MICROBIOLOGICAL PICTURE OF THE ORAL CAVITY IN THE PRESENCE OF VARIOUS FIXED DENTURES

Mammadova S.,
Doctor of Philosophy in Medicine
Arkhmammadova G.,
Department of Orthopedic Dentistry.Assistent
Hasanova V.
Department of Orthopedic Dentistry assistant
Azerbaijan Medical University,
Baku, Azerbaijan
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Abstract

It is known that the oral cavity is a unique ecological system, closely connected with the internal environment of the body and its external environment. The high incidence of damage to the oral cavity is largely due to the peculiarities of its structure and function, constant contact with the external environment, the presence of microflora, and a variety of loads [1,2,5,7]. When making a denture, it is necessary to take into account the characteristics of the dental and somatic status, as well as the microecology of the oral cavity of patients [3,4,b,8]. The choice of construction material is carried out based not only on its physicochemical characteristics, but also on the biological effect on the surrounding tissues of the oral cavity. In recent years, there has been a significant increase in the number of diseases of the oral mucosa caused by the use of various dentures.

Keywords: metal-ceramic bridges, stainless steel alloys, microecology of the oral cavity.

The purpose of the study is to study the quantitative and qualitative indicators of microflora and oral cavity protection factors in patients using dentures of various designs.

Material and methods We observed 35 patients aged from 28 to 60 years, average age 38.3±2.79 years. The examination was carried out using a set of dental instruments, and the data obtained was entered into a special card. All patients underwent X-ray examinations: orthopantomograms and, if indicated, dental photographs. Before orthopedic dental treatment, oral sanitation was performed. Depending on the method of prosthetics, patients were divided into three groups: group 1 - 12 (34.3%) patients with fixed dentures made of stainless steel with titanium nigrid coating, group 2 - 13 (37.1%) patients with fixed dentures made of metal-plastic, group 3 - 10 (28.6%) patients with fixed dentures made of metal-ceramics. Along with clinical and dental methods, all patients underwent microbiological and immunological studies. Before and after prosthetics, oral fluid was collected from patients in a sterile tube. In the laboratory, serial dilutions were prepared from the obtained material and inoculated onto the surface of differential diagnostic nutrient media. All crops were incubated for 24-72 hours in a thermostat at a temperature of 37°C. After a certain time of cultivation, the Petri dishes were removed and the number of colonies was counted. The number of bacteria of each species was expressed in 1g CFU/ml. In these same patients, nonspecific factors of oral fluid protection were studied. To determine the phagocytic activity of neutrophils in saliva, collection and processing of saliva was carried out according to the method of MA Timurbaev (1989). Lysozyme activity was determined according to the method of Sh.R. Alieva et al. (1996), the level of secretory immunoglobulin A - in the gel precipitation reaction according to the method of Mancini (1964). Microbiological and immunological studies of oral fluid were also carried out in 10 healthy faces with intact dentition. Statistical processing of the research results was carried out using the Student's variation statistics method with the calculation of the arithmetic mean (M), errors of the standard deviation (t), and the degree of reliability (p) according to the Student's T-criterion. Results and discussion Data on the quantitative and qualitative composition of the microflora of the oral fluid are given in the table. The table shows that the oral microflora in healthy people is quite significant and diverse. Thus, the total number of anaerobes, in which lactobacilli predominate, is 1g 5.69±0.15 CFU/ml. At the same time, the number of the optional group is significantly lower. It is mainly represented by streptococci and staphylococci, that is, strains with weak enzymatic properties. The picture is completely different in patients before prosthetics. Thus, the table shows that the number of anaerobes is significantly reduced by 1.6 times, their total number was lg 3.60±0.13 CFU/ml. Among anaerobic microorganisms, the number of lactobacilli decreases by 2 times, as a result of which the ability to regulate pH in the oral cavity is lost, which leads to its change in the neutral direction, and, consequently, to the growth of opportunistic microbes. It should be noted that among anaerobes the number of peptostreptococci increased by 16%, which apparently indicates a compensatory-adaptive reaction of the macroorganism. The facultative group of microbes behaves differently. Firstly, their number reliably exceeds the quantitative indicators of anaerobes. In the facultative group of microbes, there is an increase in both coccal flora and rod-shaped microbes. Microbes belonging to the genus Protea, Klebsiella and fungi of the genus Candida are sown in the highest quantities. Also, strains of microbes are found in the oral cavity that were not

found in healthy individuals, for example, Staphylococcus aureus. It is known that microbes belonging to pathogenic cocci have a large set of pathogenicity enzymes, which, apparently, influence the course of pathological processes in the oral cavity. The number of microbes such as Proteus and Klebsiella is increasing, which, in turn, have high enzymatic activity, especially proteases that cause the breakdown of proteins into final products, that is, hydrogen sulfide, ammonia, indole, etc. (H2S, NH3). In our opinion, it is this process that stimulates one of the clinical symptoms of this disease - the presence of bad odor in the mouth. Analysis of the results of microbiological studies after prosthetics showed that all types of prosthetics in general had a beneficial effect on the state of the microflora of the oral cavity. In patients of three groups, the number of anaerobes, especially lactobacilli, increased by 15.3, 24.2 and 34.2%, respectively, amounting to 2 .60+0.11; 2.90±0.11 and 3.34+0.27 CFU/ml. The facultative group of microbes has also undergone a significant positive shift. Thus, the quantitative indicators for all studied groups of microorganisms, both gram-positive and gram-negative, decreased slightly. Against this background, the number of fungi of the genus Candida decreased, which in patients of the 1st group was 3.00+0.17 1g CFU/ml, in the 2nd group - 2.80+0.14 1g CFU/ml, in the 3rd group - 2.47+0.15 1g CFU/ml. Thus, based on these studies, it can be stated that the use of prostheses made of stainless steel, titanium nitride coating and metal-plastic somewhat improves the severity of dysbiosis, but there is no need to talk about a complete improvement in the microbiological picture. Along with quantitative and qualitative analysis of the microecology of the oral cavity, in patients with fixed dentures made of various materials, we studied the state of local protective factors: lysozyme titer, phagocytic index and the level of secretory immunoglobulin class A (sigA). In the oral cavity, patients have immunodeficiency in all studied parameters . Thus, before prosthetics, the lysozyme titer was 12.3+0.3 mg/% (normally 18.0+0.5 mg/%), the phagocytosis rate was 40.0+2.1% (normally 55.3+2 .5%), slgA level 1.0+0.1 g/l (normal 2.0+0.1 g/l). It can be assumed that of all the studied parameters, the greatest deficit is indices of phagocytosis. Apparently, in the examined patients, local protective factors are primarily disrupted in the oral cavity, which undoubtedly entails the uncontrolled growth of opportunistic and pathogenic microorganisms in the oral cavity and leads to the formation of dysbiosis. We studied the dynamics of local factors protecting the oral cavity in patients. From the data obtained it is clear that patients of all three groups have positive dynamics, however, the most positive changes are recorded in patients of the 3rd group. Their lysozyme level and phagocytosis rate improve, but the content of secretory immunoglobulin remains at the same level. Thus, the content of lysozyme in patients of the 1st group increased by 5.4%, the 2nd - by 12.6, 3rd - by 21.7% and amounted to 13.0 + 0.67, respectively; 13.9+0.68 and 15.7+0.78 mg%. The same dynamics were observed in relation to the phagocytosis index, which in patients of the 1st, 2nd and 3rd groups was equal to 45.1 ± 2.67, respectively; 47.1+2.66 and 50.3+3.46%. Thus, in patients of group 3, the lysozyme titer and phagocytosis index approached control values. The study of factors of local protection of the mouth allows us to conclude that prosthetics for patients with fixed dentures made of metal-ceramics has a more positive effect on the indicators of local protection of the oral cavity. In the early stages (3-6 months) of wearing fixed dentures, patients of groups 1 and 2 showed minor signs of dysbiosis in the oral cavity.

Conclusions

1. The use of prostheses made of stainless steel, titanium nitride coating and metal-plastic somewhat reduces the severity of dysbiosis, but there is no talk of a complete improvement in the microbiological picture.

2. Prosthetics for patients with fixed dentures made of metal-ceramics has a positive effect on the microflora and local protection of the oral cavity.

References:

1. Juldoshhanova O.S., Muhomedovo M.S., Mahkamova D.Je. Sravnitel'naja harakteristika mikroflory i nespecificheskih faktorov zashhity polosti rta u detej s gerpeticheskim stomatitom i kandidozom // Stomatologiya. - 2004. - №3-4. - S. 78-81.

2. Olejnik I.I. Mikrobiologija i immunologija polosti rta - M., 2001.-87 s.

3. Sulemova R.H. Mikrobiologicheskaja ocenka dinamiki mikrobnoj kolonizacii s#emnyh zubnyh protezov s bazisami iz poliuretana i akrilovyh plastmass 7/Sbornik trudov 29-j konferencii molodyh uchenyh MEMSU. - M,, 2007. -S. 442-444.

4. Trezubov V.P., Rozov RA., Petrakov D.S. Klinicheskaja ocenka otdalennyh rezul'tatov protezirovanija metallokeramicheskimi ortopedicheskimi konstrukcijami //Para- dontologija. - 2007. - №1 (42). - S. 64.

5. Carev V.P., Abakarov SP., Umarova SJe. Dinamika kolonizacii mikrobnoj floroj polosti rta razlichnyh materialov, ispol'zuemyh dlja zubnogo protezirovanija7/Stomatologija-2000-T. 79,№1,-S. 55-57.

6. Darby /., Curtis M. Microbiology of periodontal disease in children and young adults//Periodonlology - 2001. - Vol. 26. - P 33-53.

7. tedder P.G. et al, Molecular Analysis of the Subgingival Microbiota in Health and Disease // Appt Environ Microbiol. -2007. - Vol. 43.-P523.

8. Montaram L, Campoccia D, Rizzi S., Donati M. A. Evaluation of bacterial adhesion of Streptococcus mutans on dental restorative materials // J. Biomaterials. - 2003.- VoL 25.-P 3357-4463.