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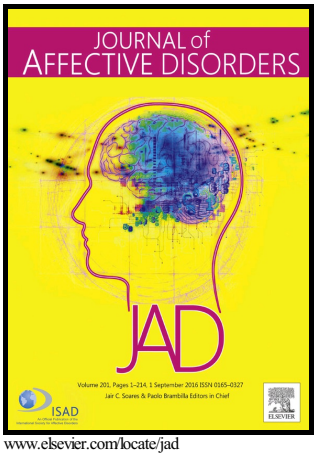

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Involvement of the reward network is associated with apathy in cerebral small vessel disease

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Abbreviation; SVD, small vessel disease; MRI, magnetic resonance imaging; WMH, white matter hyperintensities; DTI, diffusion tensor imaging; VTA, ventral tagmental area; SCANS, St George's Cognition and Neuroimaging in Stroke; GDS, Geriatric Depression Scale; SPGR, spoiled gradient recalled echo; FSL, FMRIB Software Library; AAL, Automated Anatomical Labelling

Abstract

Introduction–

Apathy is a common yet under-recognised feature of cerebral small vessel disease (SVD), but its underlying neurobiological basis is not yet understood. We hypothesized that damage to the reward network is associated with an increase of apathy in patients with SVD.

Methods–

In 114 participants with symptomatic SVD, defined as a magnetic resonance imaging confirmed lacunar stroke and confluent white matter hyperintensities, we used diffusion tensor imaging tractography to derive structural brain networks and graph theory to determine network efficiency. We determined which parts of the network correlated with apathy symptoms. We tested whether apathy was selectively associated with involvement of the reward network, compared with two "control networks" (visual and motor).