Disclosures. **E. Molnar**, Merck: Grant Investigator, Research grant. **J. Gallagher**, Merck: Consultant, Grant Investigator, Scientific Advisor and Speaker's Bureau, Consulting fee, Educational grant and Speaker honorarium. Allergan: Scientific Advisor and Speaker's Bureau, Consulting fee and Speaker honorarium. Astellas: Scientific Advisor and Speaker's Bureau, Consulting fee and Speaker honorarium. Achaogen: Scientific Advisor, Consulting fee. Cidara: Consultant, Consulting fee. Theravance: Scientific Advisor, Consulting fee. Paratek: Scientific Advisor, Consulting fee. The Medicines Company: Scientific Advisor, Consulting fee.

790. Treatment of Carbapenem-Resistant Enterobacteriaceae Infections with Ceftazidime-Avibactam

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Session: 76. Treatment of Resistant Infections - Clinical Analyses
Thursday, October 5, 2017: 12:30 PM

Background. CRE is an urgent threats to public health with a high mortality estimated at >30–50%. Until recently, polymyxin-based antibiotics were the only available options. However, a new therapeutic option has become available: ceftazidime-avibactam. We sought to describe outcomes from these infections treated with ceftazidime-avibactam.

Methods. From 9/2015 to 12/ 2016, we reviewed charts of 11 patients infected with CRE who received ceftazidime-avibactam at USC (Los Angeles, CA). Sixteen isolates analyzed. All isolates were resistant to meropenem (MIC ≥ 16). Carbapenemase production confirmed by detection of bla_{KPC}. Clinical success defined as clinical improvement, lack of recurrence, and survival in 90 days. Recurrence defined as clinical signs of infection and recovery of CRE after ≥ 7 days of treatment.

Results. The median age was 49 (35-89); 73% (7/11) female; and 27% (3/11) solid organ transplants. All CRE infections caused by *Klebsiella pneumoniae*. All sequence type 258, 7/11 harboring bla_{KPC-2} and 4/11 bla_{KPC-3}. Nine capsular type wzi-154 and 2 wzi-29. qSOFA score was 0 (0–2) predicting mortality of 3%. Seven had intraabdominal infections; 2 pyelonephritis, 1 skin and soft-tissue infection, and 1 primary bacteremia. There were five episodes of secondary bacteremia. The patients were treated for a median duration of 15 (3-43) days. All received other antibiotics prior to ceftazidime-avibactam. Eighty-seven percent (9/11) treated with monotherapy and 13% (2/11) in conjunction with colistemethate sodium. 27% (3/11) were receiving CRRT or hemodialysis during treatment. No incidents of renal toxicity observed using RIFLE criteria. Clinical success was 73% (8/11); 30 day survival rate 82% (9/11); 90 day survival rate 73% (8/11); and in hospital mortality 27% (3/11). Patients receiving CRRT or hemodialysis had 75% (3/4) mortality ($P = 0.02$). Recurrence occurred in 18% (2/11). Decreased sensitivity to ceftazidime-avibactam noted in one patient. 27% (3/11) had CRE isolated after ≥ 7 days treatment.

Conclusion. In CRE-infected patient treated with ceftazidime-avibactam, the overall mortality rate was 27% with the highest mortality among those receiving renal replacement therapy which was comparable to a prior studies. Additional research is needed to optimize the use of ceftazidime-avibactam to treat CRE infections.

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

791. Health Outcomes from Multi-Drug-resistant *Salmonella* Infections in High-Income Countries: A Systematic Review and Meta-Analysis

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Session: 76. Treatment of Resistant Infections - Clinical Analyses
Thursday, October 5, 2017: 12:30 PM

Background. *Salmonella* is a leading cause of foodborne enterocolitis worldwide. Nontyphoidal *Salmonella* (NTS) infections that are Multi-Drug-resistant (MDR) (non-susceptible to ≥1 agent in ≥3 antimicrobial categories) may result in more severe health outcomes, although these effects have not been systematically examined. We conducted a systematic review and meta-analysis to examine impacts of MDR NTS on disease outcomes in high-income settings.

Methods. We systematically reviewed the literature from scientific databases, including PubMed, Scopus and grey literature sources, using Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. We included case–control studies, cohorts, outbreaks, and theses, imposing no language restriction. We included only publications from 1 January 1990 through 15 September 2016 from high-income countries as classified by the World Bank, and extracted data on duration of illness, hospitalization, morbidity and mortality of MDR and susceptible NTS infections.

Results. After we removed duplicates, the initial search revealed 4 258 articles. After further screening, we identified 16 eligible studies for the systematic review, but due to inconsistency in the compared groups, only 9 of these were included in the meta-analysis. NTS serotypes differed among the reported studies but serotypes Typhimurium, Enteritidis, Newport, and Heidelberg were the most often reported MDR pathogens. *Salmonella* infections that were MDR were associated with excess bloodstream infections (OR 1·73; 95% CI 1·32–2·27), excess hospitalizations (OR 2·51; 95% CI 1·38–4·58), and higher mortality (OR 3·54; 95% CI 1·10–11·40).

Conclusion. The results of this meta-analysis suggest that MDR NTS infections have more serious health outcomes compared with susceptible isolates. With the emergence of MDR *Salmonella* strains in high-income countries, it is crucial to restrict the use of antimicrobials in animals and humans, and intervene to prevent foodborne infections.

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

792. Comparison of Rates of Acute Kidney Injury with Vancomycin/Piperacillin-Tazobactam vs. Vancomycin/Meropenem Combination Therapy

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Session: 76. Treatment of Resistant Infections - Clinical Analyses
Thursday, October 5, 2017: 12:30 PM

Background. Vancomycin is historically correlated with renal toxicity, especially in conjunction with other nephrotoxins. Recent reports have identified nephrotoxicity associated with vancomycin in conjunction with β-lactam antibiotic therapy, reporting increased rates of acute kidney injury (AKI) with vancomycin/piperacillin-tazobactam (VPT) therapy as compared with vancomycin monotherapy. Similarly, increased rates of AKI have been reported with VPT as compared with vancomycin/cefepime. Little data exists comparing VPT to the combination of vancomycin/meropenem (VM). The purpose of this study was to compare the incidence of nephrotoxicity between these two antibiotic combinations.

Methods. A single-center cohort study was performed at a large tertiary care community hospital utilizing retrospective review of electronic medical records. Adult in-patients treated from June to October of 2015 were included. Evaluable patients received at least 48 hours of either VPT or VM combination therapy and were followed for up to 10 days of combination therapy. Data collection included patient demographics, AKI risk factors, days of antibiotic therapy, and serum creatinine. The primary endpoint was incidence of AKI as defined by the Kidney Disease Improving Global Outcomes (KDIGO) criteria. Secondary endpoints included time to AKI and incidence of new dialysis treatment.

Results. Of 564 patients screened, a total of 202 patients met inclusion criteria, with 101 patients in each combination therapy group. Baseline serum creatinine and estimated creatinine clearance were not different between groups. The incidence of AKI was higher in the VPT group as compared with the VM group (17.82% vs. 4.95%, respectively, $P = 0.004$). Time to AKI onset was longer in the VPT group compared with the VM group (3.2 days vs. 1.4 days, $P = 0.045$). Patients in the VM group had a higher incidence of ICU admissions (56.4% vs. 40.6%, $P = 0.024$) and mean arterial pressure (MAP) less than 65mmHg (60.4% vs. 44.6%, $P = 0.029$). No patients in either group required new dialysis therapy.

Conclusion. Despite a greater incidence of AKI risk factors in the VM group, VPT therapy was associated with an increased risk of AKI as compared with VM therapy. Prospective studies are needed to further evaluate this finding.

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

793. Risk Factors and Outcomes of Vancomycin-Resistant vs. Vancomycin-Sensitive *Enterococcal* Blood Stream Infections in Patients with Acute Myeloid Leukemia

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Session: 76. Treatment of Resistant Infections - Clinical Analyses
Thursday, October 5, 2017: 12:30 PM

Background. Enterococci are commensal of the gastrointestinal tract known to cause blood stream infections (BSIs). Studies have shown increased mortality from *enterococcal* BSI in neutropenic patients, indicating Vancomycin-resistant *Enterococcal* (VRE) infections causing increased mortality. Whether these differences in mortality apply to AML patients is unknown. The objectives of this study are to compare the risk factors and outcomes between VRE & VSE BSIs in AML patients.

Methods. We conducted a single center, retrospective cohort study of patients with *enterococcal* BSIs at H. Lee Moffitt Cancer Center from July 2011 to October 2015. Records were searched to identify AML patients with *enterococcal* BSI. *Enterococcal* species, neutropenia duration, Vancomycin exposure, VRE colonization, 7 and 30 day mortality, age, sex, length of stay, stem cell transplant & central line status were compared. We conducted statistical tests and Kaplan-Meier plot to analyze mortality trends.

Results. There were a total of 77 AML patients with *enterococcal* BSI. Forty-two (54.5%) were caused by VRE. *E. faecalis* and *E. faecium* accounted for 28.5% and 62.3% of BSI respectively. The *E. faecalis* isolates were more likely to be VSE (83% vs. 8.3 %, $P < 0.001$) and *E. fecium* isolates to be VRE (71% vs. 29%, $P < 0.001$). Duration of neutropenia was significantly longer (27.3 vs. 20.7 days, $P < 0.005$) among AML patients with VRE BSI. Recent Vancomycin use and VRE colonization were significantly associated