HIPPOCAMPAL SHAPE DIFFERENCES IN SUBTYPES OF FRONTOTEMPORAL LOBAR DEGENERATION AND ALZHEIMER’S DISEASE

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Introduction: Hippocampal atrophy is evident in frontotemporal lobar degeneration (FTLD) and Alzheimer’s disease (AD). We used a multidimensional classification approach to assess morphological shape differences between 19 AD, 9 progressive nonfluent aphasia (PNFA), 12 frontotemporal dementia (FTD), 13 semantic dementia (SD) patients and 18 controls.

Aim: The purpose of this study was to assess regional shape deformation in hippocampus in AD and in the 3 subtypes of FTLD.

Method: Diagnoses were based on international consensus criteria. Participants were recruited from the Karolinska University Hospital and 1.5 T, 3D T1-weighted MR images were acquired. Manually segmented hippocampal binaries were analyzed using UNC Shape Analysis tools (University of North Carolina) to perform corrected multiple comparisons between groups for global shape, local p-value significance maps, and mean magnitude of shape displacement.

Results: Shape analysis revealed significant (p< 0.05) global shape differences between dementia groups and controls. The degree of shape change was: Greater - AD>SD>PNFA>FTD - Lesser versus controls. FTLD subtypes displayed relatively more atrophy in anterior hippocampus in contrast to greater involvement of the body of hippocampus in AD, compared to controls. The pattern of atrophy in AD shows, on the left, involvement of the hippocampal body, whilst there was only involvement of the head on the right. A left-lateralized pattern of atrophy is evident across all dementia groups.

Conclusion: FTLD subtypes display a differential pattern of hippocampal atrophy to AD. However deformation in the right hippocampus in AD suggests that all dementia types may initially display anterior pathology.