2427. Comparison of Ceftazidime–Avibactam and Ceftazidime–Tazobactam In Vitro Activities When Tested Against Gram-Negative Bacteria Isolated From Patients Hospitalized With Pneumonia in US Medical Centers (2017)

Helo S. Sader, MD, PhD; Robert K. Flamm, PhD; and Mariana Castanheira, PhD.

TMD Laboratories, North Liberty, Iowa, United States Committee on Antimicrobial Susceptibility Testing, Silverton, Oregon, TMD Laboratories, Inc., North Liberty, Iowa

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Background. We evaluated Enterobacteriaceae (ENT) and P. aeruginosa (PSA) antimicrobial susceptibility patterns isolated from patients with pneumonia, including ventilator-associated pneumonia (VAP), and compared the in vitro activity of ceftazidime–avibactam (CAZ-AVI) and ceftazidime–tazobactam (CAZ-T) against various resistant (R) subsets.

Methods. Clinical isolates consecutively collected (1/patient) from 70 US medical centers in 2017 by the INFORM Program were susceptibility (S) tested against CAZ-AVI, and CAZ-T, and compared at a central laboratory by reference broth microdilution methods. The organism collection included 1,865 ENT and 1,337 PSA isolates.

Results. The most active agents against ENT were CAZ-AVI (99.95%; table), amikacin (AMK; 98.76%), the carbapenems meropenem (MEM) and doripenem (97.36%), and tigecycline (TGC; 94.16%), but only CAZ-AVI and TGC retained good activity (≥90%S) against carbenem-resistant ENT (CRE; 98.08% and 90.08%, respectively). The most active agents against multidrug-R (MDR) ENT were CAZ-AVI (99.66%) and AMK (90.66%), whereas CAZ-T and MEM were active against only 55.2% and 77.7% of these organisms, respectively; CAZ-AVI was the most active agent tested against extensively drug-R (XDR) ENT (CAZ-AKI) followed by AMK (73.26%) and TGC (65.96%). Among Klebsiella spp. with an ESBL phenotype, S to CAZ-AVI and T-MEM and were 100.0% 68.4%, and 98.6% respectively. CAZ-AVI and CAZ-T were very active against PSA and exhibited similar activity against these organisms (96.2% and 95.6%, respectively), including an ENT strain with an ESBL (MEM: S: 98.81% and 99.68%), and XDR (79.4% and 80.4%) isolates (table). Among PSA isolates NS to CAZ, MEM and piperacillin–tazobactam (P-T), S to CAZ-AVI, C-T, and AMK were 73.7%, 76.6% and 82.6%, respectively. All PSA isolates were colistin-S. Among isolates from VAP, S to CAZ-AVI and C-T were 100.0% and 90.0% for ENT (n = 266), and 97.8% and 99.5% for PSA (n = 183), respectively.

Conclusion. CAZ-AVI and CAZ-T showed similar coverage (%S) against PSA (96.2–96.56%), including against MDR (84.9–86.4%) and XDR (79.4–80.4%) isolates. In contrast, CAZ-AVI was less active than CAZ-AVI against ENT in general and exhibited limited activity against ENT-R subsets.

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2428. Lower Rates of Antibiotic Treatment of Vancomycin-Resistant Compared With Vancomycin Susceptible Enterococcal Bacteriuria

Bridge Vendittielli, PharmD; Pramodini K. Shankar, PharmD; and John Habib, PharmD, FIDP, FCCP.

Pharmacy, St. John Hospital and Medical Center, Detroit, Michigan, Wayne State University, Detroit, Michigan, Infectious Diseases, Saint John Hospital and Medical Center, Ascension, Grosse Pointe Woods, Michigan

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Background. According to the IDSA guidelines, most asymptomatic bacteruria should not be treated. The identification of drug resistance often leads to inappropriate antibiotic prescribing. We evaluated prescribing patterns of vancomycin-resistant enterococci (VRE) and vancomycin-susceptible enterococci (VSE) at a regional health system to determine whether the rates did differ by institution.

Methods. This is a retrospective chart review of all adult inpatients at the St. John Providence Health System (SJPHS) with positive urine culture identified as VRE or VSE between April 1, 2017 and October 1, 2017. The groups were matched to hospital location, age within 5 years and gender. Patients with medical records that were not available were excluded. Patient demographics (age, sex, location of treatment, hospitalization days, location of treatment) and the duration of treatment were collected. Bacteriuria was defined as a UTI if there was fever or entercoccal bacterium. We evaluated frequency of treatment as well as type and duration of antibiotic treatment.

Results. 108 patients with VRE bacteriuria at SJPHS were identified and 106 met our inclusion criteria. 1,304 of VSE bacteriuria at SJPHS were identified and 106 were matched. The mean age was 74.0 and 71.3 (P = 0.476) in the VRE and VSE groups respectively and each group had 35.8% males. The table below depicts the number of patients with VRE/VSE being treated by institution.

| Site                  | Included | ID Consult | Number Treated | Fever | (±) BCx | Median length of Rx (days) |
|-----------------------|----------|------------|----------------|-------|--------|--------------------------|
| Hospital 1            | 22/22    | 27/16      | 5/4            | 8/4   | 2/2    | 7/15                     |
| Hospital 2            | 47/41    | 40/27      | 15/21          | 8/5   | 0/0    | 7/7                      |
| Hospital 3            | 7/5/6    | 3/2/3      | 1/2            | 0/2   | 0/0    | 7/13                     |
| Hospital 4            | 22/22    | 16/13      | 5/12           | 3/3   | 0/1    | 7/7                      |
| Hospital 5            | 10/10    | 9/5        | 4/6            | 2/3   | 0/0    | 6/5/8                    |
| Total                 | 106/106  | 89/62      | 30/45          | 23/6  | 2/7    |                          |

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2429. The Epidemiology and Outcomes of Enterobacter cloacae Bloodstream Infections in Children

Brandon Kulengowski, PharmD, MS; Gretchen Ingling, PharmD Candidate; Kristen E. Willitt, PharmD Candidate and David S. Burgess, PharmD, FCCP, FIDP, University of Kentucky, College of Pharmacy, Lexington, Kentucky

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Background. Bloodstream infections cause significant morbidity and mortality in children admitted to intensive care units (ICUs). Enterobacter cloacae bloodstream infections are particularly alarming due to the increasing resistance and presence of inducible β-lactamases on some strains. The objective of this study was to describe the epidemiology and clinical outcomes for critically ill children with E. cloacae bloodstream infections.

Methods. We performed a retrospective cohort study of children ≥19 years hospitalized in the critical care unit at the Children National Medical Center in Washington, DC with E. cloacae bloodstream infections between 2017 and 2016. We excluded polymicrobial infections. We performed chart review to collect baseline characteristics, treatment regimens, and outcomes. Recurrence of infection was defined as new E. cloacae bacteremia within 30 days of discontinuing antibiotics for initial infection.

Results. Twenty-six episodes of E. cloacae bacteremia met inclusion criteria. Median age was 7 months (IQR 2–16 months), and 62/23% patients were African-American. All patients had at least one underlying chronic medical condition, the most common being neuromuscular (35%), end-stage renal disease (27%), oncologic (12%), and short bowel syndrome (15%). Central venous catheter was present in 18 (75%) patients and 10 (38%) had hemodynamic instability requiring vasopressor support at time of bacteremia. Seven isolates (27%) were not susceptible to third-generation cephalosporins. Antibiotic treatment varied, with 7 (27%) receiving carbapenems empirically within 72 hours. Mean duration of bacteremia was 2.9 days. Infection recurred within 30 days in 2 patients (8%) and 2 patients (8%) died within 30 days of the initial positive blood culture.

Conclusion. All episodes of E. cloacae bacteremia occurring in children admitted to the ICU occurred in patients with underlying comorbid conditions, and more than half of affected children were infants <1 year. More than one-third of these infections were associated with severe sepsis and nearly one in ten infected patients died within one month.

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2430. Impact of USCAST Proposed Breakpoint Changes to Aminoglycosides, Cycles, and Levofloxacin on Carbapenem-Resistant Enterobacteriaceae at a US Tertiary Referral Academic Medical Center

Brandon Kulengowski, PharmD, MS; Gretchen Ingling, PharmD Candidate; Kristen E. Willitt, PharmD Candidate and David S. Burgess, PharmD, FCCP, FIDP, University of Kentucky, College of Pharmacy, Lexington, Kentucky

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Background. USCAST is one of many national committees that establish standards for testing and interpreting antimicrobial susceptibility. While working closely with EUCAST, USCAST has proposed updated breakpoints for the aminoglycosides, fluoroquinolones, and tigecycline and is discussing updated breakpoints for the tetracycline antimicrobials. A majority of US hospitals currently utilize FDA or CLSI break points. This study sought to determine the impact of the proposed updated breakpoints on a population of carbapenem-resistant Enterobacteriaceae at a US tertiary referral academic medical center.

Methods. Carbapenem-resistant Enterobacteriaceae (n = 122) from January 2012 to January 2017 were identified as part of routine patient care for study inclusion. Amikacin, gentamicin, tobramycin, levofloxacin, minocycline and tigecycline were evaluated in duplicate on at least two separate occasions by broth microdilution according to CLSI guidelines. The most conservative minocycline breakpoint (≥1 mg/L) being discussed by USCAST was utilized for analysis. McNemar’s test determined significant susceptibility changes between USCAST and FDA/CLSI breakpoints for all CRE and for K. pneumoniae and Enterobacter spp.