INTEGRATED LEUKOCYTE INDICES IN THE ORAL LIQUID OF PATIENTS WITH PARTIAL SECONDARY ADENTIA

Hyun D. N.

Tashkent Institute for Advanced Medical Studies

ABSTRACT

The oral cavity is a complex biological environment, characterized by a variety of processes, which are based on electrochemical phenomena that occur in its tissues and at the border of tissues with oral fluid [1; five;].

It is known that as a result of corrosion or in the presence of defects (chips, etc.), the metal structures of dentures located in the mouth, in contact with saliva, lose their basic properties - Their strength, ductility and other qualities decrease. Metal oxides appear in the oral cavity, which adversely affect the CRR and the patient's body [7].

Today, in orthopedic dentistry, a wide range of materials is used in the manufacture of dentures. These include stainless steel, KHS, porcelain, plastics, and combinations thereof. The choice of material used in prosthetics of the patient is determined by the doctor depending on the planned design of the denture.

Objective manifestations of intolerance to metal inclusions can be very diverse. A definite connection was noted between metal dentures and various pathological conditions of the mucous membrane [3; 6; 8;]. Along with complications in the oral cavity, pathological processes can be noted in other organs and systems.

The study of integral leukocyte indices allows us to assess the state of nonspecific reactivity of the body, as well as the intensity and nature of the inflammatory process [2; 4;]. Moreover, the method has the following advantages: simplicity of mathematical calculations, low cost, speed of research, and this analysis can be performed by any hospital laboratory [2].

The aim of our study was to evaluate the features of changes in integral leukocyte indices in patients with partial secondary adentia after dental prosthetics.

Material and research methods

We examined 27 patients with partial secondary adentia on outpatient treatment. Of these, 15 were women (55.5%), 12 - men (44.4%). The average age of patients was 44.3 + 0.69 years. For all patients, the replacement of defects in the dentition with bridge dentures was performed.

Along with dental research, we used a number of integral mathematical indices to assess the level of endogenous intoxication (EI) [4]. Before and after prosthetics, mixed saliva of 2-3 drops was collected on a glass slide to determine the leukogram and integral mathematical indices.

Based on the analysis of oral fluid indices, the following integral indices were determined: leukocyte intoxication index (LII) of Kalf-Kalif, characterizing the severity of EI; leukocyte index (LI), reflecting the relationship of the humoral and cellular parts of the immune system; leukocyte shift index (LIS), the increase of which indicates an active inflammatory process and a violation of immunological reactivity; lymphocytic granulocyte index (ILH), which allows to differentiate auto- and infectious intoxication; neutrophil to lymphocyte ratio index (LISL), which reflects the ratio of nonspecific and specific defense cells; index of the ratio of neutrophils and monocytes (ISNM), by its change it is possible to judge the ratio of the components of the microphage-macrophage system; the ratio of lymphocytes and monocytes (LISM), which reflects the ratio of lymphocytes and editor links of the immunological process; index of the ratio of lymphocytes and eosinophils (ISLE), roughly reflecting the ratio of the processes of hypersensitivity of the immediate and delayed type. Calculation of coefficients reflecting local immunity.

To assess the course of the pathological process, we conducted a cytological study with verification of the content cells in mixed saliva: epithelial cells, neutrophilic and eosinophilic leukocytes, monocytes, lymphocytes, etc. Based on the analysis of mixed saliva, coefficients reflecting local immunity were calculated (Shapiro N.A., 1991; Emanuel V.L., 1997) [171,180].

To neut / epit, the ratio of the percentage of neutrophilic leukocytes to the percentage of other cells: lymphocytes, basophils, mast cells, epithelial cells, etc., reflects the degree of inflammatory reaction.

To eos / epit - the ratio of the percentage of eosinophilic leukocytes to the percentage of other migrating cells - epithelial cells, indirectly indicates the severity of the humoral link of inflammatory reactions. To neut / eoz - the ratio of the percentage of neutrophilic and eosinophilic leukocytes is an indirect indicator of allergization.

Statistical processing of data was carried out on a personal computer using programs developed in the EXCEL package using a library of statistical functions. The significance of differences in parameter values was determined by t-student criteria.

Results and its discussion.

Numerous experimental and clinical studies have established the relationship between the rheological properties of blood and saliva. Short-term and minor changes in the cellular composition of mixed saliva are caused by a peculiar pathological condition in the oral cavity, which can affect the trophism of the mucosa, its protective system, the degree of regeneration, and thereby indicate ways of correcting this condition [2; 4;].

The analysis of the integral indices of the content cells in mixed saliva in individuals using fixed prostheses at different times after prosthetics showed the different directions of the studied saliva indices.

An analysis of the results showed that in the mixed saliva prior to prosthetics, the examined individuals showed an increase in the proportion of the number of epithelial cells and eosinophils. The increase in the content of epithelial cells is apparently due to increased apoptosis or necrosis of the oral mucosa due to changes in the rheological properties of saliva, mechanical damage and changes in the number of functionally active cellular organelles found in healthy individuals with preserved dentition. Along with class a secretory immunoglobulin, an increase in the number of eosinophils is a natural reaction of the oral defense system.

In the early days, after prosthetics with fixed prostheses made of stainless steel, the studied pattern in mixed saliva changes. Its characteristic feature is the activation of a local inflammatory reaction, which gradually decreases by day 28.

An increase in the allergic background due to an increase in the level of eosinophils also decreases by the end of the month.

When replacing defects in the dentition, with ceramic-metal prostheses, we observe a similar dynamics, but this contingent of examined persons has an increase in the allergic background due to an increase in the level of eosinophils.

Thus, it can be argued that cermet dentures do not cause allergies and do not deplete the immuneprotective system of the oral mucosa. In subjects under study, prior to prosthetics, activation of apoptotic or necrotic processes of the mucosa is observed, leading to the release of peptides of various molecular weights into the oral cavity, which leads to an increase in the level of peptides of medium molecular weight. This condition leads to a shift in the pH of saliva to the acid side, apparently due to the activation of the enzyme systems of lysosomes, mainly acid phosphatase.

The results of the calculation of integral hematological indices for each group before, after prosthetics and at different periods of use of dentures are presented in table 1.

The analysis of changes in the integral indices of the examined individuals before prosthetics showed statistically significant differences compared with the control indices in all calculated indices, except for ISLE. In the above 7 calculated indicators, multidirectional statistically significant changes were observed. At the same time, there was a violation of immunological reactivity, an increase in the activity of the microphage system.

On the first day of using dentures, the examined individuals showed an increase in the integral indicators of oral fluid to the maximum values when applying dentures (LII, ISL, ISNL, ISNM. According to the literature, an increase in LII corresponds to an increase in the level of endogenous intoxication and activation of tissue decay processes. Increase in LII associated with a decrease in the number of eosinophils, an increase in the number of segmented forms of leukocytes and a decrease in the number of lymphocytes and monocytes. In this situation, an increase in the erythrocyte sedimentation rate is also observed.

From the first day of using dentures, an increase in the activity of the macrophage system is observed, expressed in an increase in the number of monocytes and eosinophils (ISNM, ISLM, ISLE).

An increase in the number of eosinophils with a detoxification functional orientation, as well as lymphocytes and monocytes, is considered as a sign of activation of the immune system.

Index	Control	Before	Terms of use of dentures		
	n = 15	prosthetics			
		n = 30	1 день	14 дней	28 дней
LII	0,89±0,07	1,24±0,11*	2,19±0,29*	1,64±0,19*	0,85±0,06
LEE	0,56±0,06	0,38±0,04*	0,21±0,03*^	0,35±0,04*	0,64±0,07^
LIS	1,78±0,13	2,45±0,34	4,88±0,56*^	2,7±0,31*	1,63±0,27
ILG	5,47±0,27	3,66±0,34*	1,93±0,27*^	3,29±0,44*	5,97±0,61^
ISNL	1,8±0,16	2,7±0,13*	5,13±0,47*^	2,92±0,23*	1,6±0,11^
ISNM	63,0±5,8	23,3±1,21*	82,0±7,2*^	23,3±1,33*	59,0±4,7^
ISLM	35,0±2,4	8,7±0,71*	16,0±0,87*^	8,0±0,78*	37,0±3,4^
ISLE	35,0±2,6	26,0±1,8*	16,0± 1,2*^	8,0±0,78*^	12,3±0,78*^

Table 1. Integrated leukocyte indices in patients before and after prosthetics

Note: * - significance of differences (P <0.05) when compared with control; ^ - significance of differences (P <0.05) when comparing groups before and after prosthetics.

By changing the ISNM, the ratio of the components of the microphage-macrophage system can be estimated. Neutrophilic granulocytes are key effectors of the systemic inflammatory response syndrome. A decrease in ISNM on day 14 after prosthetics may indicate the activation of a specific protection system.

A statistically significant increase in ISNM may indicate activation of a non-specific inflammatory process.

According to the literature, ISLE roughly reflects the ratio of immediate and delayed hypersensitivity processes. Due to its significant decrease on the 14th day of the study when

Special Issue on Basis of Applied Sciences and Its Development in the Contemporary World Published in Association with Department of Technology and Organization of Construction, Samarkand State Architectural and Civil Engineering Institute, Uzbekistan Department of Mechanization of livestock, Samarkand Institute of Veterinary Medicine, Uzbekistan Novateur Publication India's International Journal of Innovations in Engineering Research and Technology [IJIERT] ISSN: 2394-3696, Website: www.ijiert.org, 6th August, 2020

applying stainless steel prostheses, we can conclude that in this case there is a violation of immunological reactivity, accompanied by a predominance of immediate-type hypersensitivity processes, whereas on the first day it was 3.5 times above, which indicated the result of hyperhistaminemia.

According to the data obtained, with prosthetics on the 28th day of use, the average values of leukocyte indices, with the exception of LII, ISNM, ISLE, approach the values corresponding to the control indices. The examined individuals showed a significant decrease in the following leukocyte indicators of oral fluid: LII - 2.7 times, ISNM - 1.3 times, ISLE - 3.4 times compared with the control indicators (Table 1).

Thus, the analysis of quantitative and qualitative changes in the indicators of mixed saliva allows us to assess the level of endogenous intoxication, as well as the state of the immune system and the degree of their compensation in people using dentures. After prosthetics, there is a decrease in endogenous intoxication of the body, the severity of the inflammatory process, changes in the ratio of migrating cells in the oral cavity, a decrease in the allergy index, and an improvement in the hygienic condition of the tissues of the oral cavity.

Bibliography

1. Mikhalchenko D.V., Mikhalchenko A.V., Poroshin A.V. The modified methodology for assessing adaptation to orthopedic dental constructions // Basic Research. 2013. -№3 (part 2). -C. 342-345.

2. Raznatovskaya E.N. Integral indices of endogenous intoxication in patients with chemoresistant pulmonary tuberculosis // Practical medicine. 2012. No. 5. –S.119-120.

3. A method for diagnosing intolerance to orthopedic structures in the oral cavity / T. F. Danilina, D. V. Mikhalchenko, A. V. Zhidovinov [et al.] // Modern high technology. - 2013.
- No. 1. - S. 46–48.

4. Mustafina Zh.G. Integrated hematological parameters in the assessment of immunological reactivity in patients with ophthalmopathology / Mustafina Zh.G., Kramorenko Yu.S., Kobtseva V.Yu. // Wedge. lab. diagnostics. - 1999 - No. 5. - S. 47–49.

5. Yumashev, A. V. Intolerance to orthopedic constructions, the phenomena of galvanism /

A. V. Yumashev, E. A. Kristal, I. G. Kuderova // Health and education in the XXI century. - 2012. - T. 14, No. 2. - S. 26.

6. Contact allergy to gold is correlated to dental gold / C. Ahlgren, I. Ahnlide, B. Bjorkner,

M. Bruze, R. Liedholm, H. Moller, K. Nilner // Acta Dermato-Venereologica. - 2002. - Vol. 82 (1). - P. 41–44.

7. Mikhalchenko D.V., Zhidovinov A.V., Mikhalchenko A.V., Danilina T.F. The local immunity of dental patients with oral galvanosis // Research Journal of Pharmaceutical, Biological and Chemical Sciences. 2014. -Vol. 5. -No. 5.-p. 712-717.

8. Wataha, J. C. Biocompatibility of dental casting alloys: a review / J. C. Wataha // The journal of prosthetic dentistry. - 2000. - Vol. 83 (2). - P. 223–234.