Analysis of apolipoprotein E genetic variation in patients with Alzheimer disease referred to Imam Reza Clinic, Rasht, Iran, in 2016

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Abstract

Background

Alzheimer disease (AD) is a progressive neurological degenerative disorder and the most common form of dementia. There are about 100 genes linked to AD including apolipoprotein E (ApoE). This gene exists in the form of three allele polymorphisms of ε2, ε3 and ε4 and six genotypes of ε2ε3, ε2ε2, ε3ε3, ε2ε4, ε3ε4, and ε4ε4. We aimed to study the association of ApoE polymorphism with AD in Guilan province, Iran.

Methods:

The study group consisted of 70 AD patients and 100 healthy individuals as a control group. All subjects were recruited from 21 March to 22 September 2015 at Imam Reza Clinic, Rasht, Iran. The genomic deoxyribonucleic acid (DNA) was extracted from peripheral blood leukocytes, and subsequently, subjects were genotyped for ApoE using tetra-primer amplification refractory mutation system-polymerase chain reaction (ARMS-PCR). The association between the risk allele and AD was assessed using the MedCalc software.

Results: The distributions of ε3ε3, ε3ε4, ε2ε3, ε2ε4, ε4ε4 and ε4ε4 Genotypes among patients were 55.7%, 30.0%, 1.4%, 2.9%, 8.6%, 1.4% and in the controls were 79.0%, 8.0%, 0%, 1.0%, 1.0%, and 11.0%, respectively. The genotype frequencies were significantly different between cases and the controls (P < 0.001). The individuals with the ε4ε4 and ε3ε4 genotypes had a greater risk for AD as compared to others; odds ratio (OR) = 12.15, 95% confidence interval (CI): 4.1-104.5, P = 0.020; OR = 5.32, 95% CI: 2.16-13.08, P = 0.003. In addition, the ε4 allele is significantly associated with higher AD risk among the studied population (OR = 5.63, 95% CI: 2.74-11.58, P < 0.001).

Conclusion:

This case-control study suggests that the subjects with ε4ε4 and ε3ε4 genotypes

Keywords:

Alzheimer Disease; Apolipoprotein E; Genetic Variation