Title: Functional and immunological abnormalities in patients with severe asthma

Dr. Olga 19062 Kharevich olkash1@yandex.ru 1,2, Dr. Irina 19063 Lapteva irinalapteva@mail.ru 1, Dr. Elena 19064 Lapteva e.lapteva@tut.by 2, Dr. Elena 19065 Koroleva olkash1@yandex.ru 1 and Dr. Natalia 19066 Shpakouskaya olkash1@yandex.ru 1. 1 Pulmonology, Republican Scientific and Practical Centre of Pulmonology and Tuberculosis, Minsk, Belarus and 2 Phthisiopulmonology, Belarusian Medical Academy of Post-Graduate Education, Minsk, Belarus.

Body: Introduction. Patients with severe asthma tend to have impaired lung function and immune imbalance despite the high-intensity treatment. Aims. The aim of the study was to reveal the functional and immunological abnormalities in severe asthma as compared with nonsevere disease. Methods. In the recent research we have studied the functional parameters and serum cytokine levels in 41 patients with severe asthma and in 42 patients with nonsevere disease. Results. We found lower spirometric values, the presence of irreversible airway obstruction (IAO, in 76% patients), increased ratio of residual volume to total lung capacity (RV/TLC) and decreased diffusion capacity of the lungs (DLCO) in severe asthma group as compared with nonsevere. Serum cytokine profile in patients with severe asthma characterized by increased levels of TNF-α, IL-1β and IFN-γ. We revealed correlation between the presence of IAO and increased RV/TLC, and between the development of air-trapping (estimated at RV/TLC>140% pred) and reduced DLCO. Also, the IAO and air-trapping correlated with the lower level of IL-4 in patients with severe asthma. Conclusion. Severe asthma is characterized by the development of irreversible airflow limitation, air trapping, decreased diffusion capacity, which suggests that these patients tend to have more considerable airway remodeling, including structural changes in small airways. Imbalance in Th1/Th2 cytokine production in severe asthma indicates that immunological processes in severe asthma are different from the mechanisms of nonsevere disease.