

Título: Outbreak of carbapenem-resistant *Pseudomonas aeruginosa* infection in a Brazilian pediatric oncology hospital

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Resumo:

Pseudomonas aeruginosa is an important nosocomial pathogen associated with high mortality rates and can persist in moist environments in hospitals. Carbapenems generally represent the last drugs resort in treating life threatening infections caused by *P. aeruginosa* because of their stability against most β -lactamases. However, production of acquired metallo- β -lactamases like SPM-1 has been frequently reported among Brazilian hospitals causing several infections. Here, we report an outbreak of carbapenem-resistant *P. aeruginosa* possessing the *bla*_{SPM-1} M β L coding-gene affecting 9 patients under cancer treatment at the Institute of Pediatric Oncology, IOP-GRAACC-UNIFESP, Brazil. During November 2011 to May 2012, nine carbapenem-resistant strains were isolated from 9 patients from blood (n=7) and urine (n=2) admitted at the IOP-UNIFESP. Identification and susceptibility profile were determined by Phoenix automated system. Since these isolates were resistant to carbapenems they were referred to the LEMC, UNIFESP, Brazil for further molecular characterization. Genomic DNAs were extracted using the QIAamp DNA mini-kit (Qiagen, USA). Detection of the *bla*_{SPM-1} encoding gene was carried out by real-time PCR on Rotor-gene Q instrument (Qiagen,USA) followed by DNA sequencing (ABI sequencer, Applied Biosystems, USA). Clonal relatedness was evaluated by pulsed field gel electrophoresis (PFGE) using the *SpeI* restriction endonuclease (New England BioLabs, USA). The band patterns were analyzed using the Bionumerics Software version 6.6 (Applied Maths, Belgium). All those nine isolates were identified as *P. aeruginosa* and were positive for the *bla*_{SPM-1} gene. PFGE analyzes demonstrated three different clusters: A, B and C. Two samples were highly related to the endemic clone SPM-1 previously reported in the institution. Three patients were previously colonized by *P. aeruginosa* and one had a contaminated prosthesis before the infection episode. Three patients were under haemodialysis. Among nine patients, all those had the strain isolated from blood died. This outbreak with high mortality rate reinforces that the SPM-1 endemic clone may be adapted to spread in nosocomial settings. This fact demonstrates the urgent need for early diagnosis of bloodstream infections and actions to prevent further spread of these microorganisms.

Palavras-chaves: *Pseudomonas aeruginosa*. Metallo-Beta-Lactamase, Surto