

Título: Clonal evolution and resistance *Pseudomonas aeruginosa* over 20 years in Rio de Janeiro.

AUTORES: SANTOS, I. C. O. <sup>1</sup>, PEREIRA, N. F.<sup>1</sup>, ACCAMPORA, M. L.<sup>1</sup>, MARQUES, E.A.<sup>2</sup>, PEREIRA, N. F.<sup>1</sup>, ASENSI, M. D.<sup>1</sup>, CARVALHO-ASSEF, A. P. D'A.<sup>1</sup>

Instituição: <sup>1</sup> IOC – FIOCRUZ. Instituto Oswaldo Cruz, Fundação Oswaldo Cruz ( Av. Brasil No. 4365, Manguinhos - Rio de Janeiro, RJ – Brasil).

<sup>2</sup> UERJ – Universidade do Estado do Rio de Janeiro (R. São Francisco Xavier, 524 - Maracanã, Rio de Janeiro – RJ - Brasil)

Resumo:

*Pseudomonas aeruginosa* has been showing resistance to different antimicrobial agents since 1991, date of the first outbreak in Brazil. Nowadays, the main concern is given by the carbapenems, aminoglycosides and quinolones resistance. The objective of this study was identify genetic markers of resistance and clonal diversity of *P. aeruginosa* in the Rio de Janeiro state isolated from 1995 to 2014. In this study, were included a total of 83 isolates recovered from 11 hospitals belonging the Collection of hospital-acquired bacteria (CCBH) at the Instituto Oswaldo Cruz – Fiocruz. These isolates were recovered from different clinical specimens, the most frequent were: respiratory tract (29%) and bloodstream (22%). The isolates were submitted to antimicrobial susceptibility by disc diffusion method, colorimetric detection of hydrolysis of imipenem (CARBA-NP) and PCR to detect carbapenemase genes (IMP, VIM, NDM, SPM, KPC, GES, OXA-48). Molecular typing was performed by PFGE and analysis by BioNumerics. The rates of non-susceptibility were: ticarcillin/clavulanate (55,5%), imipenem (32,60%), ciprofloxacin (31,3%), levofloxacin (31,3%), gentamicin (22,9%), meropenem (22,9%), aztreonam (22,9%), ceftazidime (20,5%), piperacillin/tazobactam (16,9%), amikacin (15,7%), doripenem (14,4%), cefepime (13,2%). In the period 1995-2000, the resistance to quinolones, aminoglycosides and carbapenems was 12.5%, 12.5% and 4.2%, in 2001-2006 increase to 30%, 40% and 20% and in 2007-2014 increased to 41.7% 31.25% and 54.2% respectively. Two isolates recovered in 2007 and 2010 were *bla*<sub>SPM</sub>-positive and showed hydrolysis of imipenem. No other carbapenemase was detected. The clonal profile obtained by PFGE showed the great genetic diversity. Only three clonal groups were detected in more than 3 isolates, clonal group G (n=6), clonal group O (n=5) and clonal group U (n=5). Clonal group G was detected only in the first period of study (1995-2000). The clonal group O was observed in 1999 and from 2007 to 2011. The 2 *bla*<sub>SPM</sub>-positive isolates and a ST277 reference isolate belonged to clonal group U. This clone (ST277) is an epidemic clone that is widespread in Brazil since 1993 carrying *bla*<sub>SPM</sub> gene. This study shows the evolution of antimicrobial resistance in *P. aeruginosa* over 20 years in Rio de Janeiro. Although the resistance has increased over the years, no prevalent clone was noted, which warns to the important role of selective pressure resistance in *P. aeruginosa*.

Palavras-chaves: *Pseudomonas aeruginosa*, resistance, carbapenemases, molecular typing, clonal evolution.

Agência de fomento: CAPES, FAPERJ, CNPq.