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P1808 Estimating the treatment of carbapenem-resistant *Enterobacteriaceae* infections in the United States using antibiotic prescription data

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Background: Polymyxins (colistin, polymyxin B) have been frontline antibiotics against carbapenem resistant Enterobacteriaceae (CRE) infections. CRE-active agents ceftazidime-avibactam (C-A) and meropenem-vaborbactam (M-V) have been approved by the United States (US) Food and Drug Administration since 2015. Our objectives were to describe polymyxin, C-A, and M-V use in the US, and estimate percentages of CRE infections treated with these agents.

Materials/methods: We obtained US antibiotic prescription data (IQVIA, Durham, NC) since 2013, and used standard dosing regimens to estimate numbers of infections treated with different agents. Prior to 2015, polymixin use was assumed to be 50%/50% against CRE and other infections, respectively, based on US estimates and data from our center. Since 2015, we assumed that C-A and M-V were prescribed exclusively against CRE infections. Number of CRE infections during this time period was calculated as: ((infections treated by polymixins, C-A, or M-V) x 0.5).

Results: The use of C-A and M-V almost perfectly offsets the overall decline in colistin use since March 2015 (~8,000 total infections annually). Annual polymyxin B prescriptions were not significantly changed over the study period. At present, estimated numbers of CRE infections treated by particular agents annually are colistin, 10,600; polymyxin B, 8,000; C-A, 7,300; M-V, 1,400. Taken together, colistin and polymyxin B are currently estimated to treat 18,600 CRE infections per year, compared to an estimated 8,700 infections treated by C-A and M-V (68% and 32% of total, respectively). C-A and M-V use has increased at a consistent incremental rate since 2016.

Conclusions: Polymyxins remain widely used to treat CRE infections in the US, despite clinical failure and nephrotoxicity rates of ~40%-60% and ~20%-40%, respectively. Although mounting evidence demonstrates that C-A and M-V improve outcomes and reduce toxicity among CRE-infected patients compared to colistin and other therapies, the newer agents have been slowly incorporated into clinical practice. The data raise serious questions about antimicrobial stewardship practices, types of data necessary to spur use of effective agents, antibiotic pricing, and the economic sustainability of antibiotic development.