

TITLE: CHARACTERIZATION OF A NOSOCOMIAL OUTBREAK CAUSED BY NDM-PRODUCING-*Klebsiella pneumoniae* COMPLEX IN A HOSPITAL IN MARÍLIA CITY, BRAZIL

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ABSTRACT

Bacterial multidrug resistance has been a great concern in public health in recent years. Among the multidrug resistant microorganisms, carbapenemase-producing Enterobacterales requires special attention, mainly *Klebsiella pneumoniae* complex isolated from nosocomial infections. Carbapenems were used for a long time to treat infections caused by ESBL-producing Enterobacteriaceae until the spread of carbapenemase-producing microorganisms, including KPC-producers and metallo-beta-lactamases (MBL)-producers. New-Dehli Metallo-beta-lactamase (NDM) is a MBL that causes concern, limiting the therapeutic options for the treatment of infections caused by these microorganisms. The aim of this study was to characterize an outbreak caused by isolates of the MBL-producing *Klebsiella pneumoniae* complex in a hospital in Marília city, Brazil. MBL was phenotypically detected by the hospital laboratory. Thirty-five isolates obtained between June 2019 and January 2020 were sent to the Instituto Adolfo Lutz, Marília, Brazil, for characterization. The detection of resistance genes was performed by multiplex PCR for the *bla*_{KPC}, *bla*_{NDM} and *bla*_{OXA-48} genes. ERIC-PCR was the methodology of choice for performing molecular epidemiological typing. Four isolates were discarded because were duplicates from the same patient. Thirty-one *Klebsiella pneumoniae* complex isolates were analysed, and all (100%) of them were confirmed as NDM-producers. Twelve isolates (39%) were obtained from CSF, blood and urine, 8 (26%) from other clinical samples (skin lesion, tracheal secretion and catheter tip) and 11 (35 %) from surveillance swab. The epidemiological profile showed two clones, "A" and "B". Twenty-nine (94%) isolates were classified as group "A"; 1 (3%) as group "B" and 1 (3%) as non-typeable. In conclusion, NDM-producing *Klebsiella pneumoniae* complex belonging to clone "A" was responsible for an outbreak during the period between June 2019 and January 2020 in a hospital in Marília City, Brazil. The detection of a NDM-producing microorganism causing a nosocomial outbreak, until then isolated with less frequency in the State of São Paulo, is worrisome. Control measures were taken to contain the outbreak.

Keywords: *Klebsiella pneumoniae* complex, metallo-beta-lactamases, NDM, nosocomial infections