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EDITORIAL COMMENTARIES

The volumes of memory

In 1937, Papez described a circuit for the processing of emotions, which has subsequently proved to be critical for memory function.¹ Various pathological entities can affect structures in this circuit, resulting in amnesic syndromes. In this issue of the *Journal* (pp 13–28), two related papers by Colchester *et al*² and Kopelman *et al*³ used volumetric MR to assess the differing patterns of atrophy in patients with amnesia caused by several neurological diseases, and to examine the relation of these MR volumes to cognitive performance.

A great deal of recent work has focused on detecting atrophy in patients with neurodegenerative dementias, in particular Alzheimer's disease. Recent papers have reported significant atrophy in structures within the medial temporal lobe in memory impaired subjects even before the clinical diagnosis of Alzheimer's disease.^{4–6} Relatively few studies have examined volumes of medial temporal lobe and other memory subserving structures in non-degenerative amnesic syndromes.

The report of Colchester *et al*² suggests that atrophy among the components of the circuit of Papez can be reliably quantified using MR volumetric assessment, and that amnesic syndromes of varying aetiology show specific patterns of atrophy. Of particular interest was the consistent finding of thalamic atrophy in the patients with Korsakoff's syndrome.

Complementing this work, Kopelman *et al*³ examined the correlations between MR volumes of multiple brain regions and performance on several cognitive tests in patients with amnesic and other cognitive syndromes. Of

note, the strongest relations were seen between hippocampal volume and anterograde memory measures, particularly evident in a factor analysis of the neuropsychological tests, although the thalamic measures did correlate with several memory tests.

These studies provide additional evidence for the critical role of the hippocampus in memory, and support the contribution of additional structures within the circuit of Papez to memory function. This work suggests that volumetric MR may be useful in elucidating the pattern of injury to neuroanatomical networks in various cognitive impairment syndromes.

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