

TITLE: PHENOTYPIC AND MOLECULAR CHARACTERIZATION OF CARBAPENEM-RESISTANT *ACINETOBACTER* SPP. STRAINS ISOLATED FROM DIFFERENT BRAZILIAN STATES

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ABSTRACT:

Acinetobacter spp. are opportunistic human pathogens of great clinical and epidemiological relevance, being one of the main causes of Healthcare-Associated Infections (HAI) worldwide. Dissemination of carbapenem-resistant *Acinetobacter* (CRA) is currently an emerging global threat for healthcare systems. With the increase in the use of colistin to treat CRA infections, resistance to colistin is emerging. The aim of this study was to perform the phenotypic and molecular characterization of clinical CRA isolates. A total of 151 strains nonduplicated CRA were isolated from eight Brazilian states over the period from January 2017 to January 2020. The strains were identified by conventional biochemical tests and detection of *bla*_{OXA-51} gene by PCR assay; susceptibility profile to 10 antimicrobials were determined by disk diffusion, to colistin and tigecycline was used broth microdilution and Etest® strips, respectively. The main carbapenemase genes were screened by PCR assay, and the PFGE was performed to determine the genetic diversity of strains. All 151 CRA isolates were resistant to imipenem and meropenem, and the rate of resistance to other eight antimicrobials ranging from 64 to 97%. Our findings revealed a low susceptibility rate to tigecycline (3%). The rate of colistin resistance (ColR) was 17% (n=25). A total of 79% of the isolates were classified as XDR, 14% as MDR and 7% were resistant to all antimicrobials tested. PCR identified the coexistence of *bla*_{OXA-51-23-like} (63%), *bla*_{OXA-51-143-like} (24%), *bla*_{OXA-51-24-like} (8%) and *bla*_{OXA-51-NDM} (1%). Some isolates were positive for only one gene: *bla*_{OXA-24} (1%), and *bla*_{NDM} (1%). The *bla*_{OXA-51-23-like} genes were found in 72% of ColR strains. PFGE yielded 35 different pulsotypes, showing a high clonal diversity; the most common types were U (18%), Y (11%), M (9%) and V (8%). Pulsotype Y was the most distributed (five Brazilian states) and all strains were positive for *bla*_{OXA-51-23-like}. The *bla*_{OXA-51-23-like} were detected in 24 pulsotypes, the *bla*_{OXA51-143-like} in 10 pulsotypes and the *bla*_{OXA51-24-like} in 9 pulsotypes. This study provides important epidemiological data on CRA strains circulating in different regions of Brazil, presenting high resistance rate; non-susceptible to last-resort antimicrobials, such colistin and tigecycline; and transmissible carbapenemase genes. Thus, applying adequate strategies to limit the spread of these strains and implementing correct antimicrobials measures are necessary.

Keywords: *Acinetobacter* spp.; Antimicrobial resistance; Carbapenem-resistance; Healthcare-Associated Infections (HAIs).

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