

Clinical Outcomes for Patients Treated with Fluoroquinolones for Bacteremia Caused by Enterobacteriaceae Reclassified as Not Susceptible by Updated CLSI Breakpoints

Zachary Fleischner MD¹, Wendy Szymczak PhD², Gregory Weston MD MS¹

¹ Division of Infectious Disease, ² Department of Pathology; Montefiore Medical Center/Albert Einstein College of Medicine, Bronx, NY

Background

Antibiotic resistance remains a pressing public health challenge. Antibiotic susceptibility testing is crucial to identify resistance and predict which antibiotics are most likely to be effective. In vitro minimum inhibitory concentrations (MICs) are interpreted using MIC breakpoints set for the United States by The Clinical and Laboratory Standards Institute (CLSI). In 2019 CLSI updated fluoroquinolone (FQ) breakpoints for Enterobacteriaceae. Previously any isolate with an MIC ≤ 1 $\mu\text{g/mL}$ of ciprofloxacin would be considered susceptible but based largely on pharmacokinetic-pharmacodynamic simulations the susceptibility breakpoint was revised to ≤ 0.25 $\mu\text{g/mL}$. However, the clinical relevance of this decision remains unclear.

Methods

All cases of Enterobacteriaceae bacteremia with isolates previously considered susceptible but reclassified as resistant (MIC = 1 $\mu\text{g/mL}$) in adults treated with FQs between 08/01/2018 and 07/31/2019 were identified. Demographics, clinical characteristics and outcomes were compared with an equal number of randomly selected isolates with an automated MIC reported as ≤ 0.5 $\mu\text{g/mL}$. Available stored isolates with a reported MIC of ≤ 0.5 $\mu\text{g/mL}$ had manual E-testing performed to identify a more precise MIC.

Results

29 cases with an MIC = 1 $\mu\text{g/mL}$ were compared with 29 controls with a MIC of ≤ 0.5 . Only 3 cases and 1 control received FQs as empiric therapy, the remaining patients in each group were transitioned to FQ after a median of 4 days of other antibiotics. No significant difference was found for predetermined outcomes including 30 day mortality, escalation after starting FQ, length of hospital stay, and readmission in 30 days (see Table). No primary outcome was thought to be related to antibiotic failure. E-testing found no isolates with an MIC = 0.5 $\mu\text{g/mL}$.

Conclusions

Patients with Enterobacteriaceae bacteremia treated with FQs for isolates reclassified as resistant had similar outcomes to those with lower MICs. While FQs are generally not recommended as first line empiric antibiotics, FQs may still be safe to use as stepdown therapy for isolates with a ciprofloxacin MIC = 1 $\mu\text{g/mL}$, particularly if the only alternative may be IV antibiotics. A larger study is needed to confirm this.

References

Chantell et al. Fluoroquinolone Breakpoints for Enterobacteriaceae and Pseudomonas aeruginosa: CLSI rationale document MR02. February 2019. <https://clsi.org/media/3011/mr02ed1.pdf>

Correspondence

Zachary.Fleischner@wmchealth.org

	MIC = 1 (n = 29)	MIC ≤ 0.5 (n= 29)
30 day mortality	0	1 (3.4%)
Non-sterilization (w/FQ)	0	0
Escalation after starting FQ	1	0
LOS	6.5 days	6.2 days
Readmission (30d)	6 (21%)	7 (24%)