1592. *In Vitro* Activity of Ceftolozane/Tazobactam (C/T) Against *Enterobacteriaceae* and *Pseudomonas aeruginosa* Circulating in Chile

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Session: 162. PK/PD and Susceptibility Testing
Friday, October 4, 2019: 12:15 PM

Background. The widespread dissemination of carbapenem-resistant (CR) *P. aeruginosa* and *Enterobacteriaceae* has created a major global public health crisis. C/T is a recently approved therapeutic which consists of the combination of a novel cephalosporin (ceftolozane) and tazobactam (a β-lactamase inhibitor). C/T has shown good activity against a wide range of multidrug-resistant (MDR) Gram negatives, being particularly interesting as an alternative for MDR *P. aeruginosa*. We aimed to determine the activity of C/T against clinical strains of *Enterobacteriaceae* and *P. aeruginosa* recovered in 4 large clinical centers from Chile.

Methods. We analyzed 434 isolates of *Enterobacteriaceae* (347 *E. coli*, 66 *K. pneumoniae*, 21 *Enterobacter cloacae* complex) and 57 *P. aeruginosa* collected during 2017 from 4 tertiary care institutions in Santiago, Chile. Identification was performed as per each local clinical microbiology lab. Susceptibility testing was performed by broth microdilution using customized Sensititre plates (Trek). Carba-NP was performed to screen for carbapenemase production. Susceptibilities were analyzed as per 2019 CLSI breakpoints.

Results. The MIC50/90 for C/T against *Enterobacteriaceae* and *P. aeruginosa* were 1/4 µg/mL and 2/16 µg/mL, respectively. In *Enterobacteriaceae*, susceptibility to C/T reached 92% in *E. coli* (Figure 1A), 91% in *E. cloacae* complex (Figure 1B) and 70% in *K. pneumoniae* (Figure 1C). Remarkably, C/T remained active against 58% (33/57) of CR *Enterobacteriaceae* (Figure 2A). Among Carba-NP-negative CR isolates (46%, 26/57), susceptibility to C/T was 54% (Figure 3 A–C). In *P. aeruginosa*, the overall susceptibility to C/T was 81% (Figure 1D), maintaining activity against 69% (25/36) of CR strains (Figure 2B). Importantly, susceptibility to C/T in CR *P. aeruginosa* isolates with a negative Carba-NP (67%, 24/36) was 83% (20/24) (Figure 3D).

Conclusion. In this multicenter study, we observed that C/T was highly active against clinical isolates of *Enterobacteriaceae* and *P. aeruginosa*. Of note, C/T remained active against a large proportion of CR clinical strains. Moreover, the activity of C/T was particularly high against CR *P. aeruginosa* isolates with a negative Carba-NP.

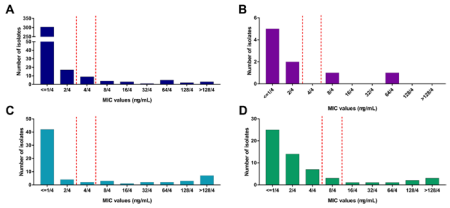

Figure 1. Distribution of ceftolozane/tazobactam MICs for the clinical isolates evaluated. MICs were determined by Sensititre™. MICs of *E. coli* (A) *E. cloacae* complex (B), K. pneumoniae (C), and *P. aeruginosa* (D) are shown. Dashed lines indicate the CLSI-2019 interpretation breakpoints. The Y-axis shows the number of isolates for each MIC value and the X-axis shows each MIC value (µg/mL).

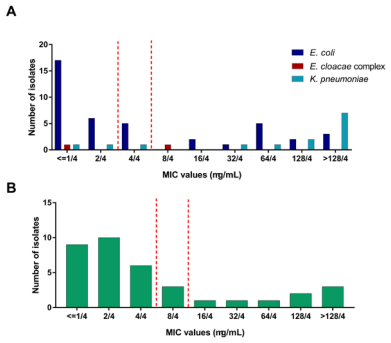

Figure 2. Distribution of ceftolozane/tazobactam MICs for the carbapenem-resistant clinical isolates. MICs were determined by Sensititre™. MICs of *Enterobacteriaceae* (A) and *P. aeruginosa* (B) are shown. Dashed lines indicate the CLSI-2019 interpretation breakpoints. The Y-axis shows the number of isolates for each MIC value and the X-axis shows each MIC value (µg/mL).

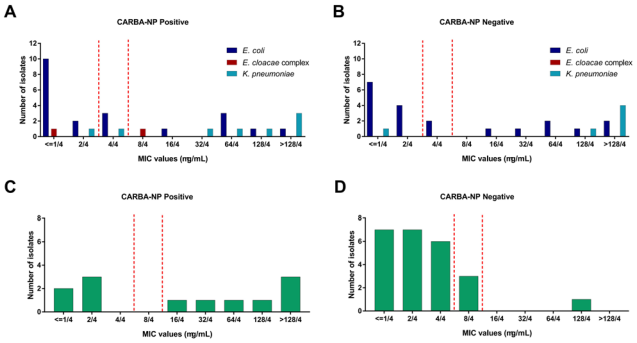

Figure 3. Distribution of ceftolozane/tazobactam MICs for the carbapenem-resistant clinical isolates according to CARBA-NP result. MICs were determined by Sensititre™. MICs of *Enterobacteriaceae* and *P. aeruginosa* for CARBA-NP positive (A and C, respectively) and CARBA-NP negative (B and D, respectively) are shown. Dashed lines indicate the CLSI-2019 interpretation breakpoints. The Y-axis shows the number of isolates for each MIC value and the X-axis shows each MIC value (µg/mL).

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

1593. Analysis of Hospital Antimicrobial Susceptibility Test Results for Patterns of Antibiotic Resistance

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Session: 162. PK/PD and Susceptibility Testing
Friday, October 4, 2019: 12:15 PM

Background. Antimicrobial susceptibility tests (ASTs) are routinely performed on pathogens isolated from clinical samples. ASTs are used by clinicians to select the most appropriate treatment for antibiotic-resistant microorganisms. In aggregate, ASTs offer insight into the rise and spread of antibiotic resistance across hospitals. Here, we used ASTs to identify patterns of antibiotic resistance across drugs and microorganisms.

Methods. We conducted a retrospective analysis of 364,813 AST results from the University of Pittsburgh Medical Center from 2015 to 2018. Data regarding infection site, hospital laboratory testing, organism identification, and antibiotic susceptibilities were extracted from the laboratory information system and anonymized prior to use. The pathogens studied included *Escherichia coli, Klebsiella pneumoniae, Pseudomonas aeruginosa, Acinetobacter baumannii, Staphylococcus aureus, Proteus mirabilis,* and *Enterococcus faecalis.*

Results. We identified 21 antibiotic-pathogen combinations where resistance was found in less than 1% of AST results. Concordant susceptibility results of levofloxacin and ciprofloxacin occurred the most frequently among antibiotic pairs. Additionally, concordant susceptibility results were more common within antibiotics belonging to the same antibiotic class than between classes. *P. aeruginosa* had the highest rate of overall concordant results with concordance occurring within all -lactam classes. In contrast, *K. pneumoniae* and *P. mirabilis* showed the least concordance, suggesting that their resistance profiles are less predictable. Notably, we did not identify any pairs of antibiotics that strongly exhibited discordant susceptibility results regardless of the microorganism.

Conclusion. Using routinely collected clinical microbiological data, we were able to characterize pathogen-antibiotic combinations where resistance is rarely seen. Additionally, we identified pairs of antibiotics that frequently exhibited concordance susceptibilities both within and between classes. Lastly, we were unable to find evidence of discordant susceptibility results, indicating that more clinical research is needed to determine the efficacy of collateral sensitivity treatment techniques.

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

1594. Ceftolozane–Tazobactam Demonstrates Higher *In Vitro* Susceptibility than Ceftazidime–Avibactam Against *Pseudomonas aeruginosa* Isolated from Respiratory Tract of Adult Cystic Fibrosis Patients

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Session: 162. PK/PD and Susceptibility Testing
Friday, October 4, 2019: 12:15 PM

Background. *Pseudomonas aeruginosa* is a commonly isolated pathogen in adults with cystic fibrosis (CF). Antimicrobial resistance is an escalating problem due to chronic colonization and frequent antimicrobial exposure. Ceftolozane–tazobactam (C/T) and ceftazidime–avibactam (CZA) exhibit promising activity against antimicrobial-resistant organisms, including *P. aeruginosa.* In this study, we compared *in vitro* activity of C/T and CZA against *P. aeruginosa* isolated from respiratory cultures obtained from adult patients with CF.

Methods. This is a retrospective study of respiratory cultures positive for *P. aeruginosa* collected from adult CF patients between January 1, 2015 to November 30, 2018. The first isolate per patient per year that underwent susceptibility testing for C/T, CZA, and colistin were included in the study. All isolates underwent in-house susceptibility testing for 9 anti-pseudomonal agents according to the methodology established by the Clinical Laboratory Standards Institute (CLSI). Susceptibility testing of C/T, CZA, and colistin were performed by a reference lab. Isolates were classified into 3 drug-resistant