



Immunological Aspects of the Use of Bridges in Dentistry

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Abstract: this article is devoted to the study of the etiology, pathogenesis, clinic, diagnosis, treatment of chronic pancreatitis.

Key words: proliferative fibrosis, chronic indurative pancreatitis, persistent inflammation, purulent or necrotic masses, pancreatic amylase, lipase.

Relevance. Studying the relationship between the immune system and dental materials reveals new aspects of their impact on human health. An important role in this is played by the subsystem of immune protection, including intraepithelial protection provided by the oral mucosa. The effectiveness of this protection depends on several key parameters: the thickness of the epithelial layer, the density of intercellular junctions and the resistance of the keratin layer. The interaction of prosthetic materials with these elements can provoke an immune response that ranges from mild intolerance to severe reactions. Such data helps science better understand how to minimize the negative effects of dental materials on the body. The study of the interaction of the immune system and dental materials reveals the complex mechanisms of the body's response to artificial substances used in dentures. Within the framework of the immune defense of the human body, several subsystems function, including local protection of tissues and organs, which includes subsystems associated with the skin, intraepithelial and neural tissue [2.4.6.8.10.12.14.16.18].

The maturation of epithelial cells is regulated by specific humoral factors secreted by the cells of the connective tissue that is located under the epithelium. Modern research has identified more than 20 different cytokines involved in this process. Each stage of epithelial cell development is associated with a unique set and concentration of cytokines, which allows them to be used as biomarkers to determine the stages of cell differentiation. The barrier function of the epithelial layer (EP) is maintained through a continuous renewal process that includes the replacement and removal of external cells, as well as the microorganisms on them. The time required for a complete EP update can be significantly reduced under the influence of various stimuli and in conditions of certain pathologies. The processes of proliferation and differentiation of epithelial cells are controlled by a complex of biologically active compounds. Among them, cytokines play a special role, including epidermal growth factor (EGF), which is found in large quantities in saliva, as well as interleukins 1 and 6 and TGF- α , which together regulate these vital processes of tissue renewal. [1.3.5.7.9.11.13.16.17.19].

In the basic state, without external stimuli, epithelial cells (EC) perform protective and secretory functions without showing signs of immunocompetent cells. However, even at rest, ECs have receptors for cytokines such as IFN- γ , IL-4, and IL-17, suggesting their potential involvement in immune responses. In the presence of mechanical or chemical influences, as well as under the influence of microbial activity products, EC activation occurs. As a result of activation, ECs begin to exhibit the characteristics of immunocompetent cells: they produce cytokines and participate in antigen presentation. Activated ECs secrete a set of cytokines that resembles those produced by macrophages, including IL-1, TNF, IL-6, and IFN- α , which often leads to inflammation. This immune response is enhanced by the production of hematopoietic cells that stimulate the growth of neutrophils and monocytes, which affect both hematopoietic cells and the EC itself. In addition, ECs



are capable of secreting IL-12, 15, 16, 17, 18 and chemokines, which attract T-lymphocytes and dendritic cell precursors to the skin and mucous membranes.

In the mucous membranes, there is a category of epithelial cells specialized for participating in immune reactions — M cells. These cells are located above Peyer's plaques and lymphatic follicles, performing the function of transporting antigens from the intestinal lumen or bronchi to lymphoid structures. Interacting with macrophages, dendritic cells, and lymphocytes, M cells are actively involved in capturing antigens through endocytosis and their subsequent transfer to the basal part for exocytosis. Thus, antigens are presented to T-lymphocytes in specialized antigen-presenting cells. M cells also produce a number of important cytokines, such as IL-2, IL-5, IL-6, and IL-10, as well as IL-1 and TNF-alpha, which help attract and activate other immune cells. In addition, they secrete defensins that provide antimicrobial protection and promote epithelial repair. When M cells are activated, increased production of these cytokines occurs. They also produce chemokines that attract T-lymphocytes and dendritic cells to the mucous membranes, thus ensuring dynamic participation in immune defense. The local immune system of the oral cavity, consisting of the mucous membrane, saliva and gum fluid, ensures the maintenance of a structural balance of tissues. In studies of local immunity in dental patients, saliva is often used as the main object of analysis, using markers such as CD3, CD4, CD8, CD19. The importance of local immune responses in the oral cavity lies in the possibility of uncovering the mechanisms of action of prosthetic materials on tissues. Changes in immunological homeostasis can manifest themselves through various pathways: changes in lymphocyte subpopulations, a decrease in the immunoregulatory coefficient, and an increase in the number of cytolytic cells. Such changes lead to fluctuations in the number of killer T-lymphocytes and the level of DNA cells in the blood. Saliva contains Class A immunoglobulins, which protect the oral mucosa. The increased IgA content in saliva demonstrates the importance of these immunoglobulins in stimulating protective mechanisms in the oral cavity. In patients with partial tooth loss who do not use dentures, fluctuations in IgA levels from 220 mg/l to 150 mg/l are observed, the phagocytic activity of neutrophils varies from 13.2% to 9.4%, and the number of neutrophils varies from 48.5% to 39.6%. These indicators, compared with healthy people, show a decrease in the activity of the immune system. In the early stages of the development of inflammatory diseases affecting the periodontal structure, such elements as the presence of gaps between teeth, the possibilities of recovery that arise as a result of orthopedic therapy, and the depth of the gap between the tooth and gum play a fundamental role. The appearance of pathological pockets in the gums occurs due to the adhesion of epithelial bonds to the molecular levels on the enamel. The effect of different types of dentures on lysozyme concentration in mixed saliva is different. In the first few days after the prostheses are installed, this indicator usually decreases. However, after three to four weeks of use, the data changes: in patients with bridges, the lysozyme concentration increases and significantly exceeds the initial levels; in users of complete removable dentures, it remains unchanged; in those who use partial removable dentures, the indicator is lower than the initial one. This decrease in lysozyme may contribute to a more active proliferation of bacteria in the oral cavity, which is especially typical for older age groups who have a decrease in the immune activity of the oral cavity.

Information about the content of lysozyme and sIgA in the saliva of patients with intolerance to dental materials (NSM) is controversial among researchers. On the one hand, there is an increase in lysozyme and sIgA levels, which is interpreted as a protective reaction of the body at the local level. On the other hand, in patients with NSM, a decrease in these components in serum and saliva is recorded, indicating suppression of the general resistance of the body. In addition, in patients exhibiting an allergic reaction to metal alloys, the local humoral part of the immune system is activated in response to antigenic stimulation. This is confirmed by high levels of sIgA, IgA and IgG in saliva, which indicates a clear immune response. Studies show that patients with allergies to the components of acrylic and polymer dentures often have decreased levels of immunoglobulins IgA, IgM and IgG in the blood, indicating a weakening of immune defenses. At the same time, in such patients, the activity of circulating immune complexes increases and there is a decrease in



complement function, which reflects the suppression of immunity and a possible deterioration in the general condition. In addition, patients who are allergic to metal components of dentures experience activation of biochemical pathways such as glycolysis and lipoperoxidation, which can lead to structural changes in periodontitis.

Conclusion. These changes include increased tissue permeability and activation of the immune system, manifested through morphological changes such as mast cell degranulation and the formation of lymphoplasmocyte infiltrates, which is considered a sign of an allergic reaction to prosthetic materials. Thus, an analysis of the literature confirms that the choice of materials for dentures is critical to ensure both functionality and biocompatibility with the patient's body. A study of existing prosthetic materials shows differences in their effects on the immune system: some materials enhance immune defenses, while others can suppress immune responses or cause allergic responses. In this context, it becomes obvious that careful examination and comparison of materials is necessary to identify the safest and most effective prosthetics options.

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