

TITLE: EVALUATION OF THE MINIMUM INHIBITORY CONCENTRATION OF QUINOXALINES AGAINST BACTERIA OF CLINICAL IMPORTANCE.

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ABSTRACT:

Quinoxalines are heterocyclic compounds that have antimicrobial capacity against resistant bacteria, even the mechanisms responsible for their activity are not yet fully understood. Bacterial resistance is a natural process, which develops from genetic changes that occur over time. However, the excessive use of antibiotics causes the acceleration of this process, putting traditional antimicrobials in disuse. The need for new therapeutic alternatives in the treatment of multiresistant bacteria is evident, since the search for synergism between new drugs or substances aims at a greater prophylaxis efficiency and less toxicity to the user. Therefore, the objective of this study was to evaluate the antimicrobial viability of quinoxaline derivatives against bacteria of clinical importance. The strains of *Escherichia coli* ATCC 25922, *Staphylococcus aureus* ATCC 25923 e *Klebsiella pneumoniae* ATCC 10031, were adjusted to the scale of ,5 McFarland ($1,5 \times 10^8$ UFC/mL) submitted to the minimum inhibitory concentration (MIC) test against quinoxaline isolated from ascorbic acid, with chemical formula N-(2-aminofenil)-3-[(1S,2S)-1,2,3-trihidroxi-propil]quinoxaline-2-carboxamide (AAQX). The methodology used to calculate the dilutions and determine the concentrations of the quinoxaline derivatives tested, N-AAQX e Br-AAQX, followed the description of the Clinical & Laboratory Standards Institute (CLSI), for broth microdilution test. Since AAQX is analogous to the class of antibiotics of quinolones, it assumed the mechanism of action could be similar. However, for the strains studied, there was bacterial growth for all tested concentrations. Because the data on the bacterial activity of AAQX are poorly known, there is a difficulty in establishing the relationship between structure and activity of the compounds tested. Ascorbic acid is an important antioxidant, however, it has been reported that compounds with electron-donor substituent groups have the highest antimicrobial activity when compared to compounds with electron-accepting groups. Some authors report the potential use of AAQX for antibacterial chemotherapy, especially for Gram positive and anaerobic bacteria, and even if the present research does not demonstrate promising results, the possibility of further studies for AAQX antimicrobial activity is not excluded.

Keywords: MIC, AAQX, Bacterial resistance.

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