IDENTIFICATION AND MOLECULAR CHARACTERIZATION OF NEW DELHI METALLO-ß-LACTAMASE (NDM) PRODUCING Klebsiella pneumoniae FROM SALVADOR HOSPITALS

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ABSTRACT:

The spread of antimicrobial resistant bacteria is a public health threat worldwide, limiting therapeutic options. The emergence of new resistance markers, especially New Delhi Metallo-ß-lactamase (NDM), is a major concern due to its ability to hydrolyze carbapenems, a broad-spectrum drug used in the treatment of infections caused by multidrug-resistant microorganisms (MDR). In Brazil, the first case of NDM was described in 2013 in the city of Porto Alegre. Since then, the number of patients infected with bacteria harboring the NDM gene is increasing. Accordingly, the objective of this study was to characterize the molecular profile of multidrug-resistant Klebsiella pneumoniae harboring blaNDM (KP-blaNDM) gene in Salvador, Bahia. A cross-sectional study was carried out from April 2016 to December 2018. The population studied was composed of patients without age restriction and BSI caused by K. pneumoniae. Bacterial identification and antimicrobial susceptibility tests were conducted using the Vitek2 system (BioMérieux, France). The presence of resistance genes was investigated by PCR. Clonal relatedness was determined by Pulsed-field Gel Electrophoresis (PFGE). The NDM gene was identified in 11% of the K. pneumoniae isolates (14/126). The patients with KP-blaNDM bacteremia were more likely to be female (57.2%) and to be older (≥ 60 years old - 78.5%). The MDR isolates were resistant to penicillins (Ampicillin/sulbactam and Piperacillin/Tazobactam), cephalosporins (Cefepime, Ceftazidime, and Ceftriaxone), Quinolones (Ciprofloxacin) and Carbapenems (Imipenem, Ertapenem). However, these isolates showed high susceptibility to tigecycline (86.6%). Other resistance genes expressed by these isolates were blaVIM and blaKPC. Analysis by PFGE demonstrated different clonal profiles among the strains, evidencing a non clonality between them. Here we have demonstrated that KP-blaNDM isolates are associated with MDR profile, posing a challenge for infection control committees in this setting.

Keywords: New Delhi Metallo-ß-lactamase, Klebsiella pneumoniae, multidrug-resistance

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