

COMPARANCE SPECIFICS OF LACTOFERRIN IN SALIVA SECRETION OF PATIENTS WITH VIRAL AND BACTERIAL DISEASES IN ORAL CAVITY

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Annotation. The oral lactoferrin is one of the important components of the secretory immune system. The comparative analysis of lactoferrin concentration in oral liquid of patients with an exacerbation of viral herpetic infection and bacterial periodontal infection of oral cavity is provided. The dependence of lactoferrin secretion of oral liquid from the etiology of the disease in oral cavity is revealed. The most expressed increase of lactoferrin concentration in oral liquid is proved for acute or locally persistent periodontitis of the bacterial nature.

Keywords: *lactoferrin, oral liquid, periodontitis, oral herpes*

Abstract

One of the most important indicators of secretory immunity is the protein lactoferrin (LF). Lactoferrin (known as lactotransferrin) is a non-heme iron-binding glycoprotein belonging to the family of transferrin [1]. Its main function is the regulation of iron metabolism. LF delivers Fe²⁺ ions to the cells of the reticuloendothelial system (macrophages), where they are deposited in the form of ferritin by conversion to Fe³⁺. Ferritin is the main storage protein of iron in the body (inactive depot). The use of its reserves occurs with hypoferremia, which is observed during inflammation. The passage into the “ferritin pool” results in the concentration of lactoferrin in the oral fluid.

References on the content of LF in blood, oral fluid and other biological fluids, both in norm and in pathological processes, are widely represented in modern sources, but are quite contradictory [1—3, 5, 6]. Laboratory research of oral fluid is one of the most common non-invasive methods of diagnosis, monitoring, evaluation of the quality of treatment of various diseases. One of the most important functions of oral fluid is the protective one, which is carried out due to the proteins contained in it (immunoglobulins, defensins, lysozyme, lactoferrin, mucin, inhibitors of proteolytic enzymes, growth factors and other glycoproteins) [1, 2]. Components of saliva affect the processes of inflammation and regeneration of the mucous membrane of the mouth, take part in maintaining the immunity of not only the oral cavity, but the whole organism as a whole [3]. The oral fluid plays an important role in the diagnosis of oral diseases. The composition and properties of oral fluid is influenced by the hygienic state of the oral cavity, the presence of dental and somatic pathology. Quantitative changes in the content of various components of saliva may indicate a qualitative deterioration of the oral cavity, are a significant criterion for diagnosing common dental diseases [4]. The majority of multifactorial dental diseases can be considered immune dependent, so the definition of immunoactive molecules, including lactoferrin, becomes relevant, simple enough, clinically expedient and pathogenetically significant diagnostic method for diseases of a viral and bacterial nature that often accompany one another [1—3, 5, 6]. Despite the large number of publications in the field of diagnostics of diseases, the regularities of secretion of lactoferrin remain insufficiently studied depending on the nature of the disease of the oral cavity.

Purpose of the study is to identify the patterns between the amount of lactoferrin in the oral fluid in viral and bacterial immune-dependent dental diseases.

Materials and methods of research

The study presents the analysis of the oral fluid composition of patients who are under the supervision of the Sementsova E. A. — assistant of the Department of Propaedeutics and Physiotherapy of Dental Diseases of the Ural State Medical University. The study was conducted in 67 patients with viral diseases of the maxillofacial region (chronic recurrent herpetic cheilitis or stomatitis) and concomitant chronic generalized periodontitis. Patients were at the age of 30—50 years (mean age 45.3 years) living in the city of Yekaterinburg. In this case, all patients are carriers of both diseases. Depending on the presence of an exacerbation of the disease all patients were divided into 2 groups: 1) study group number 1—34 patients with exacerbation of chronic recurrent herpetic cheilitis or stomatitis; 2) study group number 2—33 patients with the diagnosis: exacerbation of chronic generalized periodontitis of mild or moderate severity. To confirm the viral etiology of the disease, the DNA of the herpes simplex virus (HSV) of types I and II was determined by PCR using the complex of equipment and diagnostics “DNA technology” (Russia). The titre of specific antibodies in the blood was detected by immunochemiluminescent analysis (ARCHITECT 2000, Abbot, Germany).

Diagnosis: chronic generalized periodontitis of mild or moderate severity was delivered in accordance with the clinical recommendations of the Stomatological Association of Russia, 2014. The control group consisted of 30 somatically preserved patients of the same age who had no history of herpetic infection in the maxillofacial area and exacer-

bations of chronic generalized periodontitis. Patients of all study groups underwent complex dental examination (basic and additional methods), after which they received a spontaneous oral fluid.

The investigations were performed by the method of solid-phase heterogeneous immunoenzymatic analysis performed on the basis of the Central Research Laboratory of the USMU. Immunoenzyme analysis (ELISA, ELISA test) allowed the detection of antigens (antibodies) with the help of appropriate antibodies (antigens) conjugated with the enzyme-label. In solid-phase ELISA, one of their specific reagents is immobilized on a solid carrier.

Study results and discussion:

The results of LF determination in the oral fluid of patients are presented in table 1.

Table 1

LF (ng/l) content in oral fluid of patients

Options	Exacerbation of periodontitis	Exacerbation of herpetic infection	Control group
LF, ng/l	61882,35±9283,48	14294,12±3818,13	7565,30±1006,00
p ₁	p ₁ ≤0,05	p ₁ ≤0,05	p ₁ ≤0,05
p ₂	p ₂ ≤0,01	p ₂ ≤0,01	

p₁ — in comparing with the control group

p₂ — in comparing groups with each other

The median value for this indicator in the control group correlates with the literature data in healthy adults — from 1000 to 8000 ng/ml according to the results of previous studies in the city of Yekaterinburg [2]. Our study showed an increase in the concentration of LF in both study groups (p₁≤0.05). With exacerbation of periodontitis, LF concentration was significantly higher (4.3 times) than with exacerbation of HSV and CMV (p₂≤0.01) [7]. This result explain by the fact that exacerbation of periodontitis, as well as of other bacterial diseases, is accompanied by suppuration, which leads to an increase in the content of neutrophilic granulocytes, which are also sources of lactoferrin. It should be taken into account that the increase in the level of LF in inflammation is due not only to an increase in the number of neutrophils, but also to their intensive degranulation, which occurs due to cell hyperactivation by substances of bacterial origin, complement components and their fragments, and pro-inflammatory cytokines [3]. The findings connected with similar studies in other areas of medicine, for example, in neurology — with inflammation of the meninges [5]. This indicates that the concentration of LF can serve as an indicator of the severity and severity of inflammatory reactions not only in the oral cavity, but also in the entire body [8].

The results of the study showed a marked violation of secretory immunity (by LF level) in patients with exacerbation of viral and bacterial dental diseases. The determination of the content of LF in oral liquid is useful for assessing the state of secretory immunity of the oral cavity in patients with herpesvirus infection and periodontal diseases.

Conclusions:

1. Lactoferrin can serve as a marker of exacerbation of inflammatory dental diseases.
2. The tendency of a significant increase of LF in exacerbation of chronic generalized periodontitis was revealed.
3. Differences in the content of lactoferrin in the oral liquid have been established in the exacerbation of dental diseases of a viral and bacterial nature.

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