Title: DIVERSITY OF BETA-LACTAMASE GENES IN *ACINETOBACTER* SP. FROM AN ONCOLOGICAL HOSPITAL IN BRAZIL

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ABSTRACT

Acinetobacter calcoaceticus-Acinetobacter baumannii (ACB) complex isolates have been detected among the top five gram-negative bacteria isolated from patients in hospital infections. *Acinetobacter baumannii* is the most important species of the ACB complex and it was recognized as the priority pathogen (critical bacteria), according to World Health Organization (WHO), due to antibiotic multidrug-resistant (MDR) phenotype. The aim of this study was to investigate the diversity of beta-lactamase genes in *Acinetobacter* sp. isolates (n=85) from an Oncological Hospital in Brazil. In addition, *A. baumannii* species were also identified. Extended-spectrum beta-lactamases (ESBL) genes ($bla_{\text{CTX-M groups 1, 2 8, 9 e 25}}$, bla_{GES}, bla_{VEB}, bla_{BEL} and bla_{PER}) and carbapenemases genes (bla_{KPC}, bla_{IMP}, bla_{VIM}, bla_{NDM} and bla_{OXA}) were searched by PCR. $bla_{\text{OXA-51}}$ gene was used to confirm the *A. baumannii* specie. 75/85 (88.2%) of the isolates were identified as *A. baumannii* and the other ones (10/85, 11.76%) were hereafter denominate *Acinetobacter* sp. 56/75 (74.6%) *A. baumannii* also presented $bla_{\text{OXA-23-like}}$ gene and one of them (1.17%) presented $bla_{\text{OXA-48-like}}$ as well. Besides, one *Acinetobacter* sp. presented $bla_{\text{OXA-143-like}}$ gene. In one hand, OXA-23 beta-lactamase is widely disseminated in *A. baumanni*, on the other hand, OXA-48 beta-lactamase is more common in *Enterobacteriaceae*. ESBL genes were also found in the isolates studied, $bla_{\text{CTX-M group 2}}$ (n = 2) and $bla_{\text{CTX-M group 8}}$ (n = 1) genes. CTX-M beta-lactamases are common in *Enterobacteriaceae* and rarely found in *A. baumannii*. The presence of $bla_{\text{CTX-M}}$ and $bla_{\text{OXA-48-like}}$ genes in the isolates studied demonstrates increased horizontal genes transfer, contributing to selection and persistence of MDR isolates, impacting on morbidity and mortality of patients.

Keywords: $bla_{\text{CTX-M}}$, $bla_{\text{OXA-48-like}}$, resistance genes, hospital pathogens, hospital infection

Development Agencies: Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP – 2014/14494-8 e 2015/11728-0),Coordenação de Aperfeiçoamento de Pessoal de Nível Superior, Programa Nacional de Pós-Doutorado (PNPD/CAPES 2015).