

## PECULIARITIES OF THE COURSE OF COPD IN PATIENTS WITH DIFFERENT A46G (RS1042713) ALLELES OF ADRB2 GENE

K. D. Dmytriiev, Y. M. Mostovoy, N. S. Slepchenko, N. I. Sinchuk

### Abstract

A significant number of genetic factors, modulating inflammation, fibrosis and bronchial responsiveness, plays an important role in development of chronic obstructive pulmonary disease. Particularly, polymorphism of ADRB2 gene is associated with the development and severity of COPD, as well as with a response to beta-2 agonists.

*Aim* — to study the prevalence of ADRB2 gene polymorphism among COPD patients and to reveal its possible relationship with the development of COPD and its clinical course.

*Materials and methods.* 100 patients with the diagnosis of COPD were included into the study. An mean age was  $64.09 \pm 1.94$  years. There were 66 men (66 %) and 34 women (34 %). There were 68 smokers (68 %), an average smoking experience was  $24,44 \pm 4,84$  pack-years. Mean COPD duration was —  $9.35 \pm 2.42$  years. We collected data about the amount of exacerbations, use of antibiotics, glucocorticoids, methylxanthines, data of mMRC and CAT questionnaires in all patients. Questionnaire data were collected during three visits — visit of inclusion, visit 2 ( $5 \pm 1$  weeks), visit 3 (1 year). Data about exacerbation and drugs use were collected for the year prior to the study and the year of participation.

*Results.* Regarding the presence of ADRB2 gene polymorphism all patients were allocated to 3 groups: group 1 — 23 (23 %) A46A allele carriers; group 2 - 39 (39 %) A46G allele carriers and group 3 — 38 (38 %) G46G allele carriers. Duration of COPD was greater in group 3 compared to the group 1 ( $7,08 \pm 1,59$  vs  $10,5 \pm 0,98$ ) ( $p < 0,05$ ). Group 2 and group 3 had greater proportion of patients with COPD GOLD D ( $46,15 \pm 8,32$  % and  $44,73 \pm 8,28$  % correspondingly), when compared to group 1 ( $17,39 \pm 8,38$  %) ( $p < 0,05$ ). Group 1 had less exacerbations ( $2,13 \pm 0,22$ ) when compared to group 2 ( $2,97 \pm 0,28$ ), and group 3 ( $2,86 \pm 0,25$ ) ( $p < 0,05$ ). Duration of treatment with antibiotics was significantly shorter in A46A allele carriers ( $8,61 \pm 1,60$  days), when compared to two other groups (in group 2 -  $13,64 \pm 1,25$  days, in group 3 -  $13,00 \pm 1,28$  days) ( $p < 0,05$ ). Duration of treatment with GCS in group 1 ( $2,95 \pm 0,85$  days), A46A allele carriers, was shorter when compared to group 2 ( $5,28 \pm 0,94$  days), A46G allele carriers ( $p < 0,05$ ).

*Conclusions.* Occurrence of polymorphic (A46G) and mutant (G46G) alleles of ADRB2 gene was associated with more severe course of COPD, greater amount of exacerbations and hospital admissions, greater need in antibiotics and GCS, indicating an important role of this gene in regulation of the airways responsiveness and response to treatment.

**Key words:** COPD, ADRB2 gene polymorphism.