

TITLE: DETECTION OF CARBAPENEMASE PRODUCING IN MDR ENTEROBACTERIACEAE ISOLATES USING PHENOTYPIC TESTS mCIM AND eCIM AT A TERTIARY HOSPITAL IN THE CITY OF SALVADOR - BAHIA.

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ABSTRACT:

Infections caused by carbapenem resistant enterobacteriaceae represent a major challenge in global public health, especially due to high mortality rates, increased hospitalization time, costs in health units and limited therapeutic options. Among the main mechanisms of resistance to carbapenems in enterobacteriaceae, stands out the production of beta-lactamases, that can hydrolyze this class of antibiotics. The detection of these enzymes in the microbiology laboratory is essential for introducing on early and assertive therapy, especially for the use of new drugs available. Therefore, new phenotypic tests, such as *carbapenem inactivation method* (mCIM) and *EDTA-modified carbapenem inactivation method* (eCIM) were developed for detection and differentiation between serine-beta-lactamase (group A) and metallo-beta-lactamase (group B), respectively. The aim of this study was to differentiate the groups of carbapenemase produced by isolates of MDR enterobacteriaceae through the mCIM and eCIM phenotypic tests. A total of 101 consecutive clinical isolates resistant to carbapenems, not repeated, from May 2018 to April 2019, were evaluated at a tertiary hospital in the city of Salvador, Bahia. The isolates were identified by MALDI-TOF (VITEK® MS, *bioMérieux*) and susceptibility tests (AST) by VITEK® 2 and Etest (*bioMerieux*). The AST, mCIM and eCIM were performed following the standardization of CLSI M100-S28. ATCC® strains were used for validation of the tests. From the total isolates analyzed (N = 101), 76 (75,2%) were positive only for mCIM (indicating serine production) and 25 (24.8%) were positive for mCIM and eCIM (indicating metallo production). Among the producers of carbapenemase, *K. pneumoniae* was the most prevalent (72,3%), followed by complex *E. cloacae* (12,9%), *E. coli* (5,0%), *K. aerogenes* (4,0%), *P. stuartii* (2,0%) and others species (4,0%). The use of these phenotypic tests is a good strategy for phenotypic detection of carbapenemase and differentiation between main groups (A and B). In addition, the implementation in laboratory routine is possible due to the low cost and easy of execution of these tests, being an alternative to molecular methods, contributing to a better targeting of the therapy of infections caused by MDR enterobacteriaceae.

Keywords: Bacterial resistance, Enterobacteriaceae, Carbapenemase, mCIM, eCIM.