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

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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 blaOXA-23-like, blaOXA-24-like, blaOXA-58-like, blaOXA-143 and blaOXA-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 blaOXA 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 blaOXA 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 - blaOXA-23-like, blaOXA-24-like, blaOXA-58-like, blaOXA-143, blaOXA-51-like - and ISAba1 was performed by Multiplex PCR. All (84) the tested isolates showed blaOXA-51. Seventy-eight (92.9%) had the blaOXA-23 and ISAba1 elements, and most of these (76; 97.4%) were resistant to imipenem and meropenem. Six (7.1%) isolates exclusively positive for blaOXA-51 showed sensitivity to carbapenems. There were no isolates carriers of blaOXA-24-like, blaOXA-58-like or blaOXA-143 genes. It was concluded, therefore, that the elements blaOXA-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, blaOXA, ISAba,

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