DEPENDENCE OF MICROBIAL ACTION ON THE SUBSTITUENTS IN THE MOLECULES OF N-, R-ALKYL AMINES

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Introduction. The most common gram-positive pathogens of nosocomial infections are Staphylococcus aureus, coagulase-negative staphylococci and enterococci. This tendency creates significant problems since the choice of antimicrobial agents intended to combat drug resistant gram-positive microorganisms is limited.

Aim. The aim of this work was to determine the effect of various functional groups containing in the molecules of N-, R-alkylamines derivatives on their antibacterial activity in relation to some gram-positive strains of microorganisms.

Materials and methods. In order to determine dependence of the microbiological action on the nature of substituents in the molecules of N-, R-alkylamines the following groups were tested: alkylamines, aminoalcohols, N-hydroxymethyl-N-carboxymethylamines, and N-methyl-N-carboxymethylamines. 1% Aqueous solutions of compounds were tested. In accordance with the WHO recommendations to assess the antibacterial activity of N-, R-alkylamines the gram-positive test strains – Staphylococcus aureus ATCC 25923 and Bacillus subtilis ATCC 6633 were used.

Results and discussion. A low sensitivity of the set of microorganisms used to the action of aliphatic amines was determined. The antimicrobial activity of aminoalcohols was slightly higher, and its enhancement is observed with increasing the number of hydroxyethylene radicals in the molecule. Compounds containing a carboxyl and hydroxymethyl group in the molecule was more active, with the increasing number of hydroxyethylene groups the inhibition zones were 20-21 mm for Staphylococcus aureus and 17-25 mm for Bacillus subtilis. Compounds containing a carboxyl group and methyl radicals appeared to be the most promising among the compounds tested. Increase of the number of methyl radicals in the molecules of compounds leads to a significant increase in activity – the inhibition zones are 39-42 mm.

Conclusions. The effect of various functional groups containing in the molecules of N-, R-alkylamines derivatives on their antibacterial activity in relation to some gram-positive strains of microorganisms has been determined. The aliphatic amines and aminoalcohols studied show a weak or moderate activity in relation to strains of Staphylococcus aureus ATCC 25923 and Bacillus subtilis ATCC 6633. Compounds containing a carboxyl group and methyl radicals in the molecule exhibit the greatest antimirobial activity in relation to the gram-positive strains of microorganisms under research.