

TITLE: EFFECTS OF 1,10-PHENANTROLINE AND ITS DERIVATIVES ON CARBAPENEMASE-PRODUCING *ACINETOBACTER BAUMANNII* CLINICAL STRAINS.

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ABSTRACT:

Acinetobacter baumannii is an opportunistic human pathogen responsible for acute and chronic infections with high morbidity and mortality. Its pathogenicity comes from the genetic and metabolic plasticity, intrinsic and acquired antimicrobial resistance. Due to the indiscriminate use of antimicrobials and their empirical administration, the high level of emergence of antimicrobial resistance is a real problem and is a new challenge for medical therapy. In this context, the multidrug resistant (MDR) strains of *A. baumannii*, especially to carbapenems, are relevant problems in the clinical arena. Therefore, there is a need for the discovery and development of new therapeutic options through research on the action of natural and synthetic products that have antimicrobial activity against *A. baumannii*. Our study aimed to evaluate the effect of 1,10-phenantroline (phen), 1,10-phenantroline-5,6-dione (phendione), [Cu(phendio)₃](ClO₄)₂.4H₂O (Cu-phendione) and [Ag(phendio)₂]ClO₄ (Ag-phendione) on 26 carbapenem-resistant *A. baumannii* clinical strains carrying the *bla*_{OXA} gene. All the isolates showed a high percentage of antimicrobial resistance, with 80.7% (21/26) resistant to at least 3 antimicrobial classes, being considered MDR and 7.7% (2/26) resistant to all tested antimicrobials, classified as pan-drug resistant (PDR). Minimum inhibitory concentrations (MICs) of the compounds were determined by the microdilution method using a 96-well microtiter plate with adjusted Mueller-Hinton broth containing 1.5625 to 200 µg/ml of the test compounds. The values corresponding to MICs capable of inhibiting 50% (MIC₅₀) and 90% (MIC₉₀) of bacterial growth were 12.5 µg/ml for phen, 1.562 µg/ml for both the phendione, Ag-phendione, and Cu-phendione, respectively. Phen and its derivatives showed a potent inhibitory effect on carbapenemase-producing *A. baumannii* strains. The low MIC for 1,10-phenanthroline and its derivatives is indicative of promising results since studies on the toxicity of these compounds have already demonstrated good tolerance for mammals. Financial support: CAPES, FAPES, FAPERJ and CNPq.

Keywords: *Acinetobacter baumannii*, carbapenem, 1,10-phenantroline, coordination compounds

Development Agency: CAPES, FAPES, FAPERJ, CNPq