TÍTULO: EFFICIENCY ANALYSIS OF THE MODIFIED HODGE TEST THROUGH RESULTS WITH THE MOLECULAR GENE DETECTION TESTS *bla*KPC

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RESUMO:

Antimicrobial resistance is a major public health problem worldwide and involves several factors. KPC (*Klebsiella pneumoniae* carbapenemase) is a β-lactamase/carbapenemase enzyme, which confers resistance to several antimicrobials classes, including carbapenems, and is easily disseminated in the hospital environment, produced mainly by *Enterobacteriaceae* family. This carbapenemase is encoded by the *bla*KPC gene, located on a mobile plasmid, which facilitates its dissemination. The identification of KPC producing bacteria occurs through a series of biochemical tests, antimicrobial susceptibility profile verification and several phenotypic and molecular tests to verify resistance mechanisms. Phenotypic tests associated with the antimicrobial susceptibility profile may guide the patients therapy, and it is not necessary to identify the gene for this purpose. Modified Hodge Test (THM) is a phenotypic test used to detect the possible production of carbapenemases. Currently, it is stated that the sensitivity of this test is 100% and its specificity is 98%, and false positives may occur in 2% of study cases. This phenotypic test has the advantage of identify carbapenemase producers besides being easy to perform and available for laboratory routine. The objective of this study was to verify the efficacy of THM for the detection of KPC carbapenemases in *Enterobacteriaceae* and confirm through the results of Polymerase Chain Reaction (PCR), a molecular method considered golden pattern in the detection of genes responsible for the production of this enzyme. Results confirmed that the production of the KPC enzyme is not restricted to *Klebsiella pneumoniae* and can be synthesized by several

other *Enterobacteriaceae*. The efficacy of THM was confirmed, and the *bla*KPC gene could be detected by PCR in 99% of suspected THM positive strains and only 1% was found to be false positive, with positive THM and negative PCR. In this way, THM it is considered na effective and reliable method for the identification of KPC enzyme producing bacteria, and that it can be easily implemented in the laboratory routine due to its low cost and for being easy to execute.

Palavras-chave: *Klebsiella pneumoniae* carbapenemase, *Enterobacteriaceae*, β-lactamase, Multiresistance, Modified Hodge Test, *bla*KPC gene.