Conclusion. Study findings highlight the complexity of the injection drug use process and the potential social and physiological pathways leading to SBI. Multiple domains at the structural, network, and individual level that impact drug injection practices and provide context by which these factors predispose and lead to physiological tissue damage and the development of SBI among PWID.

Disclosures. Benjamin Eckhardt, MD, MS, Gilead Sciences (Grant/Research Support)

1216. Presence of the Narrow-Spectrum OXA-1 Beta-lactamase Enzyme Is Associated with Elevated Pipercillin-Tazobactam MIC Values Among ESBL-producing Enterobacteriaceae Clinical Isolates (CANWARD, 2007-2018)

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Session: P-72. Resistance Mechanisms

Background. The clinical outcome of patients with bacteremia due to an extended-spectrum beta-lactamase (ESBL)-producing member of the family Enterobacteriaceae who are treated with piperacillin-tazobactam appears to depend at least in part, on the piperacillin-tazobactam MIC. The purpose of this study was to determine whether there is any association between the MIC of piperacillin-tazobactam and presence of the narrow spectrum OXA-1 beta-lactamase enzyme among ESBL-producing Enterobacteriaceae.

Methods. E. coli clinical isolates were obtained from patients evaluated at hospitals across Canada (January 2007 to December 2018) as part of an ongoing national surveillance study (CANWARD). ESBL production was confirmed using the Clinical and Laboratory Standards Institute phenotypic method. Susceptibility testing was carried out using custom broth microdilution panels, and all isolates underwent whole genome sequencing for beta-lactam resistance detection.

Results. In total, 671 ESBL-producing E. coli were identified as part of the CANWARD study. The majority of isolates (92.0%; 617/671) harbored a CTX-M ESBL enzyme. CTX-M-15 (62.3%; 416/671), CTX-M-2 (13.9%; 93/671), and CTX-M-14 (13.1%; 90/671) were the most common variants identified. The narrow spectrum OXA-1 beta-lactamase enzyme was present in 42.6% (286/671) of isolates. OXA-1 was detected in 66.3% (277/418) of isolates with a CTX-M-15 ESBL enzyme versus only 3.6% (9/253) of isolates with other ESBL enzyme types. The piperacillin-tazobactam MICs of the OXA-1 enzymes varied from 4 μg/mL and 32 μg/mL for isolates that possessed the OXA-1 enzyme versus 2 μg/mL and 8 μg/mL for those that did not. The percentage of ESBL-producing E. coli isolates that were inhibited by a piperacillin-tazobactam MIC of ≤8 μg/mL was 68.5% for isolates that were OXA-1 positive and 93.8% for isolates that were OXA-1 negative.

Conclusion. The MIC<sub>50</sub> and MIC<sub>90</sub> values of piperacillin-tazobactam among ESBL-producing E. coli were higher for the subset of isolates that harbored a narrow spectrum OXA-1 beta-lactamase enzyme relative to the subset that did not. This association was primarily observed among ESBL-producers with the CTX-M-15 enzyme variant. OXA-1 was infrequently detected among isolates with other ESBL enzyme types.

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1217. Molecular Epidemiology of Pseudomonas aeruginosa in Latin America: Clinical Isolates From Respiratory Tract Infection

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Session: P-72. Resistance Mechanisms

Background. Respiratory Tract Infection (RTI) caused by P. aeruginosa is a common infection among hospitalized patients, with increased levels of morbidity and mortality. This pathogen exhibits multiple resistance mechanisms to antibiotics. We analyzed the molecular epidemiology and activity of the main therapeutic options against P. aeruginosa isolated from RTI in Latin America (LATAM).

Methods. Isolates were collected from 36 sites in 10 countries during 2017-2019. Non-duplicate samples were consecutively collected. MICs were determined by broth microdilution and interpreted by CLSI criteria. A subset of imipenem non-susceptible isolates was selected for characterization of carbapenemase encoding genes via multiplex PCR and DNA sequencing, β-lactamase genes encoding ESBLs, carbapenemases, and plasmid-mediated AmpC genes were investigated.

Results. A total of 2,044 P. aeruginosa were collected from RTI. Overall C/T (87.8% susceptible) (S) was the most active antimicrobial tested against P. aeruginosa isolates followed by amikacin (85.8% S) and imipenem/relebatam (IMI/REL) 85.2%
Other antimicrobials had less than 80% susceptibility. C/T remained the most active agent including activity against imipenem and piperacillin/tazobactam non-susceptible isolates (Figure 1). 583 imipenem non-susceptible *P. aeruginosa* were selected for molecular analysis (Table 1). Thirty (5.1%) isolates were confirmed to be producers of serine-carbapenemases (GES-5 (6 isolates); KPC-2 (24 isolates)), while 83 (14.2%) were MBL producers. KPC-2 was found in Colombia (9), Chile (6), Puerto Rico (4), Guatemala (3), and Brazil (2). GES-5 was identified in Mexico (3), Argentina (2) and Brazil (1). VIM-2 was the most common MBL encoding gene identified. IMP variants were observed in Brazil (IMP-56, IMP-1), Ecuador (IMP-13), Mexico (IMP-18), Panama (IMP-18) and Puerto Rico (IMP-18). SPM-1 was only encountered in Brazil. The production of ESBLs was low in most LATAM countries, except for Guatemala (80%) (Figure 2).

**Figure 1.** Activities of selected antimicrobial agents against 2,044 *P. aeruginosa* isolated from respiratory tract infections in Latin America (2017 to 2019).

**Table 1.** Molecular analysis of imipenem non-susceptible *P. aeruginosa* isolates in Latin America (LATAM) from Respiratory Tract Infection (N=583).

![Table 1](image)

**Figure 2.** Carbapenemases identified in 583 imipenem non-susceptible *P. aeruginosa* isolated from patients with respiratory tract Infections in Latin America (LATAM).

**Conclusion.** CT, amikacin and IMI/REL showed good activity against RTI isolates and could represent effective treatment options for *P. aeruginosa* infections. The prevalence of carbapenemases-encoding genes varied geographically in LATAM.

**Disclosures.** Leandro Cardinal, PharmD, PhD, MSD (Employee) Cicera P. Marcelino, n/a, MSD (Employee) Aline Okuma, n/a, MSD (Employee) MSD Brazil (Employee) Gustavo Mizuno, PharmD, Merck Sharp Dohme (Employee) Felipe Tuon, PhD, Merck Sharp Dohme Brazil (Scientific Research Study Investigator) Ana C. Gales, MD, MSD (Board Member, Advisor or Review Panel member, Speaker's Bureau) Pfizer (Board Member, Consultant, Advisor or Review Panel member, Speaker's Bureau) Marina Della Negra, Medical Doctor, MSD Brazil (Employee) Thales Polis, Medical Doctor, MSD Brazil (Employee)

**Methods.** A total of 27,968 Enterobacteriaceae isolates collected in US hospitals from 2014 to 2019 were susceptibility tested by reference broth microdilution methods. Results were interpreted using CLSI 2020 breakpoints. CRE isolates were submitted to PCR/sequencing (2014-2015) or whole genome sequencing (WGS; 2016-2019) for characterization of carbapenemase genes. Isolates from 2016-2019 were evaluated for other non-lactam resistance genes. The production of ESBLs was low in most LATAM countries, except for Guatemala (80%) (Figure 2).

**Results.** Among 357 (1.3% of all isolates) CRE isolates identified during 6 years of surveillance, 48 (13.4% of the CRE) isolates did not produce known carbapenemases. The CN-CRE collection included 7 bacterial, species, or species complex. The top four most common species in the collection were *P. aeruginosa* (16 isolates) followed by *E. cloacae* (9), *E. coli* (8), and *K. aerogenes* (8). MVB was the most active agent tested against these isolates, inhibiting 47/48 (97.9%) of the isolates tested. The only isolate displaying a resistant MIC for MVB was a *P. mirabilis* (MIC, 16 mg/L) collected in Brazil alone. Over 80% of the isolates from LATAM exhibited reduced susceptibility to WGS, 15 harbored CTX-M encoding genes. *K. aerogenes* and *E. cloacae* isolates (3 each) overexpressed AmpC. OmpF/K36 was disrupted in 20 isolates and OmpF/K35 was disrupted in 8 isolates.

**Conclusion.** MVB displayed good activity against CN-CRE isolates from US hospitals. This combination agent could be a good option to treat infections caused by these isolates.

**Disclosures.** Mariana Castanheira, PhD, AbbVie (formerly Allergan) (Research Grant or Support) Cipla USA Inc. (Research Grant or Support) Pfizer (Research Grant or Support) Spero Therapeutics (Research Grant or Support) GlaxoSmithKline (Research Grant or Support) Melinta Therapeutics, Inc. (Research Grant or Support) Melinta Therapeutics, LLC (Research Grant or Support) Cidara Therapeutics, Inc. (Research Grant or Support) Shionogi (Research Grant or Support) Pfizer (Research Grant or Support) Opexa Biopharma (Research Grant or Support) Spero Therapeutics (Research Grant or Support) Cidara Therapeutics (Research Grant or Support) Pfizer (Research Grant or Support) Pfizer (Research Grant or Support) Pfizer (Research Grant or Support) Pfizer (Research Grant or Support) Pfizer (Research Grant or Support) Cidara Therapeutics, Inc. (Research Grant or Support)

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