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

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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 ceftolozane–tazobactam (C-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, C-T, and comparators 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 (99.9%S; table), amikacin (AMK; 98.7%S), the carbapenems meropenem (MEM) and doripenem (97.3%S), and tigecycline (TGC; 94.1%S), but only CAZ-AVI and TGC retained good activity (≥90%S) against carbepenem-R ENT (CRE; 98.0% and 90.0%S, respectively). The most active agents against multidrug-R (MDR) ENT were CAZ-AVI (99.6%S) and AMK (90.6%S), whereas C-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 (97.6%S) followed by AMK (73.2%S) and TGC (65.9%S). Among *Klebsiella* spp. with an ESBL phenotype, S to CAZ-AVI, C-T and MEM were 100.0%, 68.4%, and 83.9%, respectively. CAZ-AVI and C-T were very active against PSA and exhibited similar coverage against these organisms (96.2%S and 96.5%S, respectively), including MEM-non-S (NS; 88.1%S and 89.4%S), MDR (84.9%S and 86.4%S), and XDR (79.4%S and 80.4%S) 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 90.2% for ENT (n = 266), and 97.8% and 99.5% for PSA (n = 183), respectively.

Conclusion. CAZ-AVI and C-T showed similar coverage (%S) against PSA (96.2–96.5%S), including against MDR (84.9–86.4%S) and XDR (79.4–80.4%S) isolates. In contrast, C-T was less active than CAZ-AVI against ENT in general and exhibited limited activity against ENT-R subsets.

Organism / resistant subset (no.)	MIC_{50}/MIC_{90} in µg/mL (%S)			
	CAZ-AVI	C-T	P-T	MEM
Enterobacteriaceae (1,865)	0.12/0.5 (99.9)	0.25/2 (90.3)	2/64 (86.5)	0.03/0.06 (97.3)
CRE (50)	1/2 (98.0)	>16/>16 (4.0)	>128/>128 (4.0)	16/>32 (4.0)
MDR (224)	0.25/2 (99.6)	2/>16 (55.2)	32/>128 (44.6)	0.06/16 (77.7)
XDR (41)	1/2 (97.6)	>16/>16 (24.4)	>128/>128 (17.1)	8/>32 (31.7)
P. aeruginosa (1,337)	2/8 (96.2)	0.5/2 (96.5)	8/128 (74.8)	0.5/16 (71.1)
MER-NS (386)	4/16 (88.1)	1/8 (89.4)	32/>128 (42.5)	--
MDR (331)	4/16 (84.9)	2/8 (86.4)	64/>128 (23.0)	8/32 (18.1)
XDR (204)	4/16 (79.4)	2/16 (80.4)	128/>128 (9.3)	16/32 (9.3)

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

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Background. According to the IDSA guidelines, most asymptomatic bacteriuria 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 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 patient (institution), ID consult, fever, treatment, antibiotic class and the duration of treatment was collected. Bacteriuria was defined as a UTI if there was fever or enterococcal bacteremia. We evaluated frequency of treatment as well as type and duration of antibiotics.

Results. 208 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 70.4 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	20/14	5/4	8/4	2/2	7/14.5
Hospital 2	47/47	40/27	15/21	8/5	0/0	7/7
Hospital 3	5/5	4/3	1/2	2/0	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	6.5/8.5
Total	106/106	89/62 ($P < 0.0001$)	30/45 ($P = 0.0085$)	23/15 ($P = 0.21$)	2/3	7/7

Therapy for VRE was diverse among most institutions and included agents such as daptomycin, β-lactams, doxycycline, fosfomycin, nitrofurantoin and linezolid. Hospital 2 had a total of 15 treated cases; 11 of which were treated with linezolid. Therapy for VSE primarily consisted of β-lactam or vancomycin.

Conclusion. The rates of treatment were higher with VSE compared with VRE. ID was more frequently consulted in patients with VRE and those patients were treated less frequently.

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

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Background. Bloodstream infections cause significant morbidity and mortality in children admitted to intensive care units (ICUs). *Enterobacter cloacae* bloodstream infections can be particularly challenging to treat given increasing antibiotic 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 2007 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 6/26 (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, Cyclines, and Levofloxacin on Carbapenem-Resistant *Enterobacteriaceae* at a US Tertiary Referral Academic Medical Center

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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 breakpoints. 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.*