APOE and Spatial Navigation in Amnestic MCI: Results From a Computer-Based Test

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Abstract

OBJECTIVE: We investigated the association between APOE ε4 status and spatial navigation in patients with amnestic mild cognitive impairment (aMCI) and assessed the role of hippocampal volume in this association.

METHOD: Participants were 74 patients with clinically confirmed aMCI (33 APOE ε4 noncarriers, 26 heterozygous, and 15 homozygous ε4 carriers). Body-centered (egocentric) and world-centered (allocentric) spatial navigation in a computerized human analogue of the Morris Water Maze was assessed. Brain MRI with subsequent automated hippocampal volumetry was included.

RESULTS: Groups were similar in neuropsychological profile. Controlling for age, sex, education, and free memory recall, the APOE ε4 carriers performed more poorly on all spatial navigation subtasks (ps < .05). APOE ε4 homozygotes performed worse than heterozygotes (p = .021). Right hippocampal volume accounted for the differences in allocentric and delayed subtasks (ps > .05), but
not in the egocentric subtask (p < .001).

CONCLUSIONS: Using an easy-to-use, computer-based tool to assess spatial navigation, we found spatial navigation deficits to worsen in a dose-dependent manner as a function of APOE ε4 status. This was at least partially due to differences in right hippocampal volume.


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