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Abnormal fMRI response in sub-hippocampal structures in AD: how prior knowledge impairs memory

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INTRODUCTION

- An impairment of associative memory (item + context memory) is a core feature of prodromal Alzheimer’s Disease (AD). Typically, associative memory is assessed with unfamiliar stimuli (e.g., isolated words) within unfamiliar environments. Yet, patients’ complaints refer to memory losses for familiar stimuli within daily routine, namely stimuli carrying prior knowledge.
- Surprisingly though, whether prior knowledge impacts memory performance and the underlying brain networks at encoding is unknown.
- By overlooking Prior Knowledge contribution to learning, we might underestimate the earliest memory impairments in AD.

MATERIAL & METHODS

- Subjects
  - N = 19
  - Group: Healthy controls (Healthy controls), AD-MCI (AD-MCI)
  - Gender: Women (9), Men (10)
  - Age: 61-75
  - 15' & 45'

RESULTS

- Prior knowledge x Repetition
  - Does prior knowledge modulate face-scene encoding networks?
  - Subsequent memory analysis in clusters derived from prior knowledge x Repetition x Group
  - Right hippocampal activity predicts associative memory for EK trials in both groups

CONCLUSION

- Prior knowledge has a massive impact on learning performance and neural encoding networks.
- In the earliest stages of AD, associative learning is particularly impaired for pre-experimental Knowledge stimuli.
- The kind of Prior Knowledge available at encoding dissociates the neural underpinnings of memory formation.
- The perirhinal cortex, that undergoes early tau pathology in AD, is involved in pre-experimental knowledge-based encoding.

By overlooking Prior Knowledge contribution to learning, we might underestimate the earliest memory impairments in AD.

REFERENCES


Perspectives for a new biomarker of AD.