Association of Apolipoprotein E Genotype with Activities of Daily Living After Aneurysmal Subarachnoid Hemorrhage

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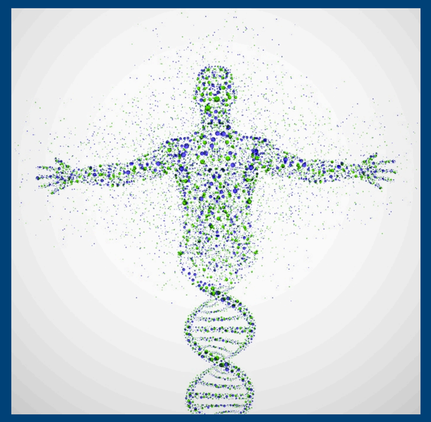
Background

- Aneurysmal subarachnoid hemorrhage (aSAH) affects approximately 30,000 individuals in the US every year[1]
- aSAH has an extremely high mortality rate (up to 50%) and only 60% return to a functional, independent state post-stroke[2,3]
- Apolipoprotein E (apoE) is a protein that facilitates lipid transport and aids in neuronal repair within the CNS (likely candidate to predict functional outcome post-aSAH) and is coded for by the apolipoprotein gene (*APOE)*[4]
- There are three known alleles (E2, E3, and E4) which can be combined to form six different genotypes (*APOE* 2/2, *APOE* 2/3, *APOE* 2/4, *APOE* 3/3, *APOE* 3/4, and *APOE* 4/4)[5]
- E4 allele associated with worse functional outcomes after intracranial hemorrhage and traumatic brain injury, but has no association to functional outcome in ischemic stroke and aSAH [6,7,8, 13]
- Ability to perform activities of daily living (ADLs) is a significant indicator of quality of life and independence post-stroke[9]
- A significant association between the presence of allele E4 and ability to perform ADLs has previously been shown in a mild-cognitive impairment population[10,11]
- The relationship between the presence of E4 allele and ability to perform ADLs post-aSAH has not been previously explored

Purpose

- The purpose of this study was to examine the relationship between *APOE* genotype and ability to perform ADLs in persons with aSAH



Population

- Subjects were prospectively recruited as part of an ongoing NIH-funded study approved by the IRB
- Patients were included in the study if they were
  - Between the age of 18 and 75 years old
  - Diagnosed with aSAH verified with cerebral angiogram
  - Able to read/speak English
  - Had no previous history of neurological disorders

Population Characteristics (n=382)	
Gender	Female 69.9%, n=267
Race	White 89%, n=340
Hunt and Hess (HH) Score	Mean 2.65

Methods

- Genotypes were classified based on the presence or absence of at least one *APOE* E4 allele
- Ability to perform ADLs was evaluated via home visit 3 and 12 months post-aSAH using Barthel Index (BI) score
- BI score calculates a composite measure of ability to perform ADLs including functions such as toileting, dressing, mobility, transfer, and grooming, among others
- Multivariate linear regression was performed to determine the relationship between *APOE* genotype and outcome variability in BI scores controlling for age, sex, and severity of clinical condition (HH score)

Results

- No significant association was found between *APOE* genotype and BI score at 3 and 12 months post-aSAH (p=0.88 and p=0.95)
- A significant association was found between HH score and BI score at 3 months (p<0.01), which neared significance at 12 months (p=0.05)

Conclusions

- *APOE* genotype does not appear to have a significant impact on ability to perform ADLs post-aSAH
- These results support findings from Wagle et. al (2010) who found no significant relationship between *APOE* genotype and ability to perform ADLs after ischemic and hemorrhagic stroke[12]
- HH score does appear to have an association with ability to perform ADLs, which supports existing literature suggesting initial clinical condition is a significant predictor of functional outcome
- We are in the process of adding more subjects to the analysis
- Results from this study adds to the mixed evidence regarding the relationship between *APOE* genotype and functional outcome post-aSAH, warranting a need for further exploration of genotype as a predictor of outcome variability

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