Factors influencing meropenem prescription following the 2020 EUCAST « I » definition update: a multicentric observational study in Belgian hospitals

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Acknowledgement of the research groups, study groups, or consortia if applicable
EUDIPA Study Group, Belgian National Antibiogram Committee

Background

In 2020, the European Committee on Antimicrobial Susceptibility Testing (EUCAST) redefined the "I" category in antimicrobial susceptibility testing (AST) to "susceptible, increased exposure," aiming to enhance antibiotic therapy by encouraging the use of targeted, narrow-spectrum antibiotics at higher doses instead of broader-spectrum antibiotics at standard doses. By July 2022, Belgian laboratories were encouraged to adopt these changes, categorizing most antipseudomonal drugs as "I" while retaining meropenem as "S." This study assessed the impact of this redefinition on antibiotic selection for *Pseudomonas aeruginosa* infections in Belgian hospitals and identified factors associated with meropenem prescriptions.

Methods

Between November 2023 and July 2024, a multicentric retrospective observational study was conducted across Belgian hospitals. Data were collected via a Redcap tool, including hospitalized adults treated for wild-type *P. aeruginosa* monobacterial infections during a six-month period pre- and post-implementation of the new EUCAST definitions. Data included hospital-level factors (characteristics, AST reporting strategies, campaigns) and patient-level factors (epidemiological, microbiological, clinical, and therapy details). The primary outcome was the proportion of meropenem prescriptions post-susceptibility testing. Multilevel logistic regression identified factors associated with meropenem prescription.

Results

Among 1,705 patients (850 pre- and 855 post-implementation) from 37 acute care hospitals (35.9% national participation), meropenem prescriptions increased significantly post-EUCAST update, from 4.6% (39/850) to 7.1% (61/855, $p=0.027$), affecting 48.6% (18/37) of hospitals. Six factors were independently linked to meropenem use. Post-implementation patients had nearly double the odds of receiving meropenem (OR=1.93, 95%CI 1.19–3.12). Sharing written information exclusively post-shift significantly increased likelihood (OR=9.43, 95%CI 1.69–52.70). Other factors included sepsis (OR=2.00, 95%CI 1.11–3.59), ESBL history (OR=2.84, 95%CI 1.07–7.54), and allergies to key antibiotics (OR=4.28, 95%CI 2.12–8.62). Selective AST reporting reduced likelihood of meropenem prescriptions (OR=0.14, 95%CI 0.06–0.35).

Conclusions

The 2020 EUCAST criteria increased meropenem use for *P. aeruginosa* monobacterial infections in Belgium. While severe infections and allergies to first-line antipseudomonals partly explain this increase, the findings emphasize selective AST reporting's role in reducing use and the need for prescriber education before major practice changes. Targeted stewardship programs can promote appropriate antimicrobial use.