TITLE: Coprodution of KPC and SPM carbapenemases by *Pseudomonas aeruginosa* in same hospital in Northern Brazil.

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ABSTRACT:

Pseudomonas aeruginosa is one of the most common opportunistic pathogens associated with nosocomial respiratory infections. Its adaptation to the hospital environment, coupled with the high level of intrinsic resistance and its ability to acquire additional resistance mechanisms make antimicrobial therapy challenging in hospitals around the world. Among these mechanisms, carbapenemases are particularly important because of the easy of intra and interspecies dissemination. This study aimed to report the occurrence of *P. aeruginosa* isolates accumulating two differents enzymatics mechanisms of resistance to carbapenems. The isolates are part of the collection of cultures from the Section of Bacteriology and Mycology of the Evandro Chagas Institute, received from hospitals in the northern region of Brazil, from january 2018 to may 2019, for epidemiological surveillance of bacterial isolates resistant to carbapenens. The detection of genes encoding carbapenemases was performed by PCR, where the presence of the genes bla_{KPC}, bla_{NDM}, $bla_{OXA\text{-}48\text{-}LIKE}$, bla_{IMP}, bla_{VIM} and bla_{SPM} were investigated. Among the total of 84 *P. aeruginosa* isolates, ten (12%) were producers of SPM type carbapenemase. Among these isolates, five were recovered at the same hospital, obtained from tracheal secretion and urine, was observed the simultaneous presence of the bla_{KPC} and bla_{SPM} genes. It is worth noting that the phenotypic test using EDTA and phenylboronic acid was negative in these isolates. We report the presence of two differents carbapenemases (KPC and SPM) in five clinical isolates of *P. aeruginosa*. The production of carbapenemases in *P. aeruginosa* is still relatively rare in the northern region. However, these findings demonstrate the ability of this microorganism to act as reservoir and dispersion vector of resistance determinants. This coproduction points to a possible change in the genetic context that can confer a high level of resistance to carbapenems, and it is necessary to evaluate their impact on patients' morbidity and mortality. We also emphasize the importance of monitoring these pathogens as a strategy to minimize the circulation and dissemination of these resistance mechanisms in hospitals.

Keywords: *P. aeruginosa*, carbapenemase, coprodution.

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