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**Title:** Air-trapping and decreased diffusion capacity in patients with severe asthma

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**Body:** Introduction. Patients with severe asthma tend to have impaired lung function despite the high-intensity treatment. Aims. The aim of the study was to assess the lung function parameters in patients with severe asthma compared with nonsevere disease. Methods. In the recent research we have studied data of pulmonary function tests (spirometry, bodyplethysmography, diffusion capacity) in 31 patients with severe and in 23 patients with nonsevere asthma. To compare two groups of patients we used the Mann-Whitney U-test and Chi-squared test. Data are presented as median (interquartile range). Results. Patients with severe asthma compared with those with nonsevere disease had lower VC, pre- and postbronhodilator FVC, pre- and postbronhodilator FEV<sub>1</sub>. However, FEV<sub>1</sub>/FVC was comparable in both groups. The presence of nonreversible airway obstruction was revealed in 77% patients with severe asthma and in 43% with nonsevere asthma (p=0,011). TLC was similar in patients with severe and nonsevere asthma, but RV and RV/TLC was significantly higher in severe asthma group (RV: 192,6 (160,2-249,5) vs 163,8 (143,9-174,7) % pred, p= 0,018; RV/TLC: 145,0 (132,1-161,6) vs 119,1 (112,5-135,4) % pred, p=0,001). These findings indicate the presence of more prominent air trapping in patients with severe asthma. The study revealed the decreased DLCO in severe asthma group (73,1 (57,0-81,1) vs 85,1 (78,4-94,4) % pred, p=0,008). Conclusion. The presence of persistent airflow limitation, air trapping and decreased diffusion capacity are important features of lung function impairment in patients with severe asthma, suggesting that these patients have more considerable airway remodelling and structural changes of lung parenchyma.