Apolipoprotein ε4 is Associated with Dementia and Cognitive Impairment Predominantly Due to Alzheimer’s Disease and Not with Vascular Cognitive Impairment: A Singapore-Based Cohort

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Abstract.

Background and Objective: While the association for apolipoprotein ε4 allele (APOE4) with Alzheimer’s disease (AD) has been consistently confirmed, the association with vascular cognitive impairment (VCI) is unclear. We therefore explored the relationship of APOE with both AD and cerebrovascular disease (CeVD) by examining the prevalence of APOE4 in AD, AD with CeVD and vascular dementia (VaD), as well as in cognitive impairment no dementia (CIND) with and without CeVD.

Methods: We performed a case-control study with subjects recruited from memory clinics and the community. All subjects underwent standardized brain neuroimaging, clinical and neuropsychological assessments, following which they were classified using research criteria.

Results: A total of 411 subjects; 92 controls with no cognitive impairment (NCI), 77 CIND without CeVD, 87 CIND with CeVD, 55 AD without CeVD, 68 AD with CeVD, and 32 VaD patients were recruited. Compared to NCI (16.3%), the prevalence of APOE4 carriers was significantly higher only in CIND (37.7%) and AD in the absence of CeVD (45.5%), but not in the three subgroups of VCI, namely CIND with CeVD (20.7%), AD with CeVD (27.9%) and VaD (25.0%). Logistic regression analyses also showed that APOE4 carriers were more likely to have CIND without CeVD (Odds Ratio [OR]: 3.34; 95% Confidence Interval [CI]: 1.59–7.03) and AD without CeVD (OR: 7.21; 95% CI: 2.74–18.98), but no such association was observed in the VCI subgroups.

Conclusion: APOE4 is significantly associated with dementia and CIND due to AD pathology, but not with VCI.

Keywords: Alzheimer’s disease, apolipoprotein ε4, cerebrovascular disease, cognitive impairment no dementia, vascular cognitive impairment, vascular dementia

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