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A voxel based morphometry study in Alzheimer's disease

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Several MRI studies have reported reductions in temporal lobe volumes in Alzheimer's disease (AD). Measures have been usually obtained with regions of interest (ROI) drawn manually on selected medial and lateral portions of the temporal lobes, with variable choices of anatomical borders across different studies. We used the automated voxel based morphometry (VBM) approach to investigate gray matter abnormalities over the entire extension of the temporal lobe in 11 AD patients (MMSE 14 - 25) and 11 healthy controls. 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. At a more flexible statistical threshold (P<0.001, uncorrected for multiple comparisons), circumscribed foci of significant gray matter reduction were also detected in the right amygdala/enthorinal cortex, the anterior and posterior borders of the superior temporal gyrus bilaterally, and the anterior portion of the left middle temporal gyrus. These VBM results confirm previous findings of temporal lobe atrophic changes in AD, and suggest that these abnormalities may be confined to specific sites within that lobe, rather than showing a widespread distribution.

Key words: Alzheimer's Disease, Statistical Parametric Mapping.