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The features of cellular immunity in patients with treatment-resistant asthma

Background: Although the majority of patients can achieve the goal of well controlled asthma, in some patients asthma will not be controlled even with optimal therapy. Treatment-resistant or refractory asthma refers to patients with a confirmed diagnosis of asthma, whose symptoms remain poorly controlled despite high-dose of inhaled corticosteroids plus a second controller such as long-acting β2-agonist and management of comorbidities.

Objective: To identify the features of cellular immunity in patients with treatment-resistant asthma.

Methods: 52 patients with asthma and 30 matched control subjects were included. 33 patients had controlled asthma (well and partial control), 11 patients – uncontrolled asthma and 8 patients – treatment-resistant asthma. All patients underwent detailed clinical examination and spirometry. Investigation of $CD3^+$, $CD4^+$, $CD8^+$, $CD8+CD3^-$, $CD16^+$, $CD3^+CD16^+$, CD25+, $CD4^+CD25hi$ - lymphocytes in blood was carried out by flow cytometry.

Results: Patients with treatment-resistant asthma had significantly lower values of $CD4^+CD25hi$ - cells than patients with controlled asthma (5.09±1.15% vs 6.52±1.37%; $p<0.01$) and controls; they also had significantly lower values of CD16+ lymphocytes than patients with controlled asthma (10.57 (8.76-13.06)% vs 14.56 (12.87-17.62)%; $p<0.05$), uncontrolled asthma and controls.

Conclusion: Naturally occurring T-regulatory cells as well as natural killer cells with the phenotype CD16+ may contribute to achieving and maintaining control of asthma. Identified features of cellular immunity in patients with treatment-resistant asthma can determine the course of asthma and validate the usefulness of additional diagnostic and therapeutic measures.