AbstractID: 1123 Title: Medial Temporal Hippocampus Volumetry and Voxel Based Morphometry Study of the Alzheimer's Disease

Alzheimer's disease (AD) is a neurodegenerative disorder characterized by progressive cognitive decline and a wide range of behavioral disturbances. Voxel-based morphometry (VBM) has already been applied to MRI scans of patients with AD. The results of these studies demonstrated atrophy of the hippocampus, temporal pole, and insula, but did not describe any changes of the blood flow or atrophy of deep cerebral structures. We proposed an optimized automatically VBM.

We used the VBM approach to investigate gray matter abnormalities over the entire extension of the temporal lobe in 12AD patients (MMSE 14–25) and 8 healthy controls. Data analysis was performed using statistical parametric mapping (SPM). The image data sets were then subjected to the following automated image registration using mutual information and segmentation steps prior to statistical analysis. In the VBM applied in AD, volumes are registered to MRI and referred to re-slicing, re-sampling and normalization. In the group comparison statistical difference were estimated by detecting whether each voxel probability of being gray matter in the AD and control group.

Foci of significantly reduced gray matter volume in AD patients were detected in both medial and lateral temporal regions, most significantly in the right and left posterior parahippocampal gyri. (P<0.01, uncorrected for multiple comparisons)

These VBM results confirm temporal lobe atrophic changes in AD, and suggest that volumetry is the most sensitive tool for the detection of hippocampal abnormality in AD and significant correlation between asymmetry in hippocampal volume and corresponding in cortex hypoperfusion.