TITLE: IDENTIFICATION AND MOLECULAR CHARACTERIZATION OF NEW DELHI METALLO-B-LACTAMASE (NDM) PRODUCING K*lebsiella pneumoniae* FROM SALVADOR HOSPITALS

AUTHORS: Silva, G.E.O.[1]; Silva, N.S.[1]; Leal, H.F.[2]; Bonfim, A.P.[1]; Barberino, M.G.[3]; Gouveia, E.L.[4]; Reis, M.G.[2] and Reis, J.N.[1,2]

INSTITUTIONS: 1 Laboratory of Research on Clinical Microbiology (LPMC), School of Pharmacy, Federal University of Bahia, Ondina, 40170-115, Salvador, Bahia, Brazil

2 Laboratory of Pathology and Molecular Biology (LPBM), Gonçalo Moniz Research Institute, Oswaldo Cruz Foundation, Candeal, 40296-710, Salvador, Bahia, Brazil

3 São Rafael Hospital, São Marcos, 41253-190, Salvador, Bahia, Brazil

4 Bahia Hospital, Pituba, 40280-000, Salvador, Bahia, Brazil

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-β-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 *bla*$_{NDM}$ (KP-*bla*$_{NDM}$) 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 (BioMèrieux, 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-*bla*$_{NDM}$ 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 *bla*$_{VIM}$ and *bla*$_{KPC}$. Analysis by PFGE demonstrated different clonal profiles among the strains, evidencing a non clonality between them. Here we have demonstrated that KP-*bla*$_{NDM}$ isolates are associated with MDR profile, posing a challenge for infection control committees in this setting.

Keywords: New Delhi Metallo-β-lactamase, K*lebsiella pneumoniae,* multidrug-resistance

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