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2021. Treatment of Carbapenem-Resistant Enterobacteriaceae (CRE) in 6 US communities

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Background. Antibiotic resistance profiles of CRE infections pose a substantial treatment challenge. We described the antibiotics being used to treat CRE infections and assessed effective antibiotic use.

Methods. CDC's Emerging Infections Program performs active population-based laboratory surveillance for CRE. CRE cases are defined by isolation, from urine or a normally-sterile site, of *Escherichia coli*, *Klebsiella* spp., or *Enterobacter* spp. non-susceptible to carbapenems (except ertapenem) and resistant to all third-generation cephalosporins tested. Six EIP sites piloted an assessment of antibiotic therapy for 3 months in 2014 to evaluate treatment in the 14 days after specimen collection. Antibiotic class, timing of antibiotic relative to specimen collection date, and effective antibiotic use (based on susceptibility documented in the medical record) were evaluated.

Results. Of the 105 incident cases, 11 (10%) were invasive infections and 94 (90%) had positive urinary cultures alone. *Klebsiella pneumoniae* was the most common organism (59%). Most patients (80%) received an antibiotic within 14 days after specimen collection, most commonly fluoroquinolones (21%). Of the 71 patients assessed for effective antibiotic use, 48 (68%) received an effective antibiotic within 14 days of specimen collection, most commonly aminoglycosides (26%). Median time to any antibiotic was 0 days (range: 0–11 days), whereas median time to first effective antibiotic was 3 days (range: 0–12 days). Effective therapy was similar in invasive infections (75%) and urinary isolates (66%). 19 patients (42%) received an effective antibiotic as initial therapy, most commonly fluoroquinolones. 26 patients (58%) received their effective antibiotic after sensitivities became available, most commonly aminoglycosides.

Conclusion. Nearly a third of patients with CRE who received antibiotics did not receive an effective antibiotic within 14 days of their specimen collection date. Although most patients received an antibiotic on the date of specimen collection, the median time to first effective antibiotic was 3 days after specimen collection. For patients with CRE infections, rapid susceptibility testing may help guide prompt, effective treatment.

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