WHITE MATTER 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, including executive function. Brain changes in patients with amnestic MCI are related to affection of the medial temporal lobe and increased Alzheimer’s dementia risk, attention/executive deficit (a/e) MCI is less studied and may represent either early manifestations of Alzheimer’s disease or other types of pathology.

Aims: To identify white matter (WM) tract and cortical changes accompanying a/eMCI.

Methods: We included 23 non-amnestic patients with a/eMCI (MMSE 28.0: 25-30 age 61.3: 45-73) and 23 normal controls (MMSE 29.4: 28-30, age 63.2: 48-78). Participants underwent neuropsychological assessment. To be classified as a/eMCI, a score of 1.3 SD below the control mean on at least two attention and/or executive parameters and normal scores on at least two memory parameters were required.

Morphometric analysis was performed in FreeSurfer, and Tract-Based Spatial Statistics (TBSS) was used for analysis of DTI derived WM radial diffusion with subsequent whole-brain voxelwise statistics using threshold-free cluster enhancement (TFCE). The FreeSurfer parcellation algorithm was then employed to assess predilection sites for WM tract changes.

Results: Widespread WM tract degeneration was demonstrated. To target the areas with more marked changes, the significance level was set at 0.01 (corrected for multiple comparisons). The most marked changes were seen in the temporal and frontal lobes, with less prominent changes in the parietal and occipital lobes. Cortical thickness group differences were not found.

Conclusion: Predominantly temporal and frontal WM tract degeneration is detectable in a/eMCI patients without corresponding cortical atrophy.