TITLE: MOLECULAR CHARACTERIZATION OF *Enterobacter cloacae* PRODUCING KPC-2 ISOLATED IN A TERTIARY CARE HOSPITAL

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ABSTRACT:

E. cloacae is one of the most important Enterobacteriaceae causing life-threatening nosocomial infections, whose treatment is a clinical challenge, mainly due to the overlap of intrinsic and acquired resistance to many antimicrobial agents that lead to multidrug resistance (MDR). In this regard, the increasing rates of carbapenem resistance noticed in the last decade raises concern, since they are the first option for treating infections by MDR Enterobacteriaceae. Hereby, we present the preliminary data of an ongoing study designed to characterize carbapenem resistant E. cloacae causing infections in patients admitted to a tertiary hospital in São Paulo state. Eleven isolates obtained between January 2013 and March 2016 were identified and submitted to antimicrobial susceptibility tests by an automated system. PCR was used to perform the investigation of genes codifying carbapenemases. Molecular typing was performed by Xbal-PFGE and the BioNumerics software was used for dendrogram construction. Isolates presenting similarity \geq 90% were considered as belonging to the same clone. Southern blot analysis on PFGE-S1 gel using specific probes was used for the determination of sizes of plasmids harboring genes codifying carbapenemases and for plasmids typing according to the replicon typing scheme. The majority of the E. cloacae were obtained from urine (6), followed by tracheal aspirate (2), blood (1), catheter tip (1) and tendon biopsy (1). Isolates were distributed among 8 different clones (A-H). The bla_{KPC-2} gene was identified by sequencing in all isolates and was the only determinant for carbapenem resistance. An IncN plasmid of 75Kb was the carrier of *bla*_{KPC-2} gene in 10 isolates, and an IncM of 75Kb was the carrier plasmid of *bla*_{KPC-2} gene in 1. Regarding virulence genes, all isolates presented entB, 9 presented iroN, 2 presented uge and 2 presented mrkD. The plasmidial qac and *qacED1* genes determining resistance to quaternary ammonium based disinfectants were indentified in 6 isolates, and the chromosomal gene *mdfA* in 8 isolates. This data indicate that infections by KPC-2 producing E. cloacae in the studied hospital are caused by different clones and that an IncN plasmid of 75Kb is responsible for the dissemination of bla_{KPC-2} . The combination of resistance genes and virulence genes in *Enterobacter* spp. is alarming, considering that incidence of this pathogen is increasing.

Keywords: *Enterobacter cloacae; bla*_{KPC-2}; Incompatibility group; Virulence genes

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