

TITLE: MOLECULAR INVESTIGATION OF *ACINETOBACTER CALCOACETICUS* - *ACINETOBACTER BAUMANNII* CLINICAL ISOLATES RESISTANT TO CARBAPENEMS

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ABSTRACT

At present, multidrug-resistant gram-negative bacilli, mainly *Acinetobacter baumannii*, *Klebsiella pneumoniae* and *Pseudomonas aeruginosa*, are responsible for the majority of pneumonias of patients admitted to the intensive care units (ICU). Carbapenems are the antibiotics of choice for these healthcare-associated infections (HAI), but the emergence of diverse resistance mechanisms has substantially reduced the effectiveness of antimicrobial regimens. It is well recognized that patients at ICU are more vulnerable to bacterial infections and the appearance of drug resistance worsens the prognosis. The study describes the molecular characteristics of multidrug-resistant *Acinetobacter calcoaceticus* - *Acinetobacter baumannii* (Acb) complex isolates from adult patients at two general hospitals in Joinville, Santa Catarina, Brazil. There were included 41 isolates showing phenotypic resistance to imipenem, meropenem, piperacillin/tazobactam, ceftazidime, and cefepime (100%), ciprofloxacin (84.6%), gentamicin (88%), and amikacin (58%) obtained from March 2009 to December 2014. All isolates were identified by the automated systems MicroScan WalkAway (Siemens, Munich, Germany) or VITEK 2 Compact (bioMérieux, Marcy l'Etoile, France) and the determination of the antibiotics susceptibility profile was performed using the disc-agar diffusion technique, as recommended by Clinical & Laboratory Standards Institute (CLSI) guidelines. Investigation of genes *bla*_{OXA-51-like}, *bla*_{OXA-23-like}, *bla*_{OXA-24-like}, *bla*_{OXA-58-like}, *bla*_{OXA-143-like}, and *bla*_{NDM-1} was performed by Polymerase Chain Reaction. An association of genes *bla*_{OXA-51-like} and *bla*_{OXA-23-like} was detected in 80.5% of the isolates, while solely presenting genes *bla*_{OXA-51-like} or *bla*_{OXA-23-like} occurred in 7.3% and 2.4% of cases, respectively. Two (4.8%) isolates did not show any of the investigated genes, as well as genes *bla*_{OXA-24-like}, *bla*_{OXA-58-like} and *bla*_{OXA-143-like} were not detected. Of note, it was confirmed - for the first time in Joinville - two (4.8%) *A. baumannii* isolates carrying gene *bla*_{NDM-1} and presenting resistance to ampicillin/sulbactam, piperacillin/tazobactam, imipenem, and meropenem. We emphasize that the emergence of this variant encoding *New Delhi* metallo-beta-lactamase-1 underscores the need for routine vigilance and the adoption of preventive measures against the dissemination of this clone in Brazil.

Keywords: Healthcare-associated infections, Carbapenem resistance, *Acinetobacter baumannii*

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