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**Title:** The prognostic value of IFN-γ and IL-4 cytokines ratio and CD25+ lymphocytes blood content for asthma exacerbation

Dr. Zhanna 4820 Antanovich zhantonovich@mail.ru MD , Prof. Dr Vladimir 4821 Tsarev Tsarevvp@inbox.ru MD and Ms. Natalia 4822 Goncharova ksju2006@mail.ru . [1] 3rd Department of Inner Diseases, Belarusian State Medical University, Minsk, Belarus, 220095 ; [2] Department of Propedeutics of Inner Diseases, Belarusian State Medical University, Minsk, Belarus, 220037 and [3] Laboratory of the Stem Cells Biology and Genetics, Belarusian Research Center for Transfusiology and Medical Biotechnologies, Minsk, Belarus .

**Body:** Background: Asthma is a disease characterized by a chronic airway inflammation, so it is important to find biomarkers to assess the activity of inflammation and to predict asthma exacerbation. Objective: To evaluate IFN-γ and IL-4 cytokines ratio and CD25+ lymphocytes blood content in patients with asthma and to predict asthma exacerbation. Methods: We included 48 patients with asthma exacerbation and 48 with asthma remission and 30 matched control subjects. All underwent detailed clinical examination and spirometry. IFN-γ and IL-4 cytokines concentration in blood was measured by enzyme immunoassay. Investigation of CD25+ lymphocytes in blood was carried out by flow cytometry. Results: Patients with asthma exacerbation had significantly lower values of IFN-γ and IL-4 ratio than patients with asthma remission (0,026 (0,016-0,046) vs 0,092 (0,066-0,157); p<0,001) and controls (1,44 (1,17-1,69); p<0,001), they also had significantly higher values of CD25+ cells than patients with asthma remission (10,22 (4,92-13,09)% vs 5,85 (4,14-7,83)%; p<0,001) and controls (5,49 (3,69-6,01)%; p<0,001). The regression equation for asthma exacerbation prediction is:
Z=exp(1,40005+0,107702X-54,223Y)/(1+exp(1,40005+0,107702X-54,223Y)), where X – IFN-γ and IL-4 ratio; Y – % of CD25+ lymphocytes. If Z≤0,5, the patient has remission; if Z>0,5, the patient has exacerbation; the above Z, the above asthma exacerbation probability. The value of correct predictions is 89%. Conclusion: Decrease of IFN-γ and IL-4 cytokines ratio and increase of CD25+ lymphocytes blood content can be predictor for asthma exacerbation and allows predicting asthma exacerbation with the probability of 89%.