TITLE: ANTIMICROBIAL ACTIVITY OF PROMETHAZINE AGAINST MULTIRESISTANT STRAINS OF *PSEUDOMONAS AERUGINOSA*

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ABSTRACT:

Multiresistant *Pseudomonas aeruginosa* strains represent a major health problem worldwide, because intrinsic and acquired antibiotic resistance makes this bacterium one of the most difficult organisms to treat. While the overexpression of efflux pumps is an important mechanism of antimicrobial resistance in this genus. In this context, this work aimed to evaluate the antimicrobial activity of promethazine against multiresistant strains of *Pseudomonas aeruginosa*. Promethazine is commonly used as antidopaminergic, antihistamine and anticholinergic drug, which also has been described as an inhibitor of microbial efflux pumps. Therefore, *Pseudomonas aeruginosa* isolates were processed by the clinical microbiology laboratory of the University Hospital Walter Cantídio (HUWC). Then, identification and antimicrobial susceptibility testing were performed using the Vitek-2 automatic system (bioMérieux™). *P. aeruginosa* strains were selected when they showed resistance to 3 or more classes of antimicrobials. Thus, nineteen multidrug-resistant strains were sent to the Bacteriology Laboratory linked to the Postgraduate Program in Medical Microbiology (PPGMM) of the Federal University of Ceará (UFC) where the susceptibility tests were performed using promethazine of the strains in planktonic and biofilm forms. The Minimum Inhibitory Concentrations (MIC) of promethazine ranged from 390.62 µg/mL to 781.25 µg/mL. The Minimum Biofilm Elimination Concentrations (MBECs) of promethazine ranged from 781.25 µg/mL to 3,125 µg/mL, inducing a significant reduction in biofilm biomass from 48 µg/mL. Therefore, promethazine has antimicrobial activity against multiresistant *P. aeruginosa* strains in planktonic and biofilm forms, creating hopeful perspectives in the context of drug repositioning, in which can be used in association with classic antibiotics as an adjuvant to sensitize bacteria.

Keywords: multidrug-resistant, biofilm, drug repositioning, efflux pump

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