

ABSTRACT

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Title: Determination of bactericidal efficacy of new disinfectants

Diploma thesis

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Study Program: Pharmacy

Objective: The aim of this study was to compare the antibacterial activity of new quaternary ammonium compounds (QAC) on two bacterial strains, *Staphylococcus aureus* (*S. aureus*) and *Pseudomonas aeruginosa* (*P. aeruginosa*). Effective concentrations were compared with the commonly used disinfectant octenidine dihydrochloride (OCT).

Method: Effective concentrations were determined using a quantitative suspension test according to the European standard ČSN EN 1276. In this method, a microbial suspension is prepared and subsequently exposed to the tested disinfectant under low contamination conditions for a short exposure time. After an incubation period, microbial population growth is analysed using the colony-forming units counting method. Logarithmic reduction is then determined, and results are recorded with a reduction in growth of 5 log units.

Results: OCT and newly prepared compounds with 10-carbon spacer showed the highest antibacterial activity. All tested compounds were generally more effective against Gram-positive (G+) strain compared to Gram-negative strain (G-).

Conclusion: None of the tested compounds demonstrated greater efficacy than the commercially used standard against tested bacteria; however, some compounds exhibited comparable efficacy against specific bacterial strains. These compounds could potentially expand the range of disinfectants in the future and provide alternatives in cases where resistance to currently used agents has been developed.

Keywords: Antibacterial evaluation, Quaternary ammonium compounds, *Staphylococcus aureus*, *Pseudomonas aeruginosa*, Octenidine dihydrochloride, Quantitative suspension test