

Abnormal Amygdala–Default Mode Network Functional Connectivity Predicts 10-Year Dementia Progression in Late-Life Depression

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INTRODUCTION

Late-life depression (LLD) is a risk factor for Alzheimer's Disease (AD) dementia. However, whether baseline abnormal functional connectivity (FC) in LLD predicts longitudinal cognitive decline remains unclear.

Brain Regions of Interest

- Amygdala
- Nucleus Accumbens
- Dorsolateral PFC (DLPFC)
- PCC, mPFC

CONCLUSIONS

FC is a clinically relevant biomarker of LLD, predicting longitudinal cognitive decline.

This finding highlights the potential of FC analysis in identifying LLD patients at risk for dementia progression, offering a neurobiological basis for early intervention strategies.

METHODS

Participants

- 66 LLD patients
- 20 age-matched healthy controls (HC)
- 36 LLD patients followed for 10 years:
 - Stable LLD (sLLD): **n = 23**
 - Progressive LLD (pLLD): **n = 13**

Neuroimaging

- Resting-state fMRI (rs-fMRI)

Statistical Analyses

- ANCOVA: between-group FC comparison (controlled for age, sex, education)
- Partial correlation: baseline amygdala–DMN FC vs. GDS scores within LLD
- ANCOVA: amygdala–DMN FC comparison between sLLD and pLLD

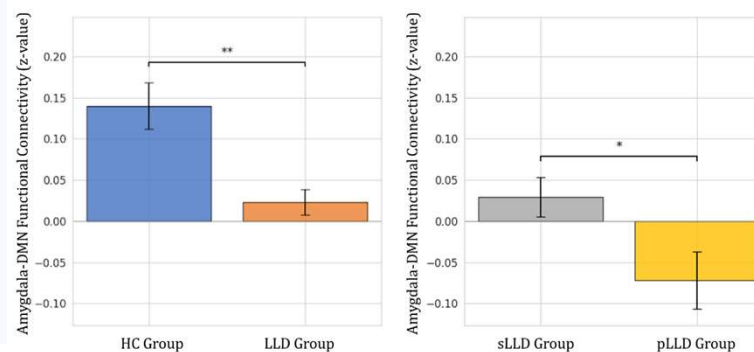


Fig 1. Baseline amygdala–DMN connectivity differentiates groups and predicts decline.

RESULTS

Finding 1 — LLD shows reduced amygdala–DMN FC vs. HC

LLD patients showed significantly lower amygdala–DMN (PCC, mPFC) FC than HC.

F = 7.843, p = 0.007

Finding 2 — FC correlates with depression severity

Lower amygdala–DMN FC correlated with higher GDS scores.

partial r = -0.288, p = 0.039

Finding 3 — FC predicts 10-year dementia progression

The pLLD group showed significantly lower baseline amygdala–DMN FC than sLLD.

F = 4.912, p = 0.040

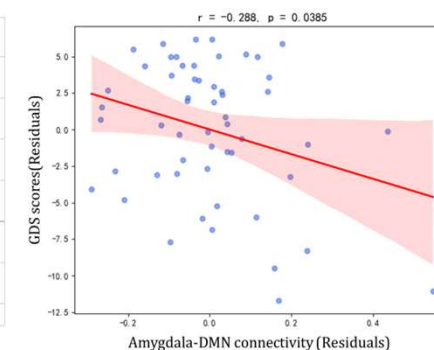


Fig 2. Partial correlation between amygdala–DMN FC and GDS scores.

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