

TITLE: USE OF ENZYME INHIBITORS IN BLUE-CARBA TEST FOR DETECTION OF METALLO-BETA-LACTAMASES

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ABSTRACT:

Low-cost phenotypic methods for detecting carbapenemases, which are easy to perform and fast in response time, are essential in the routine of microbiology laboratories in hospitals. In this work, the BLUE-CARBA test was evaluated with the addition of the enzyme inhibitors disodium ethylenediaminetetraacetic acid (EDTA) and dipicolinic acid (DPA) to detect metallo- β -lactamase (M β L) producing isolates. In total, 150 carbapenem-resistant isolates, molecularly characterized by their resistance mechanisms, were tested. *Enterobacteriales* and gram-negative non-glucose fermenting bacilli were included, 71 M β L producing isolates (*bla*_{NDM}, *bla*_{IMP-1}, *bla*_{VIM}, *bla*_{SPM}, *bla*_{KPC} + *bla*_{NDM}, and *bla*_{VIM} + *bla*_{KPC}), 63 serine-carbapenemase producing isolates (*bla*_{KPC}, *bla*_{GES-5}, *bla*_{GES-16}, *bla*_{OXA-23}, *bla*_{OXA-48}, *bla*_{OXA-58}, and *bla*_{OXA-143}), and 16 non-carbapenemase producing isolates. The results showed 100% sensitivity and specificity for DPA and EDTA for discriminating carbapenemases classes A and B. Also, tests had 100% specificity for non-producers of carbapenemases. The limitations occurred in the class D carbapenemases and co-producers; the tests could not detect these isolates. Recently, determining carbapenemase classes became fundamental in the laboratory routine, especially due to the new antimicrobials, β -lactam/ β -lactamase inhibitor combination, such as ceftazidime-avibactam, which has no activity against M β L-producing isolates.

Keywords: M β L; Colorimetric method; EDTA; Dipicolinic acid; NDM, IMP, VIM

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