TITLE: OCCURRENCY AND MOLECULAR CARACTERIZATION OF MULTIDRUG-RESISTANT Klebsiella pneumoniae ISOLATES FROM HEALTHCARE-ACQUIRED INFECTIONS IN MACEIÓ-AL, BRAZIL

AUTHORS: MAGALHÃES, F. M.1,2; ALVES, M. M.1,2; DE FREITAS, C. F.2; OLIVEIRA-JÚNIOR, J.B.2; DE LIMA, F. C. G.2; FEITOSA, A. P. S.1,2; BRAYNER, F. A.2,3; VERAS, D. L.3; ALVES, L. C.1,3

INSTITUTION: 1 - LABORATÓRIO DE IMUNOPATOLOGIA KEIZO ASAMI - LIKA/UFPE (AV. PROF. MORAES REGO, 1235 - CIDADE UNIVERSITÁRIA, RECIFE - PE, 50670-901); 2 - UNIVERSIDADE FEDERAL DE PERNAMBUCO – UFPE (AV. PROF. MORAES REGO, 1235 - CIDADE UNIVERSITÁRIA, RECIFE - PE, 50670-901); 3 - INSTITUTO AGGEU MAGALHÃES - IAM/FIOCRUZ – PE (CAMPUS DA UFPE - AV. PROF. MORAES REGO, S/N - CIDADE UNIVERSITÁRIA, RECIFE - PE, 50670-420)

ABSTRACT: The incidence of carbapenem resistant isolates of Klebsiella pneumoniae is considered critical by the World Health Organization. Investigating the mechanisms of resistance in these isolates is important for taking appropriate measures and minimizing their consequences to healthcare system. The aim of this study was to determine the occurrence and genotypic profile of carbapenem resistance of multidrug-resistant isolates (MDR) K. pneumoniae from Healthcare-Acquired Infections (HAIs) in Maceió-AL. Isolates of K. pneumoniae, identified as MDR in the source laboratory using the diffusion disk method (CLSI, 2018), were obtained from two public (A and B) and one private (C) hospitals between May and December 2018. The species was confirmed by mass spectrometry (MALDI-TOF) and resistance to meropenem was determined by disc diffusion technique. The presence of genes was established by PCR with specific primers for the blaKPC, blaVIM and blaIMP genes, which confer resistance to carbapenems; and for the virulence genes: cpsP, responsible for the synthesis of capsular polysaccharide; and mrkD, which encodes type 3 fimbria synthesis. We obtained 37 isolates, of which 40.6% (n = 15) were resistant to meropenem. In all isolates (100%, n = 37) the blaKPC gene was detected, while blaVIM was not present in any (0%, n = 0). The blaIMP was found in 8.1% (n = 3) of the isolates, in which two presented sensitivity to meropenem. In all isolates (100%, n = 37) the blaKPC gene was detected, while blaVIM was not present in any (0%, n = 0). The blaIMP was found in 8.1% (n = 3) of the isolates, in which two presented sensitivity to meropenem. As for the virulence genes, 51.3% (n = 19) had the mrkD gene, whereas cpsP was present in all the isolates analyzed (100%, n = 37). Related to the hospitals, in C there was a greater number of MDR isolates (A = 13, B = 3, C = 21); isolates resistant to meropenem (A = 6, B = 1, C = 8) and isolates with the mrkD gene (A = 2; B = 1; C = 16). However, there was no predominance in the presence of the blaIMP gene (A =; B = 1; C = 1). We observed that a large number of isolates were sensitive to meropenem (59.4%, n = 22) even in the presence of the carbapenemase encoding gene blaKPC. Thus, further studies based on gene expression and tests with other carbapenems are necessary for a better understanding of these results. In this study, a high incidence of the blaKPC resistance gene in K. pneumoniae isolates in Maceiô-AL was observed, as well as the presence of the virulence genes cpsP and mrkD, which, together, raise the rate of cell survival in human tissues.

Keywords: Klebsiella, multidrug-resistant bacteria, Healthcare-Acquired Infections

Development Agency: Instituto Aggeu Magalhães (IAM/FIOCRUZ-PE), Laboratório de Imunopatologia Keizo Asami (LIKA/UFPE)