E septicemia was conducted in a Japanese tertiary hospital from April 2013 to March 2017. IMP-1 E was defined as a decreased susceptibility to meropenem (minimum inhibition concentration, ≥2 mg/L), as well as a positive sodium mercaptoacetic acid test, and polyclonal cefazolin MIC test for blaIMP-1. Clinical data were collected from medical charts. Antimicrobial susceptibility was determined by the MicroScan Walkway. We performed total genomic analysis, plasmid analysis, and multilocus sequence typing (MLST) using whole genome sequencing data.

Results. In total, six patients were identified (median age: 55 years). All had severe underlying disease on admission, and five were admitted to the intensive care unit. The sources of IMP-1 E septicemia were as follows: two catheter-related BSI, one pyelonephritis, one cholangitis, one bacterial peritonitis, and one unknown focus. Four isolates were Enterobacter cloacae and two were Klebsiella pneumoniae. All patients had a previous history of antibiotic treatment and long-term hospitalization. All patients were treated with either levofloxacin (LVFX) only or LVFX and aminoglycoside (AG). Follow-up blood culture was negative for all patients. All causes of 30-day mortality rate was 50%. Although no isolates were resistant to LVFX and AG, they harbored tet(B) genes. Two isolates harbored the mcr-8 gene. There was a high probability that mcr-8 was harbored by IncH12 plasmids. MLST sequence type of E. cloacae isolates comprised ST78, and one ST997; K. pneumonia isolates comprised ST134, and ST252.