INTRODUCTION

Typical Alzheimer's disease (AD) is characterized by an impaired form of associative memory, recollection, that includes the controlled retrieval of associations.

In contrast, familiarity-based memory for individual items may sometimes be preserved in the early stages of the disease.

Little is known about the brain correlates of controlled retrieval of associations (CAR) and familiarity-based memory in AD patients.

This is the first study that directly examines whole brain regional activity during one core aspect of the recollection function: CAR contrasted to item familiarity in AD patients.

METHODS

Participants: 17 healthy older controls (HC)
26 patients with Alzheimer's disease (AD)

Task: associative memory task

(1) Encoding of unrelated word pairs (n = 103)

(2) Recognition: 3 types of pairs

Data analyses: SPM8, p < .05 corr. for whole brain volume or VOI

RESULTS

3 groups: CAR abilities ≤ 0: AD-, n = 10
CAR abilities > 0: AD+, n = 16
HC: n = 17

In HC and AD+: PCC

Functional interaction with the PCC during CAR in HC > AD:

Hippocampus

In HC, AD+, and AD-:

Inferior parietal

Dorsolateral prefrontal

DISCUSSION

In our AD patients, item familiarity is preserved whereas CAR is severely impaired.

Preserved automatic detection that an item is old (≈ familiarity) is supported by the IPS in AD patients as in HC participants.

Even if AD patients have objectively residual controlled associative retrieval process supported by relatively preserved PCC activation, this process might be qualitatively impaired due to deficient functional connectivity.

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