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Persistence of blaIMP-16-producing Pseudomonas aeruginosa associated with ST308 clone

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Background. P. aeruginosa (Pae) is one of the most clinically important specie causing different kinds of human infections. Pae has resistance intrinsically to several drugs, and clinical isolates frequently acquired additional mechanisms of resistance. The antimicrobial treatment is real problem due to the limited antimicrobial options. The metallo-beta-lactamases (MBLs) IMP and VIM are the most common ones, and the blaIMP and blaVIM genes are born mobile gene cassettes inserted in integrons.
Objective. To describe the epidemiology of clinical isolates of Pae producing IMP-16 MBL.

Methods. Nine IMP producing-Pae isolates were received to the National Reference Laboratory between November-2005 and April-2010 from 6 hospitals of the Buenos Aires Metropolitan Area (BAMA). Isolates were recovered from urine (5), BAL (1), catheter (1), wound (1) and bone (1). MBL-production was evaluated by synergism between carbapenems and EDTA/SMA discs and by the MHT. MIC was determined by agar dilution (CLSI). Detection of blaVIM, blaIMP and blaNDM genes was performed by PCR and confirmed by sequencing. Integron array was evaluated by PCR combining different primers (5CS, 3CS, tniC-F, VIM-F, VIM-R) and DNA sequencing. Genetic relation was evaluated by PFGE. MLST was performed according pubmlst web page.

Results. MBL production was positive by the MHT and carbapenem/EDTA synergism. Imipenem (IMI) and meropenem MICs were between 2-128 mg/L (only one susceptible isolate) and 16-32 mg/L, respectively. Strains remained generally susceptible to amikacin (8/9), colistin (9/9), and aztreonam (6/9). Eight out nine isolates were genetically related by XbaI- and SpeI-PFGE, and beloged to ST308. ST308 isolates harbored the blaIMP-16 gene as first cassette in class 1 integron, followed by a blaOXA-2 and gcuD cassettes. The remaining isolate belong to ST235 and the blaIMP-16 gene was the first cassette but the 3´region could not be characterized.

Conclusion. The persistence of blaIMP-16 gene in the BAMA was mainly associated with ST308 clone harboring a new integron array. To the best of our knowledge this is the first report of blaIMP-16 gene associated to ST308 and ST235, and the first description of these clones in our country.