TITLE: Spread of IMP-1 among *Acinetobacter* non-*baumannii* species

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ABSTRACT:

In the last years, carbapenem resistance in *Acinetobacter* species was mostly restricted to *Acinetobacter baumannii* isolates. However, other *Acinetobacter* species have recently emerged as important nosocomial pathogens and, in some cases, presenting high levels of antimicrobial resistance, including to carbapenems. Carbapenem resistance among *Acinetobacter* spp. is mainly due to carbapenem-hydrolyzing class D β-lactamases (CHDLs) production. The aim of this study was to characterize the presence of beta-lactamase encoding genes in distinct species of *Acinetobacter* spp. isolated from Brazilian hospitals. The identification at the species level was performed by amplification and sequencing of *rpoB* gene. The detection of β-lactamases encoding genes and the characterization of their genetic context was performed by PCR using specific primers, followed by sequencing. Antimicrobial susceptibility testing for several antimicrobials was evaluated by broth microdilution and interpreted according to BrCAST/EUCAST criteria. The genetic relationship among isolates belonging to the same species was determined by ApaI-PFGE. Five carbapenem-resistant *Acinetobacter* spp. isolates recovered from two distinct hospitals between 2000 and 2016 were included in this study. *rpoB* sequencing identified them as *A. pittii* (n=2), *A. berezinae* (n=2), and *A. junii/grimontii* (n=1) species. All isolates harbored bla_{IMP-1}, which was inserted in the class I integron In*86*. These isolates showed high MICs to ampicillin/sulbactam, broad-spectrum cephalosporins, imipenem, meropenem, and amikacin. In contrast, the *A. pittii* and *A. junii/grimontii* isolates were susceptible to fluoroquinolones. Both *A. pittii* isolates were also susceptible to gentamicin. Only minocycline, tigecycline and polymyxin B were active against all isolates. PFGE analysis showed that both *A. pittii* were identical, and the two *A. berezinae* isolates were considered as clonally related. In this study, we demonstrated that mobile elements carrying carbapenemase encoding genes such as In*86* may persist for a long period allowing their mobilization from *A. baumannii* to other Acinetobacter spp. usually susceptible to multiple antimicrobials. Our results also emphasize the need of proper implementation of infection control measures and adequate species identification in order to avoid patient-to-patient spread and determine the specific epidemiological role exerted by other *Acinetobacter* species.

Keywords: *A. bereziniae*; *A. pittiii;* In*86;* Metallo-β-lactamase.