Antimicrobial Susceptibility of Pseudomonas aeruginosa to Ceftazidime-Avibactam, Ceftolozane-Tazobactam, and Meropenem Stratified by United States Census Divisions: Results from the 2017 INFORM Program

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INTRODUCTION

Pseudomonas aeruginosa is a major cause of nosocomial infection worldwide. As a result of the emergence of carbapenem-resistant isolates, 

* Antimicrobial susceptibility testing
  * Resistance mechanisms against carbapenem-resistant isolates include production of enzymes of specific classes, alteration of efflux pumps, and loss of porin OprD.
  * Resistance may result in clinical isolates with reduced susceptibility to carbapenems, including MDR and XDR isolates.

MATERIALS AND METHODS

Organism collection

- 1,909 P. aeruginosa isolates (254 per episode) were consecutively collected from 70 US medical centers (240 isolates from each census division) in 2017, as part of the International Network for Optimal Resistance Management (INFORM) program.
- Isolates were included in the study if they were isolated from clinical specimens collected within 14 days of hospital admission and were identified to the species level.
- Isolates that grew aerobically and were susceptible to colistin were included in the study, and the results were stratified by US census division.

Antimicrobial susceptibility testing

- Isolates were tested for susceptibility using the broth microdilution method as described in the CLSI M07Ed11E document.
- Carbapenem-resistant and carbapenem-susceptible isolates were included in the study.

RESULTS

- Carbapenem-resistant isolates (MIC ≥8 μg/mL) and carbapenem-susceptible isolates (MIC <8 μg/mL) were the most frequently isolated P. aeruginosa strains in the study.
- Carbapenem-resistant isolates were more resistant to colistin than carbapenem-susceptible isolates (Table 1).

CONCLUSIONS

- Carbapenem-resistant and carbapenem-susceptible isolates demonstrated potent activity against P. aeruginosa.
- Resistance may result in clinical isolates with reduced susceptibility to carbapenems, including MDR and XDR isolates.

ACKNOWLEDGEMENTS

This study was supported by Allergan. Allergan was involved in the design and decision to present these results, and the interviewer was involved in the preparation of the poster. All authors contributed to the collection, analysis, interpretation of data.

REFERENCES


Table 1 Antimicrobial susceptibility of 1,909 Pseudomonas aeruginosa clinical isolates from US medical centers (INFORM program, 2017)

| Antimicrobial agent | US Medical Center | Colistin | Amikacin | Gentamicin | Ciprofloxacin | Ceftazidime | Meropenem | P. aeruginosa isolate:
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Table 2 Antimicrobial susceptibility of 1,909 Pseudomonas aeruginosa clinical isolates stratified by US census division (INFORM program, 2017)

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Figure 1 Frequency of multidrug-resistant (MDR) and extensively drug-resistant (XDR) P. aeruginosa clinical isolates stratified by US census division

Figure 2 Antimicrobial susceptibility of multidrug-resistant (MDR) and extensively drug-resistant (XDR) P. aeruginosa clinical isolates stratified by US census division