

CLINICAL-FUNCTIONAL EXAMINATION METHODS IN THE ORGANS OF THE ORAL CAVITY WHEN PROSTHETICS WITH BRIDGING PROSTHESES MADE OF ZIRCONIUM AND METALLOCERAMICS

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The development of modern dentistry allows not only to create materials that, due to aesthetic and functional characteristics, approach the tissues of natural teeth, but also to study the positive and negative reactions of patients who use prostheses [A.C. Vabikov, 2007; S.I. Gajva, 2010]. A large number of studies on the pathology of the hard tissues of the teeth and the rows of teeth are the basis for the study of the problem of Dental Materials Science [S.N. Garage, 2010; I.S. Redinov, 2010; L.D. Gojaya, 2011]. The mucous membrane of the oral cavity undergoes high antigen pressure. First of all, keratinocytes are found to harmful effects, and the degree of resistance of the body to traumatic agents depends on their functional lability. However, at present there are practically no data on the cell composition of epithelial plaques of the mucous membrane of the prosthesis relay, as well as on the immune control in this process under the conditions of prosthetics (Y. Kimura et al., 2012).

Among dental diseases, diseases occupy a special place. They remain one of the pressing problems of therapeutic dentistry. In recent times, there has been an increase in the number of inflammatory diseases. This is due to both an increase in the number of harmful factors affecting the body and a decrease in the standard of living in the population. The severity and prevalence of diseases are based on the nature of the etiological factor as well as the intensity of aggression [ya.A. Lavrovskaya, 2015].

According to various authors, the prevalence of ODSHQ diseases ranges from 3 to 20%. In recent years, more and more studies have been carried out on diseases around the world, in different groups of the population using metalloceramic and zirconium prostheses [A.V. Mikhilchenko and hammual., 2016].

The treatment of diseases and the Prevention of their recurrence causes great difficulties and is less effective in most cases. Pathogenetic approaches should be used to prevent relapses, which are based on an in-depth knowledge of the mechanisms of development of pathological processes [ya.A. Lavrovskaya, 2015]. The chemo role of the mucous membrane is also realized through local immune mechanisms, therefore, the study of intercellular interactions and the role of immunocompetent cells associated with the mucous membrane of the oral cavity is a separate urgent issue for practical dentistry (A. Base et hand., 2012; X. Wu et al., 2012).

The study of RV (saliva) is a valuable non-invasive method for assessing the general condition of the body and, in particular, the organs of the oral cavity. Collecting RYE (saliva) is convenient and simple, it is painless, the risk of infection of medical personnel is significantly less than when working with blood, and the content of certain substances in saliva (for example, hormones, antibodies, drugs, etc.) reflects their concentration in the blood. Modern technologies for the study of proteins in biological media make it possible to determine the levels of various immune indicators and their biological activity in RYE (saliva) and other secretions containing the studied proteins in minimal concentrations [1.3.5.7.9.11.13.15.17].

In connection with the above, it was of interest to study the state of humoral immunity parameters, as well as cytokine status, which were determined in the oral fluid of patients.

The study of the local immune status can expand the understanding of the state of the oral cavity after prosthetics, as well as provide an opportunity to review and use the data obtained for additional correction of orthopedic treatment.

Immunoglobulins are protective proteins of blood serum or secretions that have the function of antibodies and belong to the globulin fraction.

The leading role in the system of local immunity of the mucous membranes is assigned to secretory IgA (sIgA), the main source of which is the parotid glands. sIgA is formed by the interaction of plasma cells synthesizing IgA and the secretory component, the synthesis of which is carried out by epithelial cells of the ducts of the salivary glands.

Secretory antibodies of the oral fluid are immunoglobulins of the IgA and IgM classes and are of local origin. They are produced by plasma cells located under the basement membrane in the connective tissue layer of the mucous membrane - in its own plate.

Analysis of the obtained data revealed that the content of immunoglobulins of all classes before treatment in patients in need of prosthetics were close to the indicators of control values. Thus, the sIgA level in the main group averaged 825 ± 8.80 mg/ml when in the comparison group its concentration was 780 ± 8.59 mg/ml ($P < 0.001$). The IgM concentration exceeded the values of the control group by 1.2 times (82 ± 2.71 mg/ml vs. 68 ± 1.31 , $P < 0.001$), as well as the IgG content differed from the control group by 1.5 times (56 ± 1.11 mg/ml vs. 37 ± 1.13 mg/ml, $P < 0.01$)

Therefore, in the absence of pronounced inflammatory processes in the oral cavity (periodontal disease of various degrees, gingivitis, stomatitis, etc.), the obtained indicators are absolutely appropriate.

The development of inflammatory diseases is determined by the state of cytokine regulation. Most of both pro- and anti-inflammatory cytokines are present not only in peripheral blood, but also in other body fluids [2.4.6.8.10.12.14.16.18]. The sources of their production are both lymphocytes and macrophages embedded in the epithelium of the mucous membranes, as well as epithelial cells of the mucous membranes and the salivary glands themselves. Another source of cytokines in RV (saliva) may be their transudation from blood serum. However, many researchers have noted that the content of cytokines in RYE (saliva) does not correlate with their level in the blood, which indirectly indicates their local synthesis.

IL-1 (α and β) (IL-1) Producing cells are monocytes, macrophages, dendritic cells, endothelial cells, etc. Its active production is observed in inflammatory processes, tissue lesions. IL-1 participates in almost all stages of the immune response, promotes the activation of cells in the focus of inflammation, enhances the production of other cytokines, as well as prostaglandins, collagen and fibronectin synthesis, stimulates phagocytosis, generation of superoxide radicals, and causes degranulation of mast cells.

The immunological role of IL-1 β is to trigger the first stages of the immune response, involving certain T-lymphocytes – T-helpers in the process. It stimulates the transformation of B-lymphocytes into plasma cells, accelerates the formation of antibodies. The inflammatory role of IL-1 β is manifested by an increase in neutrophil motility, stimulation of cell activity in the focus of inflammation, and increased activity of other cytokines [21.23.25].

Cytokine is a powerful stimulator of the production of proteins of the acute phase of inflammation by liver cells. This proinflammatory cytokine is able to enhance the proliferation of endothelial cells. After meeting with the antigen, specialized cells initially secrete IL-1 β and TNF- α , and only then IL-6.

The data obtained indicate that the concentration of IL-6 in the general group of patients before the start of orthopedic treatment exceeded the values of the control group by more than 1.3 times (14.7 ± 0.46 pg/ml versus 11.8 ± 0.55 , pg/ml, $P < 0.001$), which indicates an already formed inflammatory focus in the oral cavity (Fig.4.2).

The next stage was to study the synthesis of tumor necrosis factor α (TNF- α), which is a product of monocytes, macrophages, endothelial basophils, mast and myeloid cells, neuroglia cells and has a wide spectrum of biological action. This cytokine plays a role in the development of an inflammatory response: it initiates the synthesis of interleukin-1, interleukin-6, and also stimulates the proliferation of T- and B-lymphocytes [18.20.22.24.25].

As a rule, the content of TNF- α is not determined, or is at a low level in the blood serum of healthy donors, whereas with the development of the pathological process, its amount increases several times.

Thus, the synthesis of TNF- α in patients in the general group before prosthetics averaged 12.3 pg/ml, when in the control group these values were equal to 9.4 pg/ml, which is 1.3 times more ($P < 0.001$).

In this study, the level of the important anti-inflammatory cytokine IL-10 in rye was studied. The main effect of IL-10 is anti-inflammatory. It is realized through the suppression of the activity of macrophages and T-lymphocytes, and also suppresses the production of all pro-inflammatory cytokines, interferon, and the proliferative response of T cells to antigens and mitogens [13.14]. Acting as a Th2-cytokine and due to the ability to suppress cytokine production in monocytes and Th1-lymphocytes and inhibit the antigen presenting ability of monocytes, IL-10 inhibits the cellular immune response, stimulating at the same time the proliferation of B-lymphocytes and humoral immune response [18].

When analyzing the data obtained as a result of the study, a significant increase in the level of IL-10 in the main observation group before orthopedic treatment was found to be 1.2 times (10.6 pg/ml versus 8.5 pg/ml) ($P < 0.01$).

The above data of our study indicate the receipt of a large number of serum antibodies to the site of inflammation, which in this case is a biologically appropriate mechanism for enhancing local immunity. However, due to the fact that IgM normally practically does not enter saliva, in particular RV, in the case of an increase in the level of IdM in patients with metal-ceramic fixed prostheses, there appears to be ulceration of the oral mucosa and massive transudation of immunoglobulins of this class from the blood, which is confirmed by examination the very next day. Ulceration after a week of establishing the structure was represented by defects of the mucous membrane within the epithelium with smooth edges. The bottom of the traumatic lesions was moist, located just below the surrounding mucosal tissues.

Thus, based on the conducted studies, it can be stated that the established cytokine imbalance in the RV indicates an increase in the antigenic load and increased permeability of the oral mucosa as a result of the traumatic genesis of the prosthetic bed and as a consequence of the developed inflammatory process.

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