Hippocampal volumetry in mild cognitive impairment

Akademisk avhandling

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Dementia is a syndrome with cognitive decline as a prominent feature. MCI is similarly a syndrome of cognitive decline, albeit with much subtler symptoms, and has been identified as a condition at risk for progression to dementia. A considerable clinical challenge lies in identifying MCI patients with an underlying dementia disorder. The overall aim of this thesis is to examine hippocampal volume in MCI with regard to prognostics.

Alzheimer’s disease (AD) and vascular dementia are the two most important causes of dementia. Subcortical ischemic vascular dementia (SIVD), characterized by white matter lesions (WMLs), is considered the most important cause of vascular dementia in the elderly. Hippocampal atrophy has been identified as a common feature of AD and increasing evidence suggests that hippocampal atrophy is present in SIVD as well.

It was found that MCI patients subsequently converting to dementia have smaller hippocampi than stable MCI patients. Hippocampal volume seems to be a useful marker in MCI patients with different underlying disorders. It can therefore be argued that hippocampal volume may be viewed as a broad cognitive marker. Hippocampal volume was also found to supplement the prognostic ability of CSF Aβ42 and T-tau in MCI. Furthermore, measurement of WML shows that WML volume is related to hippocampal volume in patients with high WML burden, suggesting that WMLs may be involved in the development of hippocampal atrophy in SIVD. Left hippocampal volume was consistently a better prognostic marker than right hippocampal volume. When evaluating their respective association with psychometric test performance, the left hippocampus was found to be more closely related to test performance.

Key words: Mild cognitive impairment, dementia, Alzheimer’s disease, vascular dementia, MRI, hippocampus, white matter lesions, CSF biomarkers, neuropsychology