

TITLE: β -LACTAMASES IN CARBAPENEM-RESISTANT *Enterobacter* spp.: PREVALENCE OF CTX-M-1

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ABSTRACT:

Carbapenem-resistant *Enterobacteriaceae*, including isolates carbapenemases-producing, as well as those combining Extended-Spectrum Beta-Lactamase (ESBL) and/or AmpC with porin loss and/or efflux pump, have become a major public health threat. However, in Brazil, little is known about epidemiological data on molecular characterization of beta-lactamases produced by *Enterobacter* spp., despite of importance of these data for control measures and treatment. This study aimed to characterize beta-lactamases in carbapenem-resistant *Enterobacter* spp. isolates from a public hospital in Maringá, Paraná. Carbapenem-resistant *Enterobacter* spp. isolates between January 2011 and December 2016 from patients at a public hospital were characterized for presence of beta-lactamases genes, including *Klebsiella pneumoniae* carbapenemase (*blaKPC*), Metallo-Beta-Lactamases (*blaIMP*, *blaVIM*, and *blaNDM*), oxacilinase (OXA-48), ESBLs (*blaCTX-M*, *blaTEM*, and *blaSHV*), and plasmid-mediated AmpC, by Polymerase Chain Reaction (PCR). Clonal relatedness was investigated by Enterobacterial Repetitive Intergenic Consensus (ERIC)-PCR method. A total of 54 non-duplicated carbapenem-resistant *Enterobacter* spp. were selected, which 52 and 2 were *E. cloacae* and *E. aerogenes*, respectively. The ESBLs genes were identified by PCR as following: *blaCTX-M-1* (n=24); *blaCTX-M-2* (n=1); *blaCTX-M-9* (n=06); *blaTEM* (n=21); and *blaSHV* (n=1). KPC enzyme was detected in one isolate. Plasmid-mediated AmpC was not found in the isolates studied. All isolates that carried beta-lactamase gene were *E. cloacae* species. ERIC-PCR revealed high genetic diversity, clustering the 54 isolates into 51 different genotypic patterns. The prevalence of ESBL in *E. cloacae* isolates was high, especially CTX-M-1, and ERIC-PCR revealed that carbapenem-resistant *Enterobacter* spp. were genetically diverse and comprised a heterogeneous population.

Keywords: carbapenem resistance, CTX-M-1, *Enterobacter cloacae*