1043. Evaluation of Early Clinical Failure Criteria for Gram-Negative Bloodstream Infections

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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 in multivariate model, predictors of unfavorable outcomes included systolic blood pressure <100 mmHg or vasopressor use (adjusted odds ratio [aOR] 1.8, 95% confidence interval [CI] 1.1–2.5), heart rate >100/minute (aOR 1.7, 95% CI 1.1–2.5), respiratory rate ≥22/minute or mechanical ventilation (aOR 2.1, 95% CI 1.4–3.3), altered mental status (aOR 4.5, 95% CI 2.8–7.1), and peripheral WBC count $>12 \times 10^3/mm^3$ (aOR 2.7, 95% CI 1.8–4.1) at 72–96 hours from index BSI. Area under receiver operating characteristic curve 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 or prolonged hospitalization 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.

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1044. Aztreonam (AZT) vs. Cephalosporin (CEP) Therapy for the Treatment of Gram-Negative Bacteremia

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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 cephalosporins (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 (cefepime 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 AZT and 88 received CEP therapy. At baseline, 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 [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 [4–8], $P = 0.007$), 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* (66.7% vs. 76.9%, $P = 1.000$) in the AZT and CEP group respectively.

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.

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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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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 phenomena 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 was 28-day mortality. The secondary outcome was the emergence of antimicrobial-resistant strain during antimicrobial therapy. We compared outcomes using the propensity scores and inverse-probability-weighting (IPW) adjustment to decrease the confounding by indication.

Results. We identified 320 patients with EB; of these, 191 cases were eligible (86 treated with 3GC and 105 treated with BSA). All the measured covariates were well balanced after the IPW adjustment. We observed no significant differences in the unadjusted mortality [5.8% in the 3GC group vs. 13.3% in the BSA group; risk difference, −7.5%; 95% confidence interval (CI): −15.7–0.6; $P = 0.09$], and the IPW-adjusted mortality (5.1% vs. 9.4%; risk difference −4.3%; 95% CI: −12.2–3.5; $P = 0.3$) between the groups. The results of the propensity score-matched analysis and sensitivity analysis were similar. Furthermore, we did not observe the emergence of antimicrobial resistance during antimicrobial therapy in both groups.

Conclusion. Definitive therapy with 3GC for susceptible EB was not associated with an increased risk of the 28-day mortality after adjustment for potential confounders with the propensity score analysis or with the emergence of antimicrobial-resistant strain.

Disclosures. **All authors:** No reported disclosures.

1046. Clinical and Microbiological Characteristics of Patients With Septicemia Caused by IMP-1-Producing Enterobacteriaceae in a Tertiary Hospital in Japan

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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 (IMP1-E) are not well studied. We investigated the clinical and microbiological characteristics of septicemia due to the IMP1-E.

Methods. This observational study of inpatients who developed IMP-1E septicemia was conducted in a Japanese tertiary hospital from April 2013 to March 2017. IMP1-E was defined as a decreased susceptibility to meropenem (minimum inhibitory concentration, ≥2 mg/L), as well as a positive sodium mercaptoacetic acid test, and polymerase chain reaction for bla_{IMP} genes. Clinical data were collected from medical charts. Antimicrobial susceptibilitly 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 IMP1-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-cause 30-day mortality rate was 50%. Although no isolates were resistant to LVFX and AG, they harbored *aac(6')-IIc*, *sul1*, and *tet(B)* genes.Two isolates harbored the *qnrB6* gene. There was a high probability that bla_{IMP-1} was carried by IncHI2 plasmids. MLST sequence type of *E. cloacae* isolates comprised three ST78, and one ST997; *K. pneumonia* isolates comprised ST134, and ST252.