# Impact of pharmacotherapy with tiotropium/olodaterol on the pulmonary function in COPD patients depending on the Arg16Gly polymorphism of ADRB2 gene

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**Conflict of interest:** none

**BACKGROUND.** Chronic obstructive pulmonary disease (COPD) is a widespread chronic disease, that can be prevented and treated. Internal or genetic factors play a significant role in the COPD development.
**OBJECTIVE.** To investigate a response to the tiotropium/olodaterol treatment in patients with different ADRB2 gene polymorphism.
**MATERIALS AND METHODS.** 100 patients with the diagnosis of COPD were included into the study. Pulmonary function testing was performed during all study visits. All patients received treatment according to GOLD 2019, which included a combination of long-acting $\beta_2$-agonists and long-acting muscarinic antagonists. According to the results of genetic testing all patients were divided into three groups: Arg16Arg – 23 patients (23 %), Arg16Gly – 39 (39 %), Gly16Gly – 38 (38 %).
**RESULTS.** Groups did not differ by sex, age, part of smokers, COPD duration. There was a significant difference in force vital capacity (FVC), which was 66.92±4.33 % in Arg16Arg group, 79.75±3.51 % in Arg16Gly group and 76.59±2.73 % in Gly16Gly group (p=0.05). There was a weak negative correlation between Arg16Arg genotype and FVC (r=-0.204; p=0.043). In regression analysis Arg16Arg genotype was associated with 10.52 % lower FVC on average (odds ratio -10.523; 95 % confidence interval from -20.502 to -0.544; p=0.039). A statistically significant improvement of forced expiratory volume in the first second ($FEV_1$) and FVC was observed in all groups during the study (p<0.001).

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**CONCLUSIONS.** Arg16Arg genotype was associated with the lowest FVC values during all study visits. Combination of tiotropium/olodaterol was effective in improving pulmonary function in patients with different ADRB2 genotypes, which was demonstrated by a significant improvement of $FEV_1$ and FVC in study groups during the study.

**KEY WORDS:** COPD, ADRB2 gene, pulmonary function, polymorphism.