Activity of Ceftolozane-Tazobactam and Comparators When Tested against Bacterial Surveillance Isolates Collected from Pediatric Patients in the US during 2012–2016 as Part of a Global Surveillance Program

INTRODUCTION

• Ceftolozane-tazobactam (C-T) is an antibacterial combination of a novel antipseudomonal cephalosporin and a well-established β-lactamase inhibitor.
• C-T was approved by the US Food and Drug Administration in 2014 and by the European Medicine Agency in 2015 to treat complicated urinary tract infections, including acute pyelonephritis, and complicated intra-abdominal infections in adults.
• Pediatric treatment trials are planned for urinary tract infections and complicated intra-abdominal infections.
• The Program to Assess Ceftolozane-Tazobactam Susceptibility (PATS) monitors C-T resistance to gram-negative (GN) isolates worldwide.

MATERIALS AND METHODS

• A total of 4,121 GN isolates were collected during 2012–2016 from pediatric patients.
• 1143 isolates were bloodstream infection (n=767) and bloodstream infection (n=767) (Table 1).

RESULTS

• The most common infection type caused by gram-negative bacteria in hospitalized pediatric patients was pneumonia (41%). Following were urinary tract infections (11%) and bloodstream infections (8%).
• A total of 1,246 ENT and 1,628 non-ENT isolates were analyzed.
• The 5 most common species were Escherichia coli (n=1,781), Pseudomonas aeruginosa (n=536), Citrobacter freundii (n=265), Enterobacter species complex (n=264), and Citrobacter diversus (n=246). (Figure 1)
• MIC distributions of C-T for the most common enteric species are shown in Figure 2.
• MIC distributions of C-T, CAZ-NS, and TZP when tested against PSA are shown in Figure 3.

CONCLUSIONS

• C-T demonstrated excellent activity against positive ENT isolates (K. pneumoniae, EC, and PS-A) and against other cephalosporin-resistant Enterobacteriaceae (ESBL, non-CRE, ESBL-like extended-spectrum beta-lactamase screen positive (ESBL, non-CRE), and cepha-lactamase-non-susceptible (CNL, NCNS) and cepha-lactamase-susceptible (CLS)).
• Against NS, C-T was the most active agent tested (99.5%) and was similar to COL (99.3%) and COLb (99.2%). Against other beta-lactams, including isolates nonsusceptible to all other beta-lactams tested (BL-NSe), C-T had excellent activity (83%)
• For EC with the ESBL non-CRE phenotype, C-T had excellent activity (95.2%), followed by Piperacillin-tazobactam (96.9%) and Meropenem (99.7%). Against ESBL non-CRE, C-T had excellent activity (91.0%), followed by Piperacillin-tazobactam (99.2%), and Meropenem (99.8%). Against ESBL-CRE, C-T had excellent activity (93.8%), followed by Meropenem (96.9%) and Piperacillin-tazobactam (94.0%). Against non-CRE extended-spectrum beta-lactamase (CRE), non-CRE extended-spectrum beta-lactamase (NCS), and cepha-lactamase-susceptible (NCS), C-T had excellent activity (95.3%), followed by Meropenem (96.9%) and Piperacillin-tazobactam (96.9%). Against Piperacillin-tazobactam, C-T maintained very good activity (83.9%) against 12 isolates resistant to all other beta-lactams tested in this study.
• The results of this study suggest that C-T may be a valuable treatment for serious infections in pediatric patients.
• Pediatric treatment trials for complicated intra-abdominal infection and complicated urinary tract infection, including pyelonephritis, are planned.