

Study examines association between small-vessel disease, Alzheimer pathology

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Cerebral small-vessel disease (SVD) and Alzheimer disease (AD) pathology appear to be associated.

AD is believed to be caused by the buildup of [amyloid protein](#) in the brain and tau tangles. Previous studies have suggested that SVD and [vascular risk factors](#) increase the risk of developing AD. In both SVD and [vascular dementia](#) (VaD), signs of AD pathology have been seen. But it remains unclear how the interaction between SVD and AD pathology leads to dementia.

Authors examined the association between SVD and AD pathology by looking at [magnetic resonance imaging](#) (MRI)-based microbleeds (MB), [white matter hyperintensities](#) (WMH) and lacunes (which are measures for SVD) along with certain protein levels in cerebrospinal fluid (CSF) which reflect AD pathophysiology in patients with AD, VaD and healthy control patients. The authors also examined the relationship of apolipoprotein E (APOE) $\epsilon 4$ genotype, a well-known risk factor for AD.

The presence of both MBs and WMH was associated with lower CSF levels of $A\beta 42$, suggesting a direct relationship between SVD and AD. Amyloid deposits also appear to be abnormal in patients with SVD, especially in (APOE) $\epsilon 4$ carriers.

"Our study supports the hypothesis that the pathways of SVD and AD pathology are interconnected. Small-vessel disease could provoke amyloid pathology while AD-associated cerebral amyloid pathology may

lead to auxiliary vascular damage." Maartje I. Kester, M.D., Ph.D., of the VU University Medical Center, Amsterdam, the Netherlands, and colleagues wrote in their JAMA Neurology paper.

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