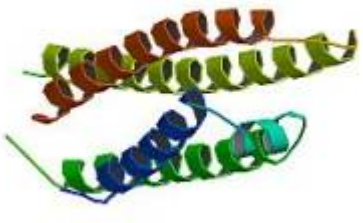
# Apolipoprotein E4



Apolipoprotein E (ApoE) is a glycoprotein with a major role in brain lipoprotein metabolism. It has three isoforms encoded by distinct alleles: APOEε2, APOEε3 and APOEε4.

Risk factors for Dementia: advanced age, family history of dementia, and apolipoprotein E-4 allele.

The presence of this genotype portends a worse prognosis following traumatic brain injury [1)]

Furthermore, the incidence of severe traumatic brain injury in individuals with the apoE-4 allele greatly exceeds the rate of the allele in the general population [2)]. This allele is also a risk factor for Alzheimer's disease [3) 4) 5)] as well as for chronic traumatic encephalopathy.

Among patients with lobar hemorrhage, those with the apoE ε4 allele typically have their first hemorrhage >5 yrs earlier than noncarriers (73 ± 8 yrs vs./ 79 ± 7 yrs) [6)].

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Findings suggested that APOEε4 allele is a risk factor to brain function aggravation in the early stage of aneurysmal subarachnoid hemorrhage, and it may contribute to early brain injury after SAH [7)].

Finding also suggests that the patients with APOEε4 allele predispose to cerebral vasospasm after spontaneous SAH [8)].

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The presence of APOE ε4, an elevated international normalized ratio, and a higher glucose level (≥ 10 mmol/L) are predictors of progressive traumatic intracerebral hemorrhage. Additionally, APOE ε4 is not associated with traumatic coagulopathy and patient outcome [9)].

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APOE ε4 and ε2 alleles appear to affect lobar ICH risk variably by race/ethnicity, associations that are confirmed in white individuals but can be shown in Hispanic individuals only when the excess burden of hypertension is propensity score-matched; further studies are needed to explore the interactions between APOE alleles and environmental exposures that vary by race/ethnicity in representative populations at risk for ICH [10)].

APOEε4 may induce cerebral perfusion impairment in the early phase, contributing to early brain

injury (EBI) following aneurysmal subarachnoid hemorrhage (aSAH), and assessment of APOE genotypes could serve as a useful tool in the prognostic evaluation and therapeutic management of aSAH [11].

The APOEε4 polymorphism was analysed in 147 patients with aSAH. Allele and genotype frequencies were compared to those found in a gender- and area-matched control group of healthy individuals (n = 211). Early cerebral vasospasm (CVS) was identified and treated according to neurointensive care unit (NICU) guidelines. Neurological deficit(s) at admittance and at 1-year follow-up visit was recorded. Neurological outcome was assessed by the National Institute of Health Stroke Scale, Barthel Index and the Extended Glasgow Outcome Scale.

APOEε4 and non-APOEε4 allele frequencies were similar in aSAH patients and healthy individuals. The presence of APOEε4 was not associated with the development of early CVS. We could not find an influence of the APOE polymorphism on 1-year neurological outcome between groups. Subgroup analyses of patients treated with surgical clipping vs endovascular coiling did not reveal any associations.

The APOEε4 polymorphism has no major influence on risk of aSAH, the occurrence of CVS or long-term neurological outcome after aSAH [12].

# References

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