

## **TITLE: IDENTIFICATION OF CARBAPENEMASE GENES IN *Acinetobacter baumannii* STRAINS**

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### **Abstract:**

*Acinetobacter baumannii* has emerged an important nosocomial pathogen in outbreaks of hospital infections. *A. baumannii* infections are often difficult to eradicate due to high-level resistance to antibiotics as a result of many both intrinsic and acquired mechanisms.  $\beta$ -lactamase production is the most important mechanism of acquired  $\beta$ -lactam resistance in gram-negative pathogens. Over an 12-month period from January to December 2015, 68 multiresistant *A. baumannii* strains were isolated from 68 patients hospitalized at public hospital located in the city of Dourados in Mato Grosso do Sul. The purpose of the present study was to investigate an outbreak of *A. baumannii* isolated from this hospital and to characterize the resistance mechanism of these strains. Bacterial and antimicrobial susceptibility profiling were done by automated system Phoenix® (BioMérieux) and broth microdilution, respectively. The susceptibility profile showed that 98% (MIC  $\geq$  8) 4.41% (MIC  $\geq$  4) of these strains were resistant to imipenem, and 89.70% (MIC  $\geq$  8) 10.29% (MIC  $\geq$  4) to meropenem. The presence of  $\beta$ -lactamase-encoding genes was evaluated by PCR and DNA sequencing. In total, 66 out of 68 carbapenem-resistant *A. baumannii* strains carried the *bla*<sub>OXA-23</sub> and *bla*<sub>KPC-2</sub> gene was detected in 2 isolates. All strains amplified the *bla*<sub>OXA-51</sub> gene, considered the intrinsic of *A. baumannii*. The *bla*<sub>OXA-24</sub>, *bla*<sub>OXA-58</sub>, *bla*<sub>VIM-1</sub>, *bla*<sub>IMP-1</sub>, *bla*<sub>NDM-1</sub> genes were not detected. In this study we can identify resistance genes encoding  $\beta$ -lactamase in *A. baumannii* strains. However, more studies are needed to evaluate other resistance mechanisms present of these strains. In addition, genetic relatedness among clinical strains will be determined by pulsed-field gel electrophoresis, as well as, the risk factors associated with carbapenemases resistance.

**Keywords:**  $\beta$ -lactamase; Hospital infections; Bacterial resistance.

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