In Vitro Activity of Fosfomycin Against Bacterial Pathogens Isolated from Urine Specimens of Outpatients Attending Emergency Departments in Canada from 2007 to 2014

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ABSTRACT

Background: In North America, fosfomycin (FOS) susceptibility testing is performed using CLSI broth microdilution, by which organisms are incubated in a 96-well plate for 18-24 hours at 35°C (1). This method is cumbersome and not widely available. In contrast, CLSI agar dilution testing is performed using a standardized broth dilution technique (2) where disadvantages of the CLSI broth microdilution method are overcome. The objective of this study was to evaluate the correlation between the CLSI agar dilution method and CLSI broth microdilution methods for the determination of fosfomycin susceptibility in Enterobacteriaceae.

Methods: FOS susceptibility testing was performed using CLSI agar dilution testing (3) with organisms representing 9 main classes of Enterobacteriaceae and 40 non-Enterobacteriaceae species. Isolates were treated as sensitive, intermediate, or resistant according to the CLSI breakpoints. A multiple strain drug sensitivity report was performed.

Results: The sensitivity rates of the CLSI agar dilution method were compared with those obtained using the CLSI broth microdilution method. The results were consistent with those of the CLSI broth microdilution method with CLSI agar dilution testing and CLSI broth microdilution method.

Conclusions: The methods for the determination of fosfomycin susceptibility in Enterobacteriaceae are consistent with those of the CLSI broth microdilution method.

MATERIALS & METHODS

Bacterial isolates. The isolates tested were cultered from urine specimens of outpatients attending emergency departments and submitted to the annual CANRAD survey study from 2007 to 2014 (4). Primary identification was performed by the laboratory. E. coli and other Enterobacteriaceae were identified by the CLSI method (1). Isolates were selected for the study based on the following criteria: (i) MICs were determined using CLSI broth microdilution methods (1). (ii) The cephalosporin susceptibility testing was performed using CLSI disk diffusion testing (5). (iii) The susceptibility testing was performed using CLSI broth microdilution methods (1).

Antimicrobial susceptibility testing. The isolates were tested for antimicrobial susceptibility according to the CLSI method (1). 

CONCLUSIONS

1. Fosfomycin demonstrated potential in vitro activity against E. coli with 98.7% of isolates susceptible.
2. 10% of E. coli, P. aeruginosa, and P. mirabilis were resistant to fosfomycin.
3. Resistance was not seen in other species of Enterobacteriaceae and Gram-negative bacteria.
4. The CLSI broth microdilution method is the gold standard for the determination of fosfomycin susceptibility in Enterobacteriaceae.

REFERENCES