LABORATORY MONITORING OF PERIODONT INFLAMMATORY DISEASES
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Abstract: It is known that periodontitis is a multifactorial chronic irreversible inflammatory disease that affects the supporting structures of the teeth, initiated and spread by a complex interaction between periopathogens and the host's immune system. It begins with a microbial infection, followed by periodontal tissue damage caused by leukocyte hyperactivity, cytokines, eicosanoids and matrix metalloproteinases. Based on the assessment of their diagnostic properties, the most informative laboratory biomarkers of oral fluid microflora, proteolytic enzymes cathepsin, elastase, haptoglobin, IL-1, IL-4, IL-6, IL-8, IL-10 and TNF-α were determined in gingivitis and chronic periodontitis. It allows to evaluate the diagnostic efficiency of these markers in patients with periodontal diseases and to use them for early diagnosis in non-invasive diagnostics [1].

Systematic reviews and meta-analyses have identified five promising oral fluid biomarkers as the basis for effective diagnostics for the early diagnosis of periodontal diseases. According to the results of our research, the markers change sequentially in different stages of periodontitis, so the combination of biomarkers gives a more effective result for the diagnosis of the disease state [2].

RESEARCH METHODOLOGY. Researches were conducted in the educational laboratory of the medical and biological chemistry department of the Tashkent state dental institute of the Ministry of Health of Uzbekistan and the therapeutic dentistry department.

68 subjects consisting of somatically healthy individuals and patients with chronic disseminated periodontitis (STP) of moderate severity were observed. The control group consisted of 16 healthy, 30.3±2.1-year-old, non-physiological forms of chronic periodontal disease involving oral mucosa, without bad habits and taking any medications. The gender distribution in this group was as follows: 45 men (66.1%) and 23 women (33.9%).

Clinical, biochemical and immunological research methods were used in the examination of patients.

ANALYSIS AND RESULTS. This study can be included in the series of basic biomarkers by comparing the level of cytokines in the oral fluid of patients with periodontal disease of soft and hard tissue inflammation (primary gingival cause).

Table 1

Biochemical Indicators of Oral Fluid in Patients with Gingivitis and Moderate Chronic Generalized Periodontitis

Indicator	Healthy Group (n=14)	Gingivitis Group (n=26)	CGP Group (n=28)
Lactate (mmol/l)	0,36±0,04	2,1±0,3*	3,4±0,3*
Lactate dehydrogenase (U/l)	214,2±11,3	289,6±12,7*	421,2±23,5*
Acid phosphatase (U/l)	13,8±0,9	16,5±1,4*	30,4±1,7*
Amylase (U/l)	57,6±4,4	25,6±0,8*	20,3±1,8*
Ceruloplasmin (mg/dl)	9,8± 0,8	15,4±1,2*	18,7±1,7*

*Note: * - significance of differences P < 0.05

Table 2

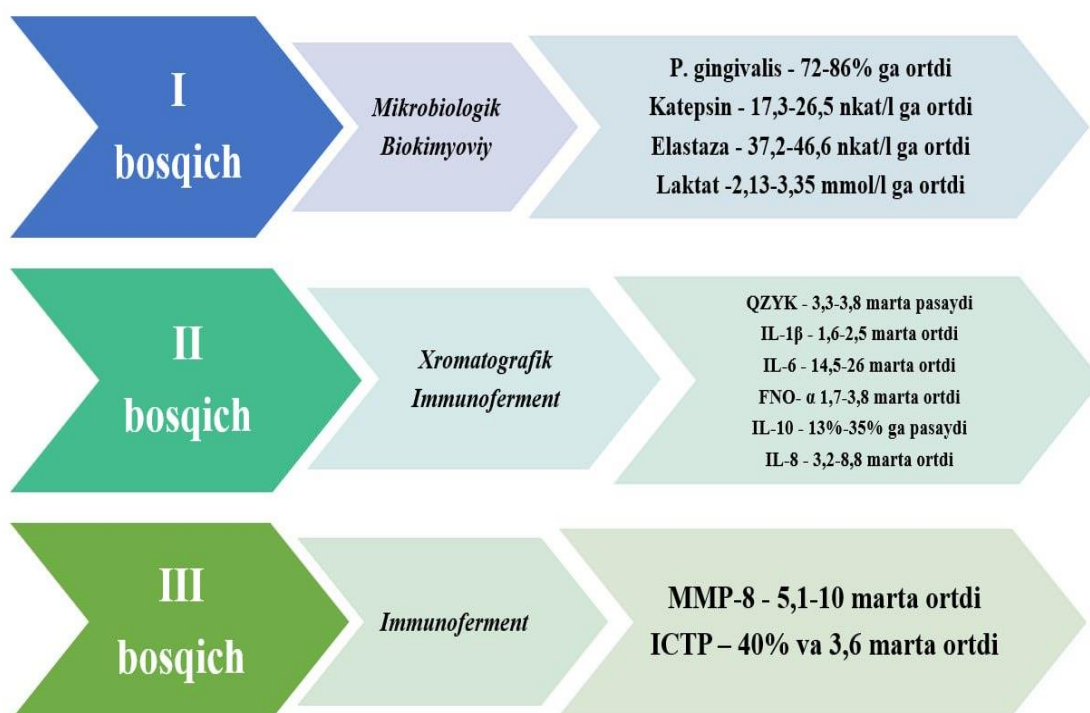**Content of SCFAs in Oral Fluid in Patients with Chronic Generalized Periodontitis**

Monocarboxylic Acids	**Absolute Content, Units**	
	Healthy Individuals (n=12)	**Patients with CGP (n=18)**
C2 (acetic)	0,87 ± 0,062	0,26 ± 0,02*
C3 (propionic)	0,18 ± 0,015	0,07 ± 0,006*
C4 (butyric)	0,05 ± 0,003	0,013 ± 0,002*

*Note: * - significance of differences P < 0.05

The analysis of the results of the study presented in the table shows that the amount of IL-1β in the oral fluid of patients with periodontal diseases is significantly increased compared to that of the healthy people. Thus, the increase of inflammatory agents IL-1β, IL-6 and TNF-α in the oral fluid of patients with gingivitis and chronic periodontitis activates destructive processes in the periodontal tissue. Increased levels of IL-4 in patients with periodontal disease may be considered as an anti-inflammatory mediator that stimulates V-lymphocytes and inhibits T-helper cells [3]. Consequently, the local humoral anti-inflammatory protective activity is maintained at a high level due to increased IL-4 levels in patients with periodontal pathology. According to the results of the study, the level of IL-8 in patients with periodontitis exceeds the initial level by an average of 8.1 times. Therefore, it is not surprising that there is interest in cytokines as laboratory indicators, in particular, to detect disease recurrence and to evaluate the effectiveness of therapy [4,5].

During the study, based on the evaluation of several laboratory indicators of oral fluid, we determined the most informative laboratory biomarkers of oral fluid in gingivitis and chronic periodontitis. These included the following: IL-1, IL-6, IL-8, TNF-α, MMP-8. It was also shown that the tests with the highest diagnostic value have a positive result

value for the development of an algorithm for laboratory monitoring of gingivitis and periodontitis.

I bosqich — Mikrobiologik Biokimyoviy — P. gingivalis - 72-86% ga ortdi / Katepsin - 17,3-26,5 nkat/l ga ortdi / Elastaza - 37,2-46,6 nkat/l ga ortdi / Laktat -2,13-3,35 mmol/l ga ortdi

II bosqich — Xromatografik Immunoferment — QZYK - 3,3-3,8 marta pasaydi / IL-1β - 1,6-2,5 marta ortdi / IL-6 - 14,5-26 marta ortdi / FNO- α 1,7-3,8 marta ortdi / IL-10 - 13%-35% ga pasaydi / IL-8 - 3,2-8,8 marta ortdi

III bosqich — Immunoferment — MMP-8 - 5,1-10 marta ortdi / ICTP – 40% va 3,6 marta ortdi

Laboratory monitoring algorithm for gingivitis and chronic periodontitis

CONCLUSIONS. The results obtained during the research have theoretical and practical significance. Informative content of oral fluid biomarkers for assessment of disease severity in patients with gingivitis and periodontitis was demonstrated.

Cathepsin activity was found to increase by 2.6 times in the oral fluid of patients with gingivitis, and by 3.9 times in patients with intact periodontal tissue. Elastase activity was 37.24 ± 2.97 nkat/l, which is 44% higher than that of periodontitis subjects, and the studied index in periodontitis patients was 80% higher than the baseline level of healthy subjects. Agents involved in inflammation and anti-inflammation: IL-1 increased by 1.6-2.5 times, IL-6 increased by 14.5-26 times, IL-8 increased by 3.2-8.8 times, IL- 10 - 13% - 35% decreased.

The study of the parameters of the oral cavity fluid expands the possibilities of monitoring the effectiveness of the treatment of patients with periodontal disease and early diagnosis with the help of screening tests using non-invasive methods.

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