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ANALYSIS AND FORMATION OF THE ETIOPATHOGENESIS OF DYSBIOSIS IN DENTISTRY (literature review)

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Abstract: The formation of normal microbiomaterial of the human oral cavity occurs on the basis of adhesion and the formation of primary colonies of microorganisms to the multilayer flat epithelium of the oral cavity. Scientists identify resistant additional and accidental microflora. A close relationship has been revealed between the formation of resident microflora of the oral cavity during life and such factors as individual features of the structure of the mucous membrane, pathological processes on the oral mucosa, nutrition culture, hygienic aspects, personalized biomechanics of the chewing apparatus, quantitative and qualitative indicators of saliva, saliva secretion, especially in the presence of orthopedic structures. Thus, it was found that even with a violation of the immunophysiological background, the ecosystem of constant normoflora does not participate in the development of dysbiocinosis and has a low pathogenic potential. The causes of changes in the micropease and the occurrence of complications are exogenous factors that disrupt activation by transient and accidental microflora, the ongoing decrease in colonization protection sharply reduces the resistance of the formation of secondary colonization (coadgesis) of opportunistic and pathogenic microorganisms. The additional flora is represented by transient microorganisms coming from the environment, it can be food products, household contact. In a healthy person, representatives of this group are few (up to 105 CFU / 1 ml). With a change in the quantity and quality of the composition of the

resident bacterial flora, violation of the functional usefulness of the oral cavity, anatomical integrity, residents of the transient microflora actively form etiopathogenetic links in the occurrence of pathological processes leading to dysbiosis (including candi dose) of the mucosa and allows us to consider these conditions generalized rather than local.

Key words: dentistry, dental construction materials, diseases of the mucous membrane of the cavities and mouth, dysbiosis, candidiasis, risk factors, oral microflora

The social significance of the complexity of diagnosing diseases of the oral mucosa in dental practice is determined by a wide variety, polyethologicity, complexity of the mechanism of development of pathological changes, similarity of various forms of mucosal lesions in the clinical picture. At the present stage of development of dental science, there is 100% evidence of syntropy of pathological changes in the oral cavity and diseases of internal organs and systems (gastrointestinal tract, endocrine system, cardiovascular, respiratory and nervous systems, chronic renal failure, blood clotting disorders, hypo and vitamin deficiency, etc.) [4]. A wide variety of pathological changes in the oral mucosa can be divided (classified) into local lesions of the oral mucosa, the term "true diseases of the oral mucosa" and manifestations (lesions) of somatic diseases on the oral mucosa can be found in the literature [21]. The difficulties encountered in clearly distinguishing the etiopathogenesis of the above two conditional groups indicate the seriousness of this problem in terms of complexity in the diagnosis and therapeutic and preventive measures of diseases of the SOPR. Summarizing the data of the scientific literature, we can safely say that today the interest of practitioners and scientists has increased to the role of normal oral microbiocinosis and its disorders [14,20,40]. Dysbiosis of the oral cavity, as a risk factor for deepening the severity and deterioration of the prognosis of the course of the underlying pathological process and the development of complications of the course of the underlying disease, is a serious clinical problem and is the subject of this litobzor. In the literature, scientists use terms such as "dysbiosis", "microecology", "dysbiosis" and "microbiocenosis" [7]. To date, oral dysbiosis is considered to be a more competent and accurate term

reflecting the various manifestations of diseases of the oral cavity. Firstly, the normoflora is determined by the ratio of diverse populations of microorganisms of individual organs and systems that maintain the biochemical, metabolic and immunological balance necessary to preserve human health (Protocol of Patient Management, 2003). Secondly, microecology in pathological conditions represents qualitative and quantitative changes in various populations of bacteria, fungi, viruses, yeast, bacteroids, spore forms of microorganisms, etc. [5]. Researchers have noted that dysbiosis of the oral cavity, being a secondary pathology, exacerbates the severity and worsens the prognosis of the main process, and its successful elimination improves the results of treatment of the primary disease [23]. It is noteworthy that if timely and competently directed therapeutic and preventive measures to eliminate dysbiotic disorders in the oral cavity, it is possible to increase the effectiveness of treatment in general and reduce the risk of complications. In 1916, to denote changes in the microflora in the animal's body under the influence of various phenomena, A. Nissle introduced the concept of "dysbiosis". The analysis of foreign literary sources suggests that the term "dysbiosis" is not used. The "syndrome of excessive growth of intestinal microflora" (bacterial overgrowth) is found in English–language literature, and in German - "erroneous colonization of bacteria" (bacterielle Fehlbesiedlung) [9]. Dysbiosis (dysbiosis) of the oral cavity is a clinical and laboratory syndrome, which is characterized by changes in the quantity and quality of the dental normoflora and is torn due to disruption of adaptive capabilities, violations of protective and compensatory mechanisms. It is noted that dysbiosis is not an independent disease, this syndrome is always secondary and accompanies or complicates the underlying disease. Depending on the etiology, there are [4]: − dysbiosis in practically healthy people; occupational; age-related; seasonal; nutritive. − dysbacteriosis accompanying various diseases of the digestive system: stomach diseases occurring with hypo- and achlohydria, pancreatic diseases, liver and biliary tract diseases, intestinal diseases, malabsorption syndrome of any genesis; − dysbacteriosis in infectious, allergic, hypo- and vitamin deficiency, immunodeficiency conditions, hypoxia, endogenous

and exogenous intoxication, exposure to radionucleides; − drug dysbiosis – as a result of taking antibiotics, immunosuppressants, sulfonamides, tuberculostatics, antacids, laxatives and other drugs; − stress – with prolonged emotional or physical stress. The presented classification does not show quantitative characteristics of oral biocinosis. To date, despite the proposed systematization of dysbiosis based on changes in microbiocinosis according to the latest regulatory document of the industry standard "Protocol for the management of patients. Intestinal dysbiosis" OST 91.500.110004-2003, – there is no generally accepted classification that would fully satisfy both microbiologists and practitioners. According to scientific papers on the problem of intestinal dysbiosis, the authors present classifications by clinical forms [14]:

1.Compensated form. − latent or subclinical – absence of clinical signs, dysbiosis disorders are detected by examining the microbial spectrum of the intestinal flora.

2. The subcompensated form. − local or local – the development of a local inflammatory process in the intestine (clinical picture of colitis or enteritis).

3. Decompensated form. − generalized or widespread – generalization of dysbiosis due to a violation of functional barriers and a decrease in resistance of the macroorganism: with bacteremia, with generalization of infection and the type of microorganisms that caused dysbiosis [33]: bacteroid, staphylococcal, proteinaceous, candidamycosis, cloridiosis, cdebsiella, associated. It has been proven that the generalized form occurs more often in staphylococcal, candidamycosis and proteinaceous dysbiosis. Evolution has formed a rather complex relationship between the macro and the microorganism, manifested in multicomponence and inconsistency. On the one hand, microorganisms help synthesize vitamins, accelerate the digestion of food, participate in the positive modulation of the immune system, and are antagonists of pathogenic flora. On the other hand, microbes synthesize organic acids as one of the main causes of the carious process and inflammatory phenomena on the part of periodontal tissues in the oral cavity, and the ability to invade mediates the development of severe pathological conditions [3]. According to various

authors, there are about 100 to 300 species of microorganisms in the oral cavity, mainly aerobes that suppress the development of anaerobic microflora

On the one hand, the microflora of the oral cavity is characterized by relative constancy of qualitative and quantitative composition, even despite constant contact with the environment. On the other hand, the resident ecosystem of microflora depends on the physiological and pathological features of the macroorganism. Saliva is one of the main factors in the formation of the consistency of the microecology of the oral cavity. It should be noted that 1 ml of saliva contains up to 109 (from 43 million to 5.5 billion). bacteria with the highest content in the palatine tonsils and gingival pockets, in 1 ml of stomach contents reaches 105-1107 microbial cells, mainly tolerating a well-acidic environment and these indications are noted after eating. It should be noted that the oral cavity of a person with a fairly stable immune system contains resident microbiomaterial, which is under a fine balance between various biotopes in the oral cavity and the available immunophysiological background. The literature quite convincingly shows the division of the oral cavity, as an ecological niche, into such biotopes: the mucous membrane of the oral cavity, the ducts of the salivary glands with saliva in them, gingival fluid and the zone of the gingival groove, oral fluid, dental plaque. Qualitative and quantitative differences in the microecology of the above biotopes are provided by a set of physico-chemical features, namely, pH of the medium, viscosity, temperature, presence of organic compounds and food residues, partial pressure of gases. It is known that the oral mucosa is a fairly extensive biotope in terms of quantitative and qualitative diversity, and the microbial flora is quite variable in different parts of it [2]. There is also a relative constancy of the qualitative and quantitative composition of the normobiocenosis of the oral cavity, which is characterized by stability, as noted above, despite the constant influence of environmental factors. It should be noted that these possibilities, of course, are not endless. Scientists name many reasons that contribute to a change in the normoflora of the oral cavity (normal microecology). The analysis of the current state of this problem allowed us to identify the following provoking

factors: diseases of the gastrointestinal tract with the presence of secretory-motor disorders and inflammatory character affect the development of a secondary pathological reaction - dysbiosis, which subsequently negatively affects the course of the underlying disease, exacerbating the chronization of the process; transferred acute infectious diseases; malnutrition of fermentopathy; immunodeficiency conditions; psychological and physical stresses; professional factors, change of climatic and geographical conditions, etc. Reports from scientific papers show that the microbiocenosis of the oral cavity is sensitive to changes occurring in the external environment [8,6]. For example, in case of environmental violations, some researchers note a decrease in the microbiocenosis of the oral cavity of lactobacilli and the prevalence of staphylococci, fungi of the genus Candida, and the density of microbial populations increases. The result of the above is the negative effects of various types on the human body, as evidenced by a significant number of publications and scientific papers devoted to the problem of side effects from certain drugs. For many decades, scientists in their research have paid special attention to the effect of antibiotic therapy on changes in the immune status, manifested in weakening the resistance of the human body, suppression of normal microflora, provoking the development of various forms of candidiasis, local manifestations on the mucous membrane of the oral cavity [9]. The cause of dysbiotic changes is the negative effect of taking antibiotics for a long time, and many authors assign a certain role to such manifestations to broad-spectrum antimicrobials, emphasizing the adverse effect of a combination of antibiotics [5]. According to foreign authors, short-term general or local antibiotic therapy did not change the frequency of detection of mycobiota before and after treatment, therefore, fungi can cause disease only in the presence of some kind of somatic disease [12]. Clinical observations indicate that not all doses and concentrations of antibiotics contribute to the occurrence of candida infection. In the literature, there are reports of the development of dysbiosis from prolonged administration of high doses of corticosteroids, which, by reducing the phagocytic activity of white blood cells, damaging cells of the monocyte-

macrophage system and reducing the inflammatory response at the local level, having a proven immunosuppressive effect, increase the body's sensitivity to viral and infectious agents. Manifestations of a dysbiotic nature are confirmed by the detection of immune suppression in the treatment with cytostatics, manifested as a local manifestation of candidiasis stomatitis, and severe systemic forms of candidiasis with a 10% mortality rate [2]. Lesions of the immune system and blood diseases reflecting radiation sickness are often complicated by candidiasis infection not only of a local, but also of a generalized nature [8], which has also been proven in animal experiments [19]. A number of articles in detail show a quantitative increase in Candida fungi, pathogenic streptococci, staphylococci, and bacteroids in people who abuse smoking, and the quantitative prevalence of anaerobes over aerobes also increases [11]. Numerous studies show that the quantitative increase in Candida fungi increases with multiple carious lesions [16]. Easily fermentable carbohydrates are a key etiological factor in the occurrence of demineralizing and inflammatory processes in the oral cavity, including dysbiotic manifestations (candidiasis), and the predominant groups of microorganisms are obligate anaerobes. Scientists Pizzo G., Giuliana G. et al. suggested replacing ordinary sugar with xylitol or sorbitol, then Candida collonization decreases. Some authors draw attention to the fact that in children who consumed fluoridated salt, when examining the micropease of the oral cavity, Staph.aureus, fungi of the genus Candida were less often detected, and E.coli was not detected. It has been proved that the microecology of the oral mucosa is diverse, which determines the functional stability of the community, and streptococci and lactobacilli remain the most significant in the microbiocenosis of the SOPR [27]. It is noted that the index of species diversity reflects qualitative shifts in the ecosystem, if it is less than 1.71 lg CFU/h, then there is a violation of the constancy of the ecosystem. In this case, according to S.I. Sytin, homeostatic mechanisms lose the ability to return it to its original level, as the ecosystem is coming out of a controlled state. As dysbiotic phenomena appear, first there is a decrease, and with further development, the disappearance of beneficial microflora with a

corresponding decrease, and then the loss of its functions. At the same time, the ecological niche is freed and filled with pathogenic and conditionally pathogenic microorganisms. The latter adhere to the mucous membrane, proliferate, release toxins, penetrating into areas of the mucous membrane, provoke the development of bacterial contamination syndrome, characterized by a chain of pathological processes and dysbiotic manifestations [17]. Recently, the interest of practitioners and scientists has increased in the influence of dental orthopedic structures on the microecology of the oral cavity, the work indicates its dynamic change. Restoration of dental defects and dentition in modern orthopedic dentistry becomes necessary, taking into account the complex effect of orthopedic structures on both tissues and organs of the oral cavity and the body as a whole. The positive result (success and quality) in the clinic of orthopedic dentistry is influenced not only by the correctly executed design of the denture, according to the individual characteristics of the dental system of the patient, but also by the minimization of local and general complications from orthopedic treatment, in the occurrence of the latter, the properties of the main materials used in their manufacture play a special role. It is known that manufactured therapeutic and preventive dentures have a very diverse effect on the tissues and organs of the dental system with appropriate body responses [6,16]. The properties of structural materials, methods of fixation of orthopedic structures, the nature of the transfer of chewing pressure and much more, depending on the type of orthopedic structure used, determine the pathogenetic mechanism of reactions from the tissues of the prosthetic bed [12]. The latter, in turn, are influenced by such indicators as the reactivity of the body itself, as well as the nature, duration and intensity of the stimulus. In dental practice, various structural materials are used in the manufacture of orthopedic structures, with certain positive and negative characteristics. Of course, applied science (materials science) is not worth it, basic and auxiliary materials are constantly being improved in terms of technological and clinical properties, new materials with the required characteristics are being created. Modern dental materials are subject to high technological, aesthetic, physico-mechanical, chemical,

toxicological and hygienic requirements. Today, a big question remains open, despite all the achievements of materials science and the literacy of clinical and laboratory orthopedic treatment in relation to the individual response, both from the tissues and organs of the dental system and the whole body as a whole to the manufactured denture. The negative effect on the mucous membrane of the oral cavity and the body of the "prosthetic carrier" is manifested in a complex of pathological changes described in the special literature as "intolerance to dental structural materials". The polyethologicity and complexity of the bioprocesses of this symptom complex indicates the seriousness of this problem in terms of the effectiveness of all orthopedic treatment and the quality of life of the patient [13].

The review of sources of domestic and foreign literature on the subject of etiology and pathogenesis, systematization of types of dysbiosis (dysbiosis), features of the manifestation of dysbiosis in the oral cavity, allows us to conclude that the appearance of changes in the oral mucosa of a dysbiotic nature, including candidiasis, is seriously affected by the general condition of the human body. The syndrome of "dysbiosis of the oral cavity" studied by us accompanies or complicates not only the course of certain somatic diseases, the causes can be both endogenous and exogenous factors. Some authors consider dysbiosis from the point of view of pathogenesis as a "secondary syndrome", others as a disease of the "end of any previous somatic disease". Undoubtedly, the need for further study of the problem of dysbiosis of the oral cavity in modern orthopedic practice and the search for new methods of therapeutic and preventive measures to eliminate dysbiotic disorders caused by dental structural materials remains relevant today.

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