Cerebral small vessel disease and vascular Parkinsonism and motor dysfunction

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Cerebral small vessel disease (SVD) is a frequent finding on brain imaging of the elderly population and has been identified as a cause of motor impairment and gait and balance decline over time. SVD has also been related to parkinsonism, with evidence mainly coming from cross-sectional autopsy studies that found pathological proof of SVD in patients with parkinsonism, without pathological evidence of suggestive if idiopathic parkinsonism, including Lewy bodies or tau inclusions.

The magnetic resonance imaging (MRI) spectrum of SVD is rapidly expanding from lesions visible on conventional MRI, including white matter hyperintensities (WMHs) and lacunes of presumed vascular origin, microbleeds, and (sub)cortical atrophy, to changes in diffusion measures of the white matter (WM) assessed by diffusion tensor imaging (DTI), which is regarded as an index of WM structural integrity.

Whether parkinsonism is a direct consequence of SVD or just a coincidental finding is unknown as recent DTI studies have shown a relation between diffusion abnormalities in the WM and parkinsonism. However, the cross sectional nature of these studies prevents causal inference. A recent longitudinal study, investigating the role of the different imaging characteristics of SVD, including DTI measures, in the development of parkinsonism have showed that WMH, microbleeds and a lower structural integrity increase the risk for incident VaPD, in patients free of the disease at study entry.

During the presentation I will further review and discuss these studies and address areas for future research in the field of SVD and (vascular) parkinsonism.