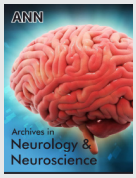

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Mini Review Article

Association of APOE Polymorphism with Stroke in North Indian Population

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Introduction

Stroke is the second most frequent cause of mortality and disability worldwide with two thirds strokes occurring in individuals older than 65 years of age. It is a multifactorial disease with hetrogenous etiopathogenesis. Various studies show that the human apolipoprotein E (ApoE) may have an impact on stroke occurrence which is substantiated by the fact that there is strong correlation between APOE genotyping with cholesterol metabolism, atherosclerosis, ischemic heart diseases, cerebral amylod angiopathy and stroke. ApoE gene is located on chromosome 19 coding for apoliporotein E. It is present in three isoforms: ApoE2, ApoE3 and ApoE4 with six genotypes E2/2, E2/3, E2/4, E3/3, E3/4 and E4/4. On this back ground the present study was taken up to find out the distribution various ApoE genotype in stroke and association of ApoE4 with stroke. Methodology: A cross-sectional study was performed on non diseased and diseased subjects with stroke from outpatient services of Neurology department of Institute of Human Behavior & Allied Sciences (IHBAS), New Delhi (India). All the subjects with acute onset of persistent neurological deficit were diagnosed as stroke, confirmed by neuroimaging (CT/MRI), whereas in control group subjects included were attending the department of Neurology in same hospital for illness other than stroke and without any memory complaints. The patients of head injury presenting with stroke were excluded. APOE genotyping was done in all subjects by PCR-RFLP method [1].

Results

In stroke group, there were 112 subjects (Mean age 57.61 ± 15.21 years; 41 females & 71 males), and control group had 113 patients (mean age: 57.45 ± 14.25 years; 49 females & 64 males). Genetic analysis performed to identify the frequency of six possible ApoE genotypes among diseased and non diseased subjects. The ApoE3/3 genotype was most predominant genotype in both groups, whereas ApoE3/4 had second most frequency of occurring in stroke group (13.4%) and Control group (10.60%). No subject in stroke group had ApoE4/4. However 01 subject in control group had ApoE4/4/ (Table 1). ApoE4 allele was present in 17 subjects in stroke as compared to 13 subjects in control group. Association study showed that ApoE4 allele as risk factor (AOR=1.36; 95% CI: 0.63 - 2.96), showing a weak association [2] (Table 1 & 2).

Table 1: Comparison of age, gender and APOE Genotyping between Stroke & Non-diseased subjects.

Variables	Diagnosis		Cramer's V	p-value
	Stroke(n=112)	Non-diseased (n =113)		
Age (mean, SD)	57.61, 15.21	57.45, 14.25	--	0.94
Gender				
Male	63.40%	56.60%	0.07	0.3
Female	36.60%	43.40%		
AOPE Genotyping				
e2e3	15.20%	8.80%	0.16	0.2
e2e4	1.80%	0.00%		
e3e3	69.60%	79.60%		
e3e4	13.40%	10.60%		
e4e4	0.00%	0.90%		

Table 2: Association of ApoE4 allele with stroke.

Variables	AOR (95% CI)	Disease Status		AOR (95% CI)
		Diseased (Stroke) (n= 112)	Non-diseased (n= 113)	
APOE4 Genotyping				
Present	3.07	17	13	1.36
Absent	(1.39 – 6.78)	95	100	(0.63 - 2.96)
Gender				
Male	0.82	71	64	1.32
Female	(0.45 - 1.48)	41	49	(0.77 – 2.62)
Age (Mean, SD)	1.07 (1.04 – 1.10)	57.61, 15.21	57.45, 14.25	1(0.98 – 1.02)

Discussion and Conclusion

The genetic contribution in stroke is polygenic. However, very few studies have been taken up to study the role of ApoE variation in development of stroke [3]. Luthra et al 2002 and Ganaie et al 2020 examined the association of ApoE gene polymorphism with stroke in Indian population. The present study, ApoE4 allele showed 1.32 fold odds for developing stroke. Similar findings have been reported by Ganaie et al. who also reported that ApoE4 allele had 2.74 fold odds for developing ischemic stroke in ethnic Bengali population of west Bengal. We have also found that ApoE4 allele has strong association with AD & Other dementias, whereas weak association with Parkinson's disease in our studies. However further studies need to be done to find out the association ApoE4 allele with various neurological diseases.

Acknowledgement

None.

Conflict of Interest

No Conflict of interest.

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