

Significance of Apolipoprotein E (APOE) and Fat Mass and Obesity-Associated FTO Gene Polymorphisms in Cardiac Autonomic Neuropathy Among Individuals of Kazakh Nationality

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Abstract : Cardiac autonomic neuropathy is not always detected in diabetes, and its phenotypic manifestations may not be evident. Therefore, the study of genetic markers predisposing to the disease is gaining increasing relevance. Research Objective: The goal is to investigate the association of polymorphisms in the APOE and FTO genes with cardiac autonomic neuropathy among individuals of Kazakh nationality. Materials and Methods: A case-control study included 147 patients with cardiac autonomic neuropathy (cases) and 153 patients without cardiac autonomic neuropathy (controls). 300 individuals of Kazakh nationality were recruited from a hospital affiliated with the RSE 'Medical Centre Hospital of the President's Affairs Administration of the Republic of Kazakhstan.' Patients were genotyped for 5 FTO gene polymorphisms (rs17817449, rs1121980, rs11075995, rs9939609, rs12149832) and 2 APOE gene polymorphisms (rs429358, rs7412) using real-time PCR. Statistical analysis involved Chi-square methods and calculation of odds ratios (OR) with 95% confidence intervals (CI) and was performed using the Gen Expert genetic calculator. Results. Our research revealed an association between cardiac autonomic neuropathy and rs12149832 (FTO) and rs429358 (APOE). The AA genotype of the rs12149832 polymorphism was found to double the risk of neuropathy development, while the GA genotype decreased the risk of autonomic neuropathy (2.21 (1.38-3.52) and 0.61 (0.38-0.96), respectively, $p=0.003$). Additionally, we identified that the TC genotype of rs429358 predisposes individuals to the development of cardiac autonomic neuropathy, while the CC genotype decreases the risk (2.23 (1.18-4.22) and 0.26 (0.03-2.31), respectively). Conclusion. Thus, polymorphisms in the APOE and FTO genes (rs429358 and rs12149832) are associated with a predisposition to cardiac autonomic neuropathy and may play a significant role in the pathogenesis of the disease. Further research with a larger sample size and an assessment of their impact on the phenotype is necessary.

Keywords : polymorphisms, APOE gene, FTO gene, automatic neuropathy, Kazakh population.

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