

IMMUNOLOGICAL PARAMETERS AS INDICATORS OF INFLAMMATORY PROCESSES IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE AND CHRONIC BRONCHITIS IN REMISSION

**E. M. Rekalova, O. R. Panasyukova, Y. A. Matvienko,
S. G. Yasyr, M. B. Singaievskyi**

Abstract

Aim: to determine the content of the pro- and anti-inflammatory cytokines, characterizing the state of T-helper cells 1, 2 and 17 types in the peripheral blood of patients with chronic obstructive pulmonary disease (COPD) and chronic bronchitis (CB) in phase of remission.

Materials and methods: clinical-functional and immunological examination of 24 patients with COPD and 11 patients with CB in phase of remission was performed. Immunological assessment included measurement of the blood lymphocytes and their subsets by dual-color laser flow cytometry and monoclonal antibodies to antigens differentiating lymphocytes (CD3 +, CD4 +, CD8 +, CD816 +, CD19 +). The serum levels of the proinflammatory cytokines (IL-8, IL-2, TNF α , and IL-17A), anti-inflammatory cytokine (IL-4) and a mediator of inflammation (C-reactive protein — C-RP) were determined by ELISA.

Results: Differences in the condition of the immune system were found in patients with COPD and CB. Patients with COPD showed characteristic increase of the percentage of natural killer cells CD3-16⁺ to $(14,7 \pm 1,9)\%$, the absolute content of B lymphocytes CD3-19⁺ to $(0,30 \pm 0,04) \cdot 10^9 / l$, the level IL-17A to $(1,26 \pm 0,07) \text{ pg/ml}$ and C-RP to $(13,0 \pm 2,7) \text{ mg / l}$ in blood. COPD patients with the normal serum levels of IL-17A (from 0,84 pg/ml and 1,24 pg/ml) had forced expiratory volume in 1 second (FEV₁) within the normal range - $(81,7 \pm 5, 8) \%$. In patients with the reduced IL-17A (less than 0,84 pg/ml) FEV₁ also remained at high enough level - $(76,0 \pm 6,2)\%$. The increase of IL-17A in the blood above 1,24 pg/ml was observed in patients with severe limitation of lung function with a decrease in FEV₁ to $(52,8 \pm 5,9)\%$ ($p < 0,05$).

Patients with CB were characterized by relatively $(3,8 \pm 0,3)\%$, and absolute $(0,20 \pm 0,03) \cdot 10^9 / L$ peripheral blood monocytopenia and TNF α serum concentration reduction down to $(0,49 \pm 0,05) \text{ pg/ml}$.

Conclusion. The identified features of the immune status of patients with COPD (increased percentage of natural killer lymphocytes, absolute B-lymphocytes, levels of IL-17A and C-RP in the blood of patients) indicate activity of the chronic inflammation in the respiratory system and may reflect the formation of systemic inflammatory response. The most expressed obstructive disturbances of pulmonary ventilation in COPD patients are typically accompanied by higher serum concentrations of IL-17A. This indicates that chronic inflammation in COPD patients is active and persistent in remission as well. Monocytopenia and some decrease of the T-helpers type 1 activity (identified by the serum levels of TNF α) in patients with CB, in contrast to COPD patients, are the evidence of an immune system dysfunction, manifested by a lack of systemic inflammation and weak chronic inflammatory process.

Key words: chronic obstructive pulmonary disease, chronic bronchitis, immunological parameters, the inflammatory process.

Ukr. Pulmonol. J. 2016; 3:30–34.

Elena M. Rekalova

*SO "National Institute of Phthysiology and Pulmonology
named after F. G. Yanovsky NAMS of Ukraine"*

Head of the Laboratory of Clinical Immunology

Doctor of medicine

10, M. Amosova str., Kyiv, 03680, Ukraine

Tel.: +38(066)138-61-49, pulmonol@ifp.kiev.ua