

TITLE: PERFORMANCE OF RAPID COLORIMETRIC METHODS FOR DETECTION OF POLYMYXIN RESISTANCE IN CARBAPENEM-RESISTANT ENTEROBACTERIALES

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ABSTRACT:

Polymyxins are considered as the last resort antimicrobials for treating infections due to the multidrug-resistant gram-negative bacilli (GNB). Susceptibility testing is challenging for the routine of clinical laboratories due to the lack of more accessible and accurate tests to perform, such as disk diffusion and Etest strips, since the reference method (broth dilution) is more laborious. This work aimed to evaluate two colorimetric methods [Andrade Screening Antimicrobial Test (ASAT) and rapid polymyxin-NP (POLI-NP)] for screening the resistance to polymyxins in *Enterobacteriales*, comparing them to broth dilution. We made some buffer preparation modifications and used colistin/polymyxin B disk elution (ASAT-M and POLI-NP-MOD). We tested 149 isolates of *Enterobacteriales*. Kappa coefficient revealed a categorical agreement of 0.77 for colistin, 0.80 for polymyxin B ASAT-M, and 0.89 for colistin/polymyxin B POLI-NP-MOD. ASAT-M and POLI-NP-MOD showed high VME (ASAT-M: 25% for colistin, 19.23% for polymyxin B; POLI-NP-MOD: 13% for both). ASAT-M demonstrated ME of 2.06% for colistin and 3.09% for polymyxin B, while POLI-NP-MOD did not show ME. When analyzed by bacterial species, a kappa coefficient of 0.90 was observed for *Enterobacter* spp. in colistin/polymyxin B POLI-NP-MOD and 0.68 ASAT-M with colistin. Tests proved to be easy and inexpensive to prepare, providing a response within a few hours and reducing the time needed to detect polymyxin-resistant isolates from 20 to 4 hours. Although inappropriate VME values were obtained, POLI-NP-MOD showed better results for screening polymyxin-resistant *Enterobacteriales* isolates. However, if the test result shows polymyxin-susceptible isolates, confirmation by the reference method is required.

Keywords: Polymyxin B; Colistin; POLI-NP; Andrade Screening Antimicrobial Test; Disk-elution method.

Development Agency: None.