AMENDED ABSTRACT

The polymyxins are polypeptides that have activity against a wide variety of Gram-negative bacteria, including Enterobacteriaceae, Staphylococcus aureus, and Pseudomonas aeruginosa. The emergence of multidrug-resistant (MDR) and highly MDR strains has made the polymyxins an increasingly important class of antimicrobial agents for the treatment of infections resistant to other classes of antibiotics. This study evaluated the use of Polysorbate 80 (P-80) as an alternative to standard broth microdilution tests for the determination of minimal inhibitory concentrations (MICs) of polymyxins.

A total of 202 Enterobacteriaceae isolates were classified as colistin-resistant (MIC >8 µg/ml) and divided into four groups based on their susceptibility to polymyxins: Group 1 (MIC <2 µg/ml), Group 2 (MIC >2 µg/ml but ≤4 µg/ml), Group 3 (MIC >4 µg/ml but ≤8 µg/ml), and Group 4 (MIC >8 µg/ml).

The results indicated that P-80 decreased MIC values for all organism groups tested. For colistin, 26.7% of the initial numbers of isolates displayed 90.0% acceptable variation (EA) among all MIC50/90.

The polymyxins, particularly colistin, demonstrated good correlation for all organisms tested against reference methods and other modifications. Results were published in CLSI documents.

RESULTS

Background:

Susceptibility (S) testing of polymyxins is challenging and the differentiation of resistant and sensitive isolates is difficult to read due to skipping and lack of consistent endpoints. This is a major issue, particularly in non-fermentative isolates, where numerous false negative results were reported.

Materials and methods:

Colonies were transferred to the SENTRY Antimicrobial Susceptibility Program (2012) or to the following bacterial species: A. baumannii (ATCC 19606), C. neutrositis (ATCC 35210), K. pneumoniae (2009), and P. aeruginosa (3386). Bacterial isolates were tested using CLSI reference methods using dry-form (DF) panels and broth microdilution MIC values were determined. The MIC values for all isolates were re-tested in frozen-form (FF) panels against Co±P-80 and results were compared with results obtained using frozen-form and/or dry-form methods. Additionally, colistin and polymyxin B showed very good correlation for all organisms tested.

Conclusions:

The polymyxins, particularly colistin, demonstrated good correlation for all organisms tested against reference methods and other modifications. Results were published in CLSI documents.

REFERENCES