SIGNIFICANCE OF IMMUNOPHENOTYPING OF PERIPHERAL BLOOD LYMPHOCYTES IN THE DIAGNOSIS OF COVID-19

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Abstract

We know that a protective antiviral immune response depends on the activation of CD8 + T cells and the destruction of infected cells, but in patients with COVID-19 there is a suppression of the total number of lymphocytes and an effective antiviral immune response. In addition to lymphopenia, patients with COVID-19 have also been shown to have a cytokine release syndrome, especially in severe cases [11,14,23], which clearly indicates disease progression. The innate immune response is the first step in the defense mechanism against viral infection. Pattern recognition receptors in host dendritic cells recognize viral genomic DNA or RNA to initiate the production of cytokines and chemokines [3,6,7,9,11,12,16,24], which in turn attract immune cells such as macrophages, neutrophils and T cells, to the site of infection depending on their source and target cells [2,6,7,14].

Keywords: COVID-19, severe course, cytokines, inflammatory mediators, distress syndrome, respiratory viral infections.

Material and Research Methods

For this purpose, we examined 60 hospitalized patients with confirmed COVID-19 (34 men and 26 women) who were hospitalized at the State Institution "Specialized Hospital "Zangiota 1" for the treatment of patients with coronavirus infection" and 25 practically healthy patients of the same sex and age for comparison of the results of immunophenotyping.

The diagnosis of COVID-19 was based on the current protocols of the Ministry of Health of the Republic of Uzbekistan using a combination of clinical symptoms, assessment of the severity of the disease, computed tomography (CT) and laboratory data. All patients were laboratory confirmed positive for SARS-CoV-2 using real-time polymerase chain reaction (RT-PCR) throat swab samples.

The results of the study and their discussion. An analysis of the features of the immune response showed that the percentage of lymphocytes was significantly significantly reduced in patients with COVID-19 than in the control group ($p<0.0001$). The results of immunophenotyping showed a significant decrease in the percentage of the main subpopulations of T-lymphocytes - CD4+ and CD8+ T-lymphocytes in patients with COVID-19 compared with the control group ($p<0.01$, respectively). It was shown that the percentage

of CD16+ NK cells and CD56+ NK cells differed statistically in patient groups with control group data, while showing a significant increase in killer cells in patient groups by almost 2 times compared with control group data.

Conclusions:

1. A significant increase in the cytokines IL-1 beta, IL-6 and IFN-gamma was shown in both groups of patients, and in the group of severe patients a significant increase in these cytokines was observed.
2. It has been shown that the proposed simple panel with three cytokines can be used as predictors for the rapid diagnosis of patients at higher risk of worsening COVID-19 disease.
3. The level of IFN-γ showed a slight increase in the heavy group compared with the values of the moderate group. It was shown that the levels of IL-1 beta and IFN-gamma are dependent on the difference in age, while the dependence of IL-6 on age was not significant. Also, no relationship between IL-6 levels and gender was found.

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