Affinergy, Locus, Medical Surface, Inc., Achaogen, Astellas, Arsanis, Bayer, Cubist, Debiopharm, Durata, Grifols, Medicines Co, Novartis: Collaborator, Consultant and Scientific Advisor, Consulting fee, Research grant and Research support.

1040. Comparative Characteristics of Patients With Pseudomonas Bacteremia Receiving Intravenous Only vs. Intravenous Followed by Oral Therapy

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Background. There have been few studies on treatment approaches to *Pseudomonas* bacteremia and transition from intravenous (IV) to oral (PO) therapy. The objective of this study was to determine whether IV to PO switch therapy was associated with worse 30-day mortality than IV only therapy for patients with *Pseudomonas* bacteremia.

Methods. This was a retrospective cohort study comparing patients with ciprofloxacin-susceptible *Pseudomonas* bacteremia treated with IV only to those transitioned from IV to PO switch therapy. We evaluated 153 consecutive patients from January 2008 to October 2017; of those, 119 (78%) had ciprofloxacin-susceptible *Pseudomonas*. We excluded 68 patients due to polymicrobial bacteremia, <3 days, or >21 days of therapy. This left 54 patients for evaluation, 29 of whom received IV only, and 25 with IV to PO switch therapy.

Results. Median patient age was 66 years for both groups. IV only therapy was associated with Hispanic ethnicity (48% vs. 28%, $P = 0.0271$, hospital-acquired infection (52% vs. 13%, $P = 0.0035$), Pitt bacteremia score (median [interquartile range] of 3 [2–3] vs. 1 [0–2], $P = 0.0007$), duration of IV therapy (median [interquartile range] of 11 [7–14] vs. 4 [2–6], $P < 0.0001$), and 30-day mortality (31% vs. 0%, $P = 0.0023$). The IV only group was more likely to have an associated diagnosis of pneumonia (44% vs. 16%, $P = 0.0264$) and less likely to have an associated diagnosis of urinary tract infection (17% vs. 60%, $P = 0.0021$). In a multivariate analysis, with IV only vs. IV to PO switch therapy as the independent variable, mortality as the dependent variable, and pneumonia and UTI as covariates, IV only was independently associated with mortality ($P = 0.0006$).

Conclusion. Patients on IV only therapy were more likely to die at 30 days than those on IV to PO switch therapy, when accounting for differences in diagnosis of pneumonia and UTI, suggesting clinician recognition of increased severity of illness in the IV only group.

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

1041. How Do Healthcare Providers Approach Empiric β-Lactam (BL) Treatment of Bloodstream Infections (BSI) Caused by Gram-Negative Rods (GNRs)? Analysis of *Escherichia coli* and *Klebsiella pneumoniae* BSI From the Veterans Health Administration (VHA)

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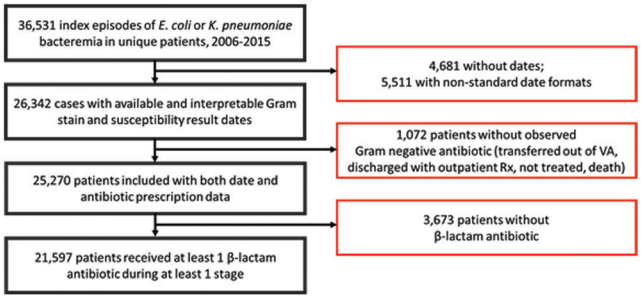
Background. Physicians make decisions regarding antimicrobial chemotherapy based on clinical and demographic factors, choosing initial empiric therapy without knowing the pathogen or its susceptibilities. Given the various treatment options and resistance mechanisms, treatment of GNR BSI is challenging with 30 day mortality approaching 30%. Using a large cohort of *Escherichia coli* and *Klebsiella pneumoniae* BSI, we aimed to characterize empiric antibiotic therapy, comparing treatment before and after Gram stain (GS) results, and summarize clinical outcomes.

Methods. Using a cohort of patients hospitalized within VHA, we used the Corporate Data Warehouse to identify blood cultures positive for *E. coli* or *K. pneumoniae* from 2006 to 2015. We extracted inpatient antimicrobial regimens, demographics, and antibiotic susceptibility testing (AST) results. We excluded cases with missing GS result dates and those not treated with BLs. We defined "initial" empiric treatment as agents received between specimen collection and GS results; and "modified" empiric treatment as agents received after GS but before AST results. Patient characteristics, treatments, and outcomes were summarized overall and by organism.

Results. Of 36,531 BSI identified, we analyzed a subset of 21,597 that met our inclusion criteria (figure). Within this subset of patients, the mean age was 70.3 and all-cause 30-day mortality was 13.9% (2,054 out of 14,735) for *E. coli* and 17.8% (1,220 out of 6,862) for *K. pneumoniae*. Initial empiric treatment included an effective agent in 90.4% (91.2% in *E. coli*, 88.7% in *K. pneumoniae*) of cases. This rate increased to 95.3% (96.0% in *E. coli*, 93.8% in *K. pneumoniae*) for modified empiric treatment. The most commonly prescribed initial empiric BL was piperacillin/tazobactam, observed in 55% of treated patients, followed by ceftriaxone and cefepime in 14% and 11% of treated patients, respectively. Carbapenems were included in 8% of initial and 13% of modified empiric treatments.

Conclusion. In this cohort of older patients with *E. coli* and *K. pneumoniae* BSI, higher rates of effective BL empiric treatment were achieved after GS results. BL empiric regimens consisted mostly of broad-spectrum agents. These observations highlight the potential utility of a diagnostic tool available shortly after specimen collection to inform treatment and improve patient outcomes.



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1042. *Stenotrophomans maltophilia* Bacteremia, A 10-Year Tertiary Center Experience

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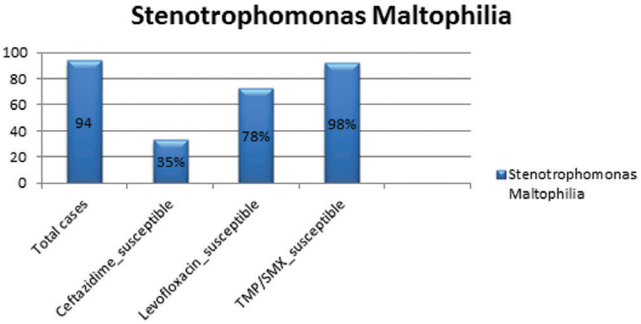
Background. *Stenotrophomonas maltophilia* is a hospital acquired infection that is associated with high morbidity and mortality. There has been a reported rise in *S. maltophilia* infections, presumed secondary to the increase in the population at risk.

Methods. We retrospectively reviewed all hospitalized adult patients in Mayo Clinic, MN with *S. maltophilia* bacteremia from January 2008 through January 2018. We analyzed patient population and described patients at risk, sources of infection, and changes in antimicrobial susceptibility profile.

Results. A total of 94 patients were analyzed, including 52 males, median age of 56 (46–65.75 IQR). The population included 60 infections in those with malignancies and 30 infections in transplant recipients. At presentation, 58 (61.7%) were febrile, while 54 (58.1%) presented with hemodynamic instability. Majority (70.2%) received broad-spectrum antimicrobials within 2 weeks of presentation. The most common source was catheter associated infection ($n = 60$), 15 cases were secondary to gastrointestinal, and 9 due to a pulmonary source. Almost half, 46 (48.9%) required ICU admission. Two patients were diagnosed with endocarditis. Most isolates, 61(64.9%), were resistant to ceftazidime, 2 (2.2%) resistant to TMP/SMX and 20 (21.5%) were resistant to levofloxacin. Exposure to a quinolone in the 30 days prior to presentation did not impact fluoroquinolone resistance. Five patients were exposed to Trimethoprim/Sulfamethoxazole (TMP/SMX) in the 30 days prior to presentation, which was associated with higher rate of TMP/SMX resistance compared with those without exposure (80% vs. 98.8%, $P = 0.004$). Treatment options commonly included combination therapy, and TMP/SMX was a primary agent used in the majority, 59 (62.8%). All-cause in-hospital mortality was 26.6%. All-cause mortality was lower for line associated infections (16.67%) vs. other sources (44.12%) with $P = 0.0038$.

Conclusion. *S. maltophilia* bacteremia should be considered in hospitalized patients with recent use of broad-spectrum antibiotics. Although TMP/SMX continues to have reliable activity, use of empiric ceftazidime pending susceptibility testing should be avoided as trend toward increasing resistance is noted. We noted a drop in TMP/SMX susceptibility in those with recent reported TMP/SMX use.



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

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.

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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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.