**Abstract**

**Aim**

To examine the association of the polymorphic variants of the -455 T>C, -482 C>T; 3238 C>G in the APOC3 gene; R219K G>A in the ABCA1 gene; L55M A>T and Q192R A>G in the PON1 gene, and indicators of the central nervous system (CNS) in patients of European race with chronic heart failure (CHF) of ischaemic origin.

**Materials and methods**

54 patients with CHF of ischaemic origin, who were no older than 65 years and had no other related diseases and conditions that could be a cause of pathology of the brain, had numerous tests and examinations. These included a physical examination; magnetic resonance imaging (MRI) of the brain; an assessment of cognitive functions by means of Wechsler’s 5 and 7 subtests; proofreading Bourdon’s test; mini mental state examination (MMSE); genetic polymorphism analysis of the -455 T>C, -482 C>T, 3238 C>G in the APOC3 gene; R219K G>A in the ABCA1 gene; and, L55M A>T and Q192R A>G in the PON1 gene.

**Results**

There were no significant differences in the results of the cognitive assessment and the state of the brain deter-mined by MRI, depending on the R219K G>A polymorphism in the ABCE1 gene and 3238C>G polymorphism in the APOC3 gene. The AA genotype of the L55M A>T polymorphism in the PON1 gene, AA genotype of the Q192R A>G polymorphism in the PON1 gene, the presence of C allele of the -455 T>C polymorphism in the APOC3 gene, and T allele of the -482 C>T polymorphism in the APOC3 gene is associated with better cognitive functions in patients with CHF of ischaemic origin. Atrophic changes in the brain in patients with CHF, within the context of coronary artery disease (CAD), are associated with the CC genotype of the -482 C>T polymorphism in the APOC3 gene and G allele of the Q192R A>G polymorphism in the PON1 gene.

**Conclusion**

Determining the polymorphic variants of the -455 T>C in the APOC3 gene, -482 C>T in the APOC3 gene, Q192R A>G and L55M A>T in the PON1 gene can be effective for predicting the development of atrophic changes in the brain and cognitive dysfunction in patients with CHF of ischaemic origin.

**Keywords**

Chronic heart failure, coronary artery disease, cognitive functions, genetic polymorphism.