

Cytokine Status of Salivary Fluid in Patients with Coronavirus Infection

F. U. Jabborova

Bukhara State Medical Institute

ABSTRACT

Purpose: The article presents the results of a study of 2 major cytokines interleukin-1 beta and TNF- α in 30 patients with COVID-19, depending on the severity.

Materials and methods: Immunological studies were carried out on 30 saliva in patients with moderate and severe COVID-19 at the Republican Specialized Center No. 2 for coronavirus infection in 2020. All studies were carried out in the laboratory of immunocytokines of the Institute of Immunology of the Academy of Sciences of the Republic of Uzbekistan.

Results: 1. Analysis of interleukin in patients with IL-1 beta in patients with COVID-19 showed that in the group of moderate patients, the concentration was increased by 2 times, and in the group of severe patients - by 2.7 times. A significant increase in TNF- α production in saliva was also found in patients with moderate and severe COVID-19 by 2.8 times and 4.9 times, respectively.

Conclusion: Increased values of IL-1 beta and TNF- α in saliva in patients with moderate and severe COVID-19 prove the presence of a current inflammatory process in this case and in the oral cavity.

KEYWORDS: *cytokines, interleukin-1 beta, TNF- α , saliva, COVID-19.*

Introduction: Oral signs and symptoms associated with COVID-19 are known to include taste disturbances, non-specific mouth ulcers, desquamative gingivitis, petechiae, and coinfections such as candidiasis [5,8,9,11,12,15]. However, it is still not clear whether these manifestations may be a true clinical presentation resulting from direct infection with SARS-CoV-2, or systemic consequences, given the possibility of coinfections, weakened local immune reactivity and adverse reactions to therapy [1,2,4,5,7].

Since the prevalence of clinical manifestations is still not fully known, the spectrum of manifestations of COVID-19 in the oral cavity is considered a subject of wide and current interest, therefore, a live systematic review approach is needed that will allow continuous observation of recently published studies through periodic search to include new relevant information, especially on a topic that is constantly updated in the context of COVID-19. Therefore, the aim of this work is to investigate the clinical oral manifestations in patients with COVID-19 and to study the local immunity of the oral cavity. To achieve these goals and objectives, we have used modern approaches in diagnostics, especially in laboratory immunodiagnostics.

In recent years, much attention has been paid not to the study of cellular and humoral factors of systemic immunity, but most of all, emphasis is placed on factors of local immunity, especially depending on the clinical features of the course of the disease, which gives a broader and more correct understanding of changes in local immunity, especially against the background of the course of an infectious disease. pathology [1,6,7].

The aim of the study was to assess the cytokine status of salivary fluid in patients with coronavirus

infection, depending on the severity.

Research materials: Immunological studies were carried out on 30 saliva in patients with moderate and severe COVID-19 at the Republican Specialized Center No. 2 for coronavirus infection in 2020.

Immunological research methods determination of cytokines

Determination of cytokines in biological fluids. Determination of the level of cytokines was carried out by enzyme immunoassay using commercial test systems "Human", Germany. The test systems are based on the sandwich method of enzyme-linked immunosorbent assay using horseradish peroxidase as an indicator enzyme. Reagent kits are a kit, the main reagents of which are mAb to the studied cytokines, adsorbed on the surface of the wells of a collapsible polystyrene plate. The kits are designed for the quantitative determination of human cytokines in peripheral blood serum and biological fluids. The optical density in each well was measured using an automatic microplate photometer at a wavelength of 450 nm by enzyme immunoassay on a Stat-Fax analyzer (USA). For research, we used sets of enzyme immunoassay test systems "Human" made in Germany, 2020.

Statistical processing of the results was carried out using the Excel-2018 program, reflecting the dependence of optical density on concentration for the standard antigen.

Results and discussion: it is known that cytokines are considered as proteins that are actively produced by cells of the immune system and are mediators of intercellular interactions during the immune response [3,4,5]. Proinflammatory cytokines, being produced, begin to act through their receptors on immunocompetent cells at an early stage of the inflammatory response, participating in the launch of a specific immune response and in its effector phase [6,7].

Thus, we studied the main two pro-inflammatory cytokines TNF- α and IL-1 beta, which are pro-inflammatory in nature. Comparative analysis revealed an increase in pro-inflammatory cytokines compared to control values.

Table 1. The content of cytokines in salivary fluid in patients with COVID-19, (M \pm m)

Groups of surveyed	IL-1 β ,	IL-1 β ,
Moderate COVID-19	6,7 \pm 0,32*	6,52 \pm 1,24*
Severe COVID-19	8,75 \pm 2,2*	11,7 \pm 2,6* [^]
Control	3,22 \pm 1,65	2,36 \pm 1,14

TNF-alpha cytokine, it should be noted that this cytokine has damaging properties, therefore, we took exactly that cytokine to study damage in the oral mucosa. Thus, TNF-alpha was increased in the group of people with moderate and severe COVID-19. The table shows that in the control, the level of TNF-alpha was 2.36 \pm 1.14 ng/ml, while in persons with moderate COVID-19 it was 6.52 \pm 1.22 ng/ml, and in severe patients it was 11.7 \pm 2.6 ng/ml, the values of the patients were significantly different from the data of the control group. It can be seen that in the group of moderately severe patients, the level of TNF-alpha was increased by 2.8 times compared with control values, and in the group of severe patients, the level of TNF-alpha was increased by 4.9 times compared with the control value. It can be seen from the table that there are also differences between groups of patients, it can be seen that in the group of people with severe COVID-19, the highest content of TNF-alpha in saliva is noted, which is consistent with the literature data and the characteristics of the clinical lesion of the oral mucosa. Thus, the analysis of the content of TNF-alpha revealed the presence of a significant increase in the saliva of persons with moderate and severe COVID-19. Moreover, a pronounced increase in TNF-alpha was found in the group of people with severe COVID-19 ($p > 0.05$). Next, the concentration of IL-1 beta in saliva was studied. As can be seen from the table, the content of IL-1 beta in saliva in the control group was 3.22 \pm 1.65 ng/ml, while in persons with

moderate COVID-19 it was 6.7 ± 0.32 ng/ml, and in severe patients - 8.75 ± 2.2 ng/ml. It can be seen that the values of IL-1 beta in saliva were increased in groups of individuals with moderate and severe COVID-19. Differences were significant with the data of the control group. Thus, in the group of moderately severe patients, the level of IL-1 beta was increased by 2 times compared to the control values, and in the group of severe patients, the level of IL-1 beta was increased by 2.7 times compared to the control value. It can be seen from the table that there are also differences between the groups of patients, but they are not significant. It is a fact that in groups of people with a severe course of COVID-19, the level of IL-1 beta was elevated, which once again proves the current inflammatory process in this case in the oral cavity. The most pronounced inflammation is observed in the group of people with severe COVID-19 ($p > 0.05$).

Conclusions.

1. In patients with COVID-19. in the group of moderate patients, the concentration of IL-1 beta was increased by 2 times, and in the group of severe patients - by 2.7 times, which indicates the current inflammatory process.
2. The concentration of TNF- α in saliva was increased in the group of people with moderate and severe COVID-19 by 2.8 times and 4.9 times, respectively.

References:

1. F. U. Zhabborova. Adaptive mechanisms of local immunity of the oral mucosa in coronavirus infection//. Procuding of internat ional conference. Hosted from Telavi. Georgiya 17-18 March. 2021. 186-187 pp
2. F. U. Zhabborova. Local immunity of the oral mucosa in coronavirus infection//. Internat ional conference. Education and Science 2021. 203-204 pp
3. F. U. Zhabborova. Adaptive mechanisms of local immunity of the oral mucosa membrane of the cavity during in coronavirus infection//. Journal NX 2021.100-102pp
4. Bogatov A. I. Our method of treatment of periodontal diseases in children with cerebral palsy. // Samar. med. Journal. 2001. N 4. C. 44
5. Eronov E. K., Mirsalihova F.L., Ragabov A.A. Prevention and treatment of caries in children with cerebral palsy. ACADEMICIA: AnInternational Multidisciplinary Research Journal Vol. 9 Issue 12, December. 2019.–pp. 68-70. Impact factor- 7.13
6. Eronov E. K., Ragabov A.A. Assessment of the evaluation of oral hygiene in children with cerebral palsy. Asian Journal of Multidimensional Research (AJMR)Vol. 9 Issue 2 February 2020. – pp.189-191.Impact factor- 6.88.
7. Eronov E. K., Ragabov A.A.Analytical indicator of saliva in children with cerebral palsy. ACADEMICIA: An International Multidisciplinary Research Journal Vol. 10 Issue5 2020. – pp. 1823-1825. Impact factor- 7.13