Title: INVESTIGATION OF THE GENETIC ELEMENTS *bla*OXA and ISAba1 IN CLINICAL ISOLATES BELONGING TO *Acinetobacter calcoaceticus - Acinetobacter baumannii* COMPLEX

Authors Kobs, V.C.[1,2], Ferreira, J.A.[1], Bobrowicz, T.A.[1], Ferreira, L.E.[1], Deglmann, R.C.[1], França, P.H.C[1].

Institutuion [1] UNIVILLE- Universidade da Região de Joinville, Molecular Biology Laboratory (Rua Paulo Malschitzki 10 – Campus Universitário, Zona Industrial-Joinville - SC), [2] HDH – Hospital Dona Helena (Rua Blumenau 123, Centro – Joinville –SC).

Abstract:

Nosocomial infections are the most frequent complications occurring in hospitalized patients and constitute a serious public health problem associated with significant morbidity and mortality rates. The genus *Acinetobacter* is recognized as an important pathogen causing nosocomial infections and numerous outbreaks caused by multidrug-resistant representatives of the *Acinetobacter calcoaceticus - Acinetobacter baumannii* complex have been reported in several countries. In these microorganisms, the OXA-type carbapenemases, enzymes classified in group D of Ambler, correspond to the main mechanism responsible for resistance to carbapenems. The most commonly identified are described as $bla_{\text{OXA-23-like}}$, $bla_{\text{OXA-24-like}}$, $bla_{\text{OXA-58-like}}$, $bla_{\text{OXA-143}}$ and $bla_{\text{OXA-51-like}}$, the last one being considered intrinsic to the species *A. baumannii.* It has been documented that higher rates of hydrolysis of carbapenems are due to the acquisition of insertion elements close of bla_{OXA} genes. Additionally, it has been demonstrated that some insertion sequences (IS), especially ISAba1, enhance the expression of resistance to carbapenems in the *A. calcoaceticus - A. baumannii* complex. Therefore, it was investigated the occurrence of the genetic elements *bla*OXA and ISAba1 in clinical isolates retrieved from patients with nosocomial infection, identified between March 2009 and March 2015, belonging to the *A. calcoaceticus - A baumannii* complex, and their relationship with the phenotypic profile of susceptibility to carbapenems at Hospital Dona Helena in Joinville-SC. The data related to the phenotypic profile were collected by the Hospital Infection Control Service of the institution. The joint investigation of the five families of genes encoding oxacilinases - $bla_{\text{OXA-23-like}}$, $bla_{\text{OXA-24-like}}$, $bla_{\text{OXA-58-like}}$, $bla_{\text{OXA-143}}$, $bla_{\text{OXA-51-like}}$ - and ISAba1 was performed by Multiplex PCR. All (84) the tested isolates showed $bla_{\text{OXA-51}}$. Seventy-eight (92.9%) had the $bla_{\text{OXA-23}}$ and ISAba1 elements, and most of these (76; 97.4%) were resistant to imipenem and meropenem. Six (7.1%) isolates exclusively positive for $bla_{\text{OXA-51}}$ showed sensitivity to carbapenems. There were no isolates carriers of $bla_{\text{OXA-24-like}}$, $bla_{\text{OXA-58-like}}$ or $bla_{\text{OXA-143}}$ genes. It was concluded, therefore, that the elements $bla_{\text{OXA-23}}$ and ISAba1 in the *A. calcoaceticus - A baumannii* complex might be considered resistance markers to carbapenems, justifying the resistance profile observed in the hospital analyzed.

Keywords: *Acinetobacter baumannii* complex**,** *Acinetobacter calcoaceticus*, *bla*OXA, ISAba,

Development agency: FAP-UNIVILLE.