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Background. The aim of this study is to describe the clinical manifestations, molecular mechanisms, and treatment outcomes of patients with echinocandin-resistant *Candida tropicalis* (*C. tropicalis*) bloodstream infections (BSI).

Methods. A PubMed search was conducted using the search terms related to *C. tropicalis* BSI and echinocandin resistance. Two previously unreported cases from our institution diagnosed with *C. tropicalis*BSI that developed resistance to echinocandins were also included. Demographics, comorbidities, treatment, clinical outcomes, and molecular mechanisms were analyzed.

Results. Seven patients with echinocandin-resistant *C. tropicalis* BSI were identified, including 5 previously reported cases and two from our institution. Median age was 58.7 ± 20.4 years; 3 (43%) patients were males. Three (43%) had acute myelogenous leukemia, 3 (43%) had acute lymphoblastic leukemia, and 1 (14%) had urothelial cancer. All patients were immunocompromised having received chemotherapy in the last six months and 3 (43%) were hematopoietic stem cell transplant recipients. Five (71%) had breakthrough of echinocandin resistance while receiving an echinocandin; one (14%) received caspofungin in the past 3 months and only one (14%) had no reported echinocandin exposure in the past 3 months.

DNA sequencing of the *FKS1* gene for mutations known to confer echinocandin resistance was performed in 4 cases, including our two index cases. Homozygous T-to-C mutations in two alleles of *FKS1*gene was detected in 2 cases, and a heterozygous mutation was detected in the other 2 cases, which resulted in a deduced serine-to-proline amino acid change at position 654 (S654P).

Six patients (86%) survived after being treated with an antifungal agent other than an echinocandin. Treatment was changed to liposomal amphotericin B in two cases, and one each to voriconazole, fluconazole, voriconazole plus liposomal amphotericin B, and caspofungin plus voriconazole. The one patient who died received intravenous voriconazole.

Conclusion. Echinocandin resistance emerged in neutropenic patients with *C. tropicalis* fungemia through a characteristic mutational hot-spot amino acid change in the target *FKS1* gene. Although alternative antifungal agents may be successfully used as salvage therapy, the outcome may still be fatal.

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788. Factors Associated with Mortality in Carbapenem-Resistant *Enterobacteriaceae* Bacteremia: Focus on Antibiotic Therapy

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Background. Infections caused by carbapenem resistant *Enterobacteriaceae* (CRE) are associated with high mortality. Optimal treatment for CRE bacteremia remains unclear, including the role of combination therapy, carbapenem-containing regimens, or newer antimicrobials, such as ceftazidime-avibactam (CAZ-AVI). The objective of this study was to evaluate risk factors associated with mortality in patients with CRE bacteremia, with a focus on antimicrobial therapy.

Methods. This was a multicenter, retrospective cohort study of inpatients within Carolinas HealthCare System who had a positive blood culture with CRE (*Klebsiella* spp., *Enterobacter* spp., or *Escherichia coli)* between January 1, 2010 and September 30, 2016. CRE isolates were identified as pathogens with an ertapenem MIC ≥ 1 mcg/mL. The primary endpoint was death within 28 days after the first positive blood culture in patients with CRE bacteremia. Clinical variables, including the use of specific antimicrobials and combination therapy, were compared between 28-day survivors vs. non-survivors.

Results. A total of 73 patients were included with CRE bacteremia. The most common sources of infection identified were urine (42.5%) and intra-abdominal (38.4%). The overall 28-day mortality was 26%. Fifty-three (72.6%) patients received combination antibiotic therapy and 20 (27.4%) received monotherapy. Combination therapy with *in vitro* active agents (36.8% vs. 33.3%, $P = 0.87$) and the use of carbapenem-containing regimens (47.4% vs. 46.3%, $P = 0.74$) did not differ between those who died and survived, respectively. One patient treated with CAZ-AVI as monotherapy died, but only eight patients received this antibiotic. There was a trend towards higher use of tigecycline in the group that died compared with the group that survived (73.7% vs. 59.3%, $P = 0.26$).

Conclusion. There did not appear to be a difference in mortality at 28 days with the use of combination therapy or a carbapenem-containing regimen. While a statistically significant difference was not demonstrated, tigecycline-containing regimens may be associated with increased mortality in the treatment of CRE bacteremia. Larger prospective studies are necessary to further elucidate the role of combination therapy and newer agents, such as CAZ-AVI, in this patient population.

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789. Ceftolozane-tazobactam for the Treatment of Multi Drug-resistant *Pseudomonas aeruginosa* (MDRPA) Infections

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Background. Ceftolozane-tazobactam (TOL-TAZ) is a novel cephalosporin/β-lactamase inhibitor combination with potent activity against *Pseudomonas aeruginosa*, including MDRPA. TOL-TAZ use for MDRPA infections has not been well-studied.

Methods. We conducted a retrospective study to describe outcomes of patients treated with TOL-TAZ for MDR *Pseudomonas aeruginosa* infections at 3 academic medical centers. Patients were age ≥ 18 years who had MDRPA isolated in culture and received TOL-TAZ for at least 24 hours. The primary outcomes were 30-day and in-hospital mortality. Secondary outcomes were microbiological cure and clinical success. Microbiological cure was defined as negative culture at end of therapy; cure was presumed when clinical success occurred without follow-up cultures. Clinical success was defined as resolution of all signs and symptoms of infection. TOL-TAZ susceptibility results were collected when available.

Results.

Characteristics	Results (*N* = 34)
Male gender, n(%)	21 (61.8)
Age (median, IQR)	57 (42-66)
Charlson Comorbidity Index (median, IQR)	4 (2.25-5)
APACHE II score (median, IQR)	20 (13-26.8)
ICU, n(%)	23 (67.7)
Solid organ transplant recipient, n(%)	15 (44.1)
Primary infection, n(%)	
Pneumonia	22 (64.7)
Bacteremia	6 (17.6)
Urinary tract	4 (11.8)
Wound	4 (11.8)
Intra-abdominal	2 (5.8)
Hospital day index infection diagnosed (median, IQR)	8 (1-35)
Hospital day TOL-TAZ started (median, IQR)	18.5 (3-52)
Patients receiving concomitant therapy for index pathogen, n(%)	20 (58.8)
Isolates susceptible to TOL-TAZ, n/N (%)	16/17 (94)
30-day mortality, n (%)	7 (20.6)
In-hospital mortality, n(%)	8 (23.5)
Microbiologic cure, n(%)	21 (61.8)
Clinical success, n(%)	24 (70.6)

Conclusion. In this severely ill population with MDRPA infections, 79.4% and 76.5% of patients were alive at 30-days and at the end of their stay, respectively. Some patients had positive cultures despite clinical resolution. TOL-TAZ is a potential option for patients with MDRPA infections.

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

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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.

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

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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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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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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