Hippocampal Atrophy and Autobiographical Memory in Temporal Lobe Epilepsy: Preliminary Findings.

Donna Rose Addis[1], Morris Moscovitch[2,3], Sandra Black[3,4,5], Fu Qiang Gao[4,5] and Mary Pat McAndrews[2,6]

[1]Department of Psychology, Harvard University, Cambridge, M.A.
[2]Department of Psychology, University of Toronto, Toronto, Ontario
[3]Rotman Research Institute, Baycrest Centre for Geriatric Care, Toronto, Ontario
[4]Sunnybrook and Women's College Health Science Centre, Toronto, Ontario
[5]Division of Neurology, Dept. of Medicine, University of Toronto, Toronto, Ontario
[6]Toronto Western Research Institute, Toronto, Ontario,

Objectives:
The hippocampus has been shown to play a key role in episodic retrieval, particularly for autobiographical memory (AM), but appears less involved in semantic retrieval. Here, we investigated whether the degree of hippocampal atrophy in temporal lobe epilepsy (TLE) correlates with loss of episodic, but not semantic, aspects of AM.

Participants and methods:
Participants included 9 left (LTLE) and 6 right (RTLE) TLE patients (lateralization based on EEG criteria) and 14 age-matched controls. Participants recalled 4 AMs which were transcribed and scored for the number of episodic and semantic details produced. A linear hippocampal width measurement was made on MRI scans at a standardized location on a slice through the long axis of the hippocampus.

Results:
TLE patients showed significant impairments of the episodic, but not the semantic, component of AM. The RTLE group exhibited significant bilateral hippocampal atrophy relative to controls, and those with LTLE showed a trend for atrophy in the left hippocampus. For the TLE patients, we found a significant correlation (controlling for IQ) between the number of AM details and total hippocampal width for episodic AM but this was not evident for the semantic AM.

Conclusions:
This study extends previous work from our group showing that TLE patients exhibit a differential impairment of episodic relative to semantic AM[1] and that the structural integrity of the hippocampus is correlated with the ability to recollect personal experiences.[2]

[1]Gao et al., Neurobiol Aging, 2004
[2]Vikontas et al., J Neuroscience, 2000
[3]Gilboa et al., Hippocampus, 2005