REGIONAL WHITE MATTER TRACT CHANGES IN ATTENTION/EXECUTIVE DEFICIT MILD COGNITIVE IMPAIRMENT

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Introduction: Mild cognitive impairment (MCI) subjects may have impairment in multiple neuropsychological domains. Attention/executive deficits may occur in Alzheimer's disease (AD), but may also be caused by other types of pathology. Amnestic MCI often represents pre-dementia AD and is characterized by medial temporal lobe affection, but attention/executive deficit MCI (a/eMCI) has been less studied.

Aims: To analyze how attention/executive impairment is related to white matter (WM) tract and cortical changes. Our hypothesis is that executive impairment is related to frontal lobe changes.

Methods: We included 23 nonamnestic a/eMCI patients (MMSE 28.0: 25-30, age 61.3: 45-73, education 12.3: 8-18) and 23 normal controls (MMSE 29.4: 28-30, age 63.2: 48-78, education 12.1: 8-16), who underwent neuropsychological and MRI examinations. To be classified as a/eMCI, a score 1.3 SD below the control mean on at least two attention and/or executive parameters and normal score on at least two memory parameters were required. Morphometric analysis was performed in FreeSurfer and Tract-Based Spatial Statistics was used for analysis of DTI derived WM radial diffusion (DR).

Results: WM DR, underlying the medial orbitofrontal, cingulate and entorhinal cortices, were higher (Student's t-test; p< 0.05) in a/eMCI compared to controls, whereas no significant differences were found for the morphometric measurements. WM DR, underlying medial/lateral orbitofrontal, superior frontal, rostral middle frontal and cingulate cortices, correlated negatively with inhibition and inhibition/switching performance (p< 0.05) in a/eMCI, but no significant relations were found in controls.

Conclusion: Executive dysfunction is related to specific WM tract degeneration in frontal and cingulate regions.