

APOE Gene Expression in Patients with Alzheimer's Disease

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Abstract: Alzheimer's disease (AD), is a chronic neurodegenerative disease that usually starts slowly and gets worse over time. APOE is a lipoprotein in the brain that is involved in the transport of lipids and especially cholesterol and three alleles of ApoE4 is the strongest genetic risk factor for late-onset Alzheimer's disease. The aim of this study was to investigate APOE gene expression in patients with late-onset Alzheimer's disease. In this study 50 patients with Alzheimer's disease and 57 healthy subjects participated. Blood samples were collected and DNA extraction was carried out. Finally PCR method was used for investigating APOE gene expression in patients with Alzheimer's. Data were analyzed using ANOVA. The results showed that allele 4ε was significantly higher in patients with Alzheimer compared with healthy subjects. According to our findings the presence of the APOE ε4 allele is associated with increased risk for Alzheimer's in Iranian population.

Keywords: APOE, Alzheimer's disease.

1. Introduction

Alzheimer's disease (AD), is a chronic neurodegenerative disease that usually starts slowly and gets worse over time. It is the cause of 60% to 70% of cases of dementia. The cause of Alzheimer's disease is poorly understood. About 70% of the risk is believed to be genetic with many genes usually involved. Other risk factors include a history of head injuries, depression, or hypertension. The disease process is associated with plaques and tangles in the brain. No treatments stop or reverse its progression, though some may temporarily improve symptoms. In 2015, there were approximately 48 million people worldwide with AD. It most often begins in people over 65 years of age, although 4% to 5% of cases are early-onset Alzheimer's which begin before this. It affects about 6% of people 65 years and older In 2010, dementia resulted in about 486,000 deaths.

Clinically, Alzheimer's disease, cognitive disorders, language disorders, motor skills and behavioral changes associated.

Several genes have been associated with Alzheimer's disease. Among the most important Prsynyl 1 on chromosome 14, Prsynyl 2 on chromosome 1 and the leading beta-amyloid proteins on chromosome 21 can be named.

APOE is a lipoprotein in the brain that is involved in the transport of lipids and especially cholesterol and three alleles of ApoE4 is the strongest genetic risk factor for late-onset Alzheimer's disease [1]-[7].

2. Material and Method

The research method was descriptive-cross case-serries. In this study 50 patients with Alzheimer's disease and 57 healthy subjects participated. Blood samples were collected and DNA extraction was carried out. Finally PCR method was used for investigating APOE gene expression in patients with Alzheimer's. Data were analyzed using ANOVA.

3. Results

Alleles of the polymorphism 429358rs and 7412rs were compared between 50 patients and 57 healthy subjects. The results showed that allele 4ε was significantly higher in patients with Alzheimer compared with healthy subjects.

4. Discussion

Alzheimer's is the most common cause of dementia in adulthood and old age [2],[3]. The disease is a leading cause of death in developing countries [8]. Apolipoprotein E (ApoE) is a major cholesterol carrier that supports lipid transport and injury repair in the brain. *APOE* polymorphic alleles are the main genetic determinants of Alzheimer disease (AD) risk. Individuals carrying the ε4 allele are at increased risk of AD. Presence of the *APOE* ε4 allele is also associated with increased risk for cerebral amyloid angiopathy and age-related cognitive decline during normal ageing. ApoE isoforms differentially regulate Aβ aggregation and clearance in the brain, and have distinct functions in regulating brain lipid transport, glucose metabolism, neuronal signalling, neuroinflammation, and mitochondrial function [9],[10].

5. Conclusion

Presence of the *APOE* ε4 allele is associated with increased risk for Alzheimer's in Iranian population.

6. Acknowledgment

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