



APOE Genotype Affects Outcome After Subarachnoid Hemorrhage

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Introduction

Apolipoprotein E (ApoE) levels in the brain increase after neurological injury. Prior studies have demonstrated that patients harboring ApoE4 allele are at an increased risk for poor outcome after aneurysmal subarachnoid hemorrhage (SAH) (Ref 1). However, the mechanism by which ApoE genotype influences outcome after SAH is unclear. While animal studies have suggested an effect of ApoE genotype on cerebral vasospasm (one of the main contributing factors to poor outcome after SAH), human data is lacking (Ref 2). The aim of this study was to assess the effect of ApoE genotype on vasospasm and neurological outcome after SAH.

Methods

We conducted a prospective observational cohort study of patients with aneurysmal SAH. Primary endpoint was angiographic vasospasm (assessed by catheter angiogram). Secondary endpoints included symptomatic vasospasm, functional outcome (assessed by Rankin Disability Index), and cognitive outcome (assessed by Mini Mental Status Examination). ApoE genotype was determined using polymerase-chain reaction. Physicians were blinded to patient genotype. Univariate and multivariate analysis was performed to identify risk factors for various endpoints.

Results

186 patients were included in the study. Angiographic vasospasm was seen in 138 (74%) patients, while 64 (35%) patients developed symptomatic vasospasm. Presence of ApoE4 allele was a significant, independent risk factor for poor cognitive outcome on multivariate analysis. However, ApoE genotype was not a significant risk factor for angiographic vasospasm, symptomatic vasospasm or functional morbidity on univariate and multivariate analyses.

Conclusions

Patients with an ApoE4 allele have worse cognitive outcome after SAH. The effect of ApoE genotype on cognitive outcome after SAH is through processes other than angiographic or symptomatic vasospasm.

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Learning Objectives

By the conclusion of this session, participants should be able to

understand the role of Apolipoprotein E on vasospasm and clinical outcome after subarachnoid hemorrhage

References

1. Lanterna LA, Ruigrok Y, Alexander S, Tang J, Biroli F, Dunn LT, Poon WS. Meta-analysis of APOE genotype and subarachnoid hemorrhage: clinical outcome and delayed ischemia. Neurology. 2007 Aug 21;69(8):766-75.
2. Wu HT, Zhang XD, Su H, Jiang Y, Zhou S, Sun XC.Association of apolipoprotein E polymorphisms with cerebral vasospasm after spontaneous subarachnoid hemorrhage. Acta Neurochir Suppl. 2011;110(Pt 1):141-4.