TITLE: COMPARATIVE STUDY BETWEEN TESTS RESIST-3 O.K.N. K-SET (CORIS-BIOCONCEPT) AND (mCIM/eCIM) FOR DETECTION OF CARBAPENEMASES IN MDR *ENTEROBACTERIACEAE* IN A TERTIARY HOSPITAL OF THE CITY OF SALVADOR - BAHIA.

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ABSTRACT:

The detection, treatment and control of infections caused by Carbapenem-resistant *Enterobacteriaceae* (CRE) are a challenge, and it is necessary the developement tests capable of detecting and differentiating carbapenemases (serine-beta-lactamase and metallo-beta-lactamase) for treatment targeting by new antibiotics. Phenotypic methods (*modified carbapenem inactivation method* (mCIM) and EDTA-*modified carbapenem inactivation method* (eCIM)) and genotypic methods (PCR, sequencing) are used to investigate these enzymes. Currently, multiplex immunochromatographic rapid tests are able to detect simultaneous production of KPC (*K. pneumoniae* carbapenemase), OXA-48 (Oxacilinase) and NDM (New Delhi Metalo-carbapenemase). The aim of this study was to evaluate the performance of immunochromatographic test RESIST-3 O.K.N. K-SeT (CORIS-Bioconcept) for detection of carbapenemases (KPC, NDM and OXA-48) in CRE in comparasion to mCIM and eCIM phenotypic tests. Fifty-six isolates of CRE were evaluated from September 2018 to May 2019 at a tertiary hospital in Salvador-Bahia. The identification of isolates was performed by MALDI-TOF (VITEK® MS, *bioMérieux*) and Antimicrobial Susceptibility Tests (AST) by VITEK® 2 (*bioMerieux*) and confirmed by disk diffusion and E-test® (*bioMerieux*). The AST, mCIM and eCIM were performed following the standardization of CLSI M100-S28. The RESIST-3 O.K.N. was performed according to the manufacturer's recommendations. ATCC® strains were used to validate the methodologies. Of total isolates (N = 56), *K. pneumoniae* 44 (78.6%) was the most frequent, followed by complex *E. cloacae* 9 (16.1%) and *E. coli* 3 (5.3%). The RESIST-3 O.K.N. detected 32 (57.2%) KPC, 18 (32.1%) NDM and 5 (8.9%) negative isolates, 100% concordant with the phenotypic tests. The co-production of KPC and NDM enzymes was detected in one (1.8%) *K. pneumoniae* isolate, not observed in phenotypic tests. In one KPC isolate, without decreasing susceptibility to carbapenems in vitro or detection in phenotypic tests, the test RESIST-3 O.K.N was able to detect the enzyme. RESIST-3 O.K.N. has been shown to be effective for the detection and differentiation of KPC and NDM carbapenemases, as well as detection of enzyme co-production and production before in vitro expression in AST. Ease of use and rapidity make the test an important tool for rapid detection of carbapenemases, contributing to early and assertive treatment of CRE infections.

Keywords: Carbapenemases, KPC, NDM, OXA-48, mCIM, eCIM, RESIST-3 O.K.N