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ANALYSIS OF THE DOMINANT MICROBIAL ASSOCIATIONS OF THE MOUTH CAVITY AND THEIR SENSITIVITY TO ANTIBACTERIAL SUBSTANCES

Kostenko O.Ye., Krivtsova M.V., Kostenko Ye.Ya., Savchuk O.V.

Summary: We have proved that in 43,6% of cases from the cell of the inflammatory process bacteria of the genus Staphylococcus were sown; in 27,6% of patients, bacteria of the genus Streptococcus belonging to the S.pyogenes, S.agalactiae, S.viridans, S. mutans, S.pneumoniae species were isolated; In 20% of the patients, the bacteria of the Enterobacteriaceae family were isolated.
A high degree of antibiotic resistance of microorganisms isolated from cells of the inflammatory process was demonstrated: from antiseptics, Decasan showed a wide range of antimicrobial activity, but the dose we applied did not affect Candida spp. The highest anti-staphylococcal action was shown by the antibacterial drug Dioxidine. The antimicrobial effect on the fungi of the genus Candida is found only with the use of chlorhexidine.
Key words: isolates of antibiotic resistance, pathogenic microorganisms, conditionally pathogenic microorganisms, antibacterial activity, antimycotic activity.

Colonization of the mucous membrane with transient and allochthonic microbiota representatives, often possessing multiple resistance to antibiotics, leads to constant recurrence and chronic inflammatory process [10]. It is also established that bacteria that cause inflammatory periodontal disease may be a separate risk factor for cardiovascular, cerebrovascular diseases and premature births [5, 6]. That is why antibacterial drugs are widely used in dentistry, including in the treatment of periodontal tissues [9].

Actuality. Conditionally pathogenic bacteria play a significant role in the development of inflammatory diseases [3, 4]. The growing tendency towards the formation of antibiotic resistant microorganisms causes the relevance of monitoring of microorganisms' sensitivity to antimicrobial drugs and the development of new approaches to antimicrobial therapy [1, 7; 8].

Aim: to study the dominant representatives of microbiotis of the oral cavity, to find their sensitivity to antibacterial substances.

Materials and methods. The collection of biological material from the mucous membrane of the inflammatory process was performed using a sterile transport system, FLmedical (Italy). The material was seeded on a nutrient medium using Salt Field Salt: Sabourund Dextrose Agar (Himedia) for cultivating microscopic fungi; blood agar (MPA+5% blood) - bacteria of the genus Streptococcus and Neisseria; the environment of Endo and Levin (Farmaktiv, Ukraine) - bacteria of the Enterobacteriaceae family, yolk-salt agar with mannitol (Biolif-Italia) - bacteria of the genus Staphylococcus [3]. Bacteria and microscopic fungi were identified by morphological, tinctorial and biochemical characteristics using the systems for identifying the ENTERO-test, STREPTO-test, STAPHYLO-test produced by Erba Lachema (Czech Republic).

The study used commercial domestic antiseptics and antibacterial drugs: Deksasan (Yuriy-Farm, Kiev, Ukraine), Dioxidine (PFM Farmak, Kyiv, Ukraine), Chlorhexidine (PFM Monfarm, Monastyrsche, Ukraine), Metronidazole (Yuriya-Farm, Kyiv, Ukraine).

From the 24-hour culture of microorganisms, the sea buckthorn (inoculum) was prepared in a sterile physiological solution [6]. An inoculum of 100µl corresponding to 0,5 McFarland standard (1,5×108 CFU/ml) was sown on a

Myller Hinton surface agar for bacteria and Saburo agar for microscopic fungi. The optical density was determined on a Biosan densitometer [2].

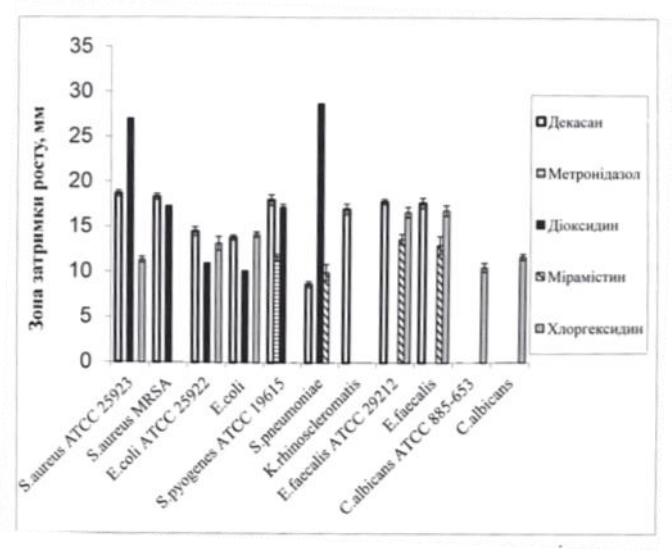
Results. We have proved that in 43,6% of cases from the cell of the inflammatory process bacteria of the genus Staphylococcus were sown; in 27,6% of patients, bacteria of the genus Streptococcus belonging to the S.pyogenes, S.agalactiae, S.viridans, S. mutans, S.pneumoniae species were isolated; In 20% of the patients, the bacteria of the Enterobacteriaceae family were isolated [7].

A high degree of antibiotic resistance of microorganisms isolated from cells of the inflammatory process was demonstrated: from antiseptics, Decasan showed a wide range of antimicrobial activity, but the dose we applied did not affect Candida spp. The highest anti-staphylococcal action was shown by the antibacterial drug Dioxidine. The antimicrobial effect on the fungi of the genus Candida is found only with the use of chlorhexidine.

The research has shown that Decasan antiseptic exhibited a wide spectrum of antimicrobial activity. In particular, the sensitivity of all bacteria taken in the experiment as clinical isolates and typical cultures has been established. The highest levels of antimicrobial activity were recorded for bacteria of the genus Staphylococcus, including methicillin-resistant strains. However, the anti-mycotic action of Dezasan on Candida species in our chosen dose of the drug was not detected.

The high antibacterial effect was observed as a result of the action of Dioxidine, but the parameters of growth retardation zones varied greatly from 30,33±0,58 mm to a clinical strain of S. aureus, to 17,33±0.33 sec on S. aureus MRSA. The high antibacterial activity of dioxidine on S. pneumonia has also been established. No bactericidal activity was detected in E.fecalis and K. rhinoscleromatis. The moderate activity of dioxidine in relation to E. sol is established.

The moderate sensitivity of bacteria of the genus Staphylococcus to chlohexidine is shown, but is much lower than that of Dioxidine and Dexasane. Chlorhexidine did not affect methicillin-resistant S. aureus, no antibacterial effect of chlorhexidine on bacteria of the genus Streptococcus was detected. Sensitive to chlohexidine were E. faecalis and E. coli, but C. rhinoscleromatis was not susceptible to antiseptic. The antimycotic effect of chlohexidine is shown. Miramistin showed moderate sensitivity of E. faecalis, S. pneumonia, S. viridans. Moderate antibacterial activity of metronidazole with S. pyogenes ATCC 19615 is shown.



Pic. 1. Antimicrobial activity of antiseptics and antibacterial substances in relation to typical and clinical isolates of microorganisms

Table 1- Antimicrobial activity of antiseptics and antibacterial substances in relation to typical and clinical isolates of microorganisms, mm

Test-culture	Decasan	Metronidazol	Dioxidine	Miramistine	Chlorhexidine
Staphylococcus aureus ATCC 25923	18,67±0,33[a]	0	27,00±0,58[ab]	0	11,33±0,33[d]
Staphylococcus aureus 1	19,00±0,58[a]	0	18,67±0,33[c]	0	12,33±0,33[c]
Staphylococcus aureus 2	19,00±0,58[a]	0	20,67±0,33[b]	0	10,00±0,58[d]
Staphylococcus aureus 3	19,00±0,58[a]		30,33±0,88[a]	0	17,00±0,58[a]
Staphylococcus aureus 4 (MRSA)	18,33±0,33[a]		17,33±0,33[c]		0
S. haemolyticus (imp)	19,00±1,00[a]	0	20,50±0,50[b]	0	11,50±0,50[d]
S.saprophyticus (imp)	17,83±0,29[c]	0	0	0	10,33±0,58[d]
Streptococcus pyogenes ATCC 19615	18,00±0,58[ab]	11,67±0,33[a]	17,33±0,33[c]	0	0
Streptococcus viridans	19,67±0,33[a]	0	17,00±0,33[c]	12,33±0,33[ab]	0
Streptococcus pneumonia	8,67±0,33[e]	0	28,67±0,88[a]	10,00±0,58[b]	0
Enterococcus faecalis ATCC 29212	17,83±0,29[c]	0	Inhibition of growth	13,67±0,58[a]	16,67±0,58[a]
Enterococcus faecalis	17,67±0,58[c]	0	Inhibition of growth	13,00±1,00[a]	16,83±0,58[a]
Escherichia coli ATCC 25922	14,5±0,5[d]	0	11,00±1,00[d]	0	13,17±0,76b
Escherichia coli	13,83±0,29[d]		10,17±1,24[d]		14,17±0,29[b]
Klebsiella rhinoscleromatis	17,00±0,58[c]	0	0	0	0
Candida albicans ATCC 885-653	0	0	0	0	10,50±0,50 [e]
Candida albicans (clinic)	0	0	0	0	11,67±0,33[d]

Conclusions. Decasan has shown a wide range of antimicrobial activity, but the dose we applied did not affect Candida albicans. The highest anti-staphylococcal action was shown by the antibacterial drug Dioxidine. Anti-myxogenic effect on fungi of the genus Candidia is found only with the use of chlorhexidine.

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