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656. Comparative Activity of Newer β-Lactam/β-Lactamase Inhibitor Combinations against Pseudomonas aeruginosa isolates from United States Medical Centers (2020-2021)

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Background. P. aeruginosa (PSA) is one of the most common Gram-negative organisms causing infections in hospitalized patients. Prompt administration of an effective antimicrobial is crucial for patients with systemic PSA infection. We evaluated the in vitro activity of ceftazidime-avibactam (CAZ-AVI), ceftolozane-tazobactam (C-T), meropenem-vaborbactam (MEM-VAB), imipenem-relebactam...
Methods. 3,184 isolates were consecutively collected from 71 US medical centers in 2020-2021 and susceptibility tested by reference broth microdilution methods in a monitoring laboratory (JMI Laboratories). US FDA and CLSI breakpoints were applied.

Results. CAZ-AVI (97.0% susceptible [S]), C-T (98.0%S), IMI-REL (97.3%S), and tobramycin (TOB; 96.4%S) were the most active agents against the aggregate PSA isolate collection and retained good activity against piperacillin-tazobactam (PIP-TAZ) nonsusceptible (NS), MEM-NS, and multidrug-resistant (MDR) isolates (Table 1). All other antimicrobials tested showed limited activity against PIP-TAZ-NS, MEM-NS, and MDR isolates. The most common infection types were pneumonia (45.9%), skin and skin structure infections (19.0%), urinary tract infections (UTI; 17.0%), and bloodstream infections (11.7%); CAZ-AVI, C-T, and IMI-REL showed consistent activity against isolates from these infection types. Susceptibility to PIP-TAZ and MEM were lower among isolates from pneumonia compared to other infection types (Table 2). CAZ-AVI remained active against 31.7% and 52.5% of C-T-NS and IMI-REL-NS isolates, respectively. C-T remained active against 54.7% and 68.9% of CAZ-AVI-NS and IMI-REL-NS isolates, respectively, and IMI-REL remained active against 64.2% and 64.8% of isolates NS to CAZ-AVI and C-T, respectively.

Conclusion. CAZ-AVI, C-T, and IMI-REL were highly active and exhibited similar coverage against a large contemporary collection of PSA isolates from US hospitals. Cross resistance among these new β-lactamase inhibitor combinations varied markedly, indicating that all 3 should be tested in the clinical laboratory. These 3 agents represent valuable therapeutic options for PSA infection treatment.

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