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Apolipoprotein E Genotypes in Alzheimer's Disease in Central Algerian Population

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Abstract:

Background: Alzheimer's disease (AD) is a progressive and fatal neurodegenerative disorder associated with cognitive decline and is the most common form of dementia in the elderly. Early-onset familial AD accounts for less than 1% of AD cases and develops before the age of 65 years because of mutations in either the APP gene or genes encoding presenilin 1 (PSEN1) or presenilin 2 (PSEN2). The majority of sporadic AD cases are referred to as late-onset AD (LOAD) because they occur late in life (>65 years). Apolipoprotein E (APOE) polymorphic alleles are the major genetic risk factor for AD. The human APOE gene exists as three polymorphic alleles, ε2, ε3, and ε4, with a worldwide frequency of 8%, 78%, and 13%, respectively, with ε4 reaching frequencies of 40% in AD patients. The purpose of this preliminary study was to determine ApoE genotype status since no previous association studies between LOAD and ApoE gene were available for the Central Algerian population.

Methods: The cohort of our study was composed of 47 AD patients recruited from the Neurology Department of Frantz Fanon Hospital of Blida. Forty-seven controls with no type of dementia were also included in the study. All samples were genotyped for the ApoE Polymorphisms by PCR-RFLP method. Statistical studies can use the Fisher exact test or Chi-2 using the GraphPad Prism 7.0 software.

Results: The results show that the genotype ε3/ε3 is most common in both groups followed by the heterozygous genotype ε3/ε4 which showed an increased frequency in patients compared to controls (27.66% vs. 12.77%, OR=3.66, IC=0.89-7.9, p=0,11). Although rare, all other possible genotypes have been observed in our cohort, namely ε2/ε2, ε2/ε3, ε2/ε4 and ε4/ε4. The ε2/ε4 genotype was observed only in AD patients, while the ε2/ε2 genotype was observed only in controls. As expected, the homozygous genotype ε4/ε4 was more frequent in AD patients, compared to controls (6.38% vs. 2.13%, respectively OR=2.64, IC=0.36-37.33; p=0,33). At the allelic level, ε4 allele was significantly associated with AD compared to controls (21,28% vs. 4,26% ; OR= 2.75, 95% CI= 1.109-6.35; p = 0.02, respectively), while the ε2 allele seems to be protective (4,26% vs. 9,57%, OR = 0.49 ; 95% CI=0.14-1.66 ; p=0,38, respectively), but without statistical significance. In population-based studies, the ApoEε4-AD association was weaker among African Americans (ε4/ε4, OR 5.7) and Hispanics (ε4/ε4, OR 2.2) and was stronger in the Japanese population (ε4/ε4, OR 33.1) compared with Caucasian cases (ε4/ε4, OR 12.5). The results obtained in our

preliminary study indicate that the ApoEε4-AD association in the Central Algerian population is similar to that observed in the Mediterranean populations.
Conclusion: We have presented, for the first time in the North Central Algerian population, the association of the ε4 allele with AD, which could be of great use in the diagnosis but also the follow-up of patients with this disease.

Keywords: Alzheimer's Disease, Apolipoprotein E, APOE Gene, ε4 Allele.

13. Declaration of conflicts

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14. Authors' Biography

No biography

15. References

No references