

CONVALESCENTS AFTER COVID-19 AND COPD: PECULIARITIES OF THE IMMUNE REACTIVITY

O. I. Lemko, N. V. Vantiukh, D. V. Reshetar, S. V. Lukashchuk

Uzhhorod National University, Uzhhorod, Ukraine

Abstract. The long-term negative consequences of the COVID-19 pandemic for the health of patients who had recovered raise new challenges for medical science. This is due to the development of post-COVID syndrome, which is characterized by polysyndromic lesions and further formation of chronic pathology.

The aim. Based on the study of cytokine status and cellular immunity, to compare the activity of the inflammatory process and the severity of immune dysfunction in convalescents after COVID-19 without a history of bronchopulmonary pathology 1–2 months after the acute period with similar indices in convalescents after coronavirus infection with chronic obstructive pulmonary disease (COPD) and patients with COPD beyond exacerbation.

Materials and methods. 31 COVID-19 convalescents with moderate severity, aged 34–67 years were examined 1–2 months after the acute period of the disease. These patients had no previous diseases of the bronchopulmonary system (group 1). The second group included 44 convalescents aged 41–68 years, in whom the infection occurred already against the background of existing COPD (GOLD II–III). The third group consisted of 73 patients with COPD (GOLD II–III) beyond exacerbation, who did not have COVID-19. The control group of apparently healthy individuals included 24 individuals. The activity of the inflammatory process was determined by the levels of pro- and anti-inflammatory cytokines by the enzyme-linked immunosorbent assay method. Nonspecific resistance was studied by determining the phagocytic activity and phagocytic number of monocytes. Cellular immunity indices were investigated by indirect immunofluorescence reaction using monoclonal antibodies (CD3⁺, CD22⁺, CD4⁺, CD8⁺, CD16⁺) and indices characterizing the relationships between the studied subpopulations were calculated.

Results. According to the levels of pro- and anti-inflammatory cytokines in convalescents after COVID-19 in group 1, residual inflammatory activity persists 1–2 months after the acute period of the disease. The severity of this process corresponds to chronic systemic inflammation in patients with COPD beyond the exacerbation and can be a real basis for the development of chronic pathology of any localization. These data were also confirmed by an increased level of circulating immune complexes and suppression of the phagocytic activity of monocytes. The decrease in the number of T-lymphocytes number was more significant in convalescents after COVID-19, but the decrease in the CD4⁺/CD8⁺ ratio and the number of natural killer cells was more pronounced in patients with COPD.

Conclusions. In convalescents after COVID-19 of moderate severity 1–2 months after the acute period of the disease significant residual activity of the inflammatory process persists, which in its severity corresponds to that in patients with COPD beyond exacerbation. These changes are combined with disturbances of nonspecific resistance and cellular immunity, which in some parameters are even more pronounced than in patients with COPD. The revealed changes indicate the presence of immune dysfunction and impaired interaction of immune cells, which may be the basis for the development of chronic pathology. These changes and the existing residual activity of inflammation determine the necessity for rehabilitation in the near future after the acute period of coronavirus infection.

Key words: convalescents after COVID-19, chronic obstructive pulmonary disease, immune reactivity.