

Mapping Amyloid-PET Uptake in the White Matter in Alzheimer’s Disease

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Background

- White matter (WM) alterations are common features of AD, but their role remains unclear.
- Amyloid-PET shows physiological uptake, potentially reflecting myelin integrity.
- Our study investigates whether **WM measures derived from amyloid-PET** are associated with AD biomarkers and to determine whether they offer added diagnostic and prognostic value beyond established biomarkers.

Methods

320 individuals Memory Clinic, Geneva University Hospitals CU 98 MCI 174 DEM 48

MRI
T1-weighted - WM mask
FLAIR - WMH, normal-appearing WM (NAWM), total lesion volume (TLV), cerebral microbleeds (CMB)

PET
[¹⁸F]flutemetamol - Amyloid (Centiloid)
[¹⁸F]flortaucipir - Global tau SUVR **N = 147**

Plasma biomarkers
Measured markers:
Aβ 42/40 P-tau181 P-tau231 P-tau217 NfL GFAP

Cognitive assessment
Baseline - Mini-mental state examination (MMSE)
Follow-up - Annual change in MMSE **N = 201**

Statistical Analysis

Linear regression analysis

Assess relationship between NAWM and WMH SUVR

- Imaging biomarkers
- Plasma biomarkers
- Cognitive performance
- Annual change in MMSE

Linear-mixed models

Association between imaging markers and cognitive outcomes (MMSE and annual change in MMSE)

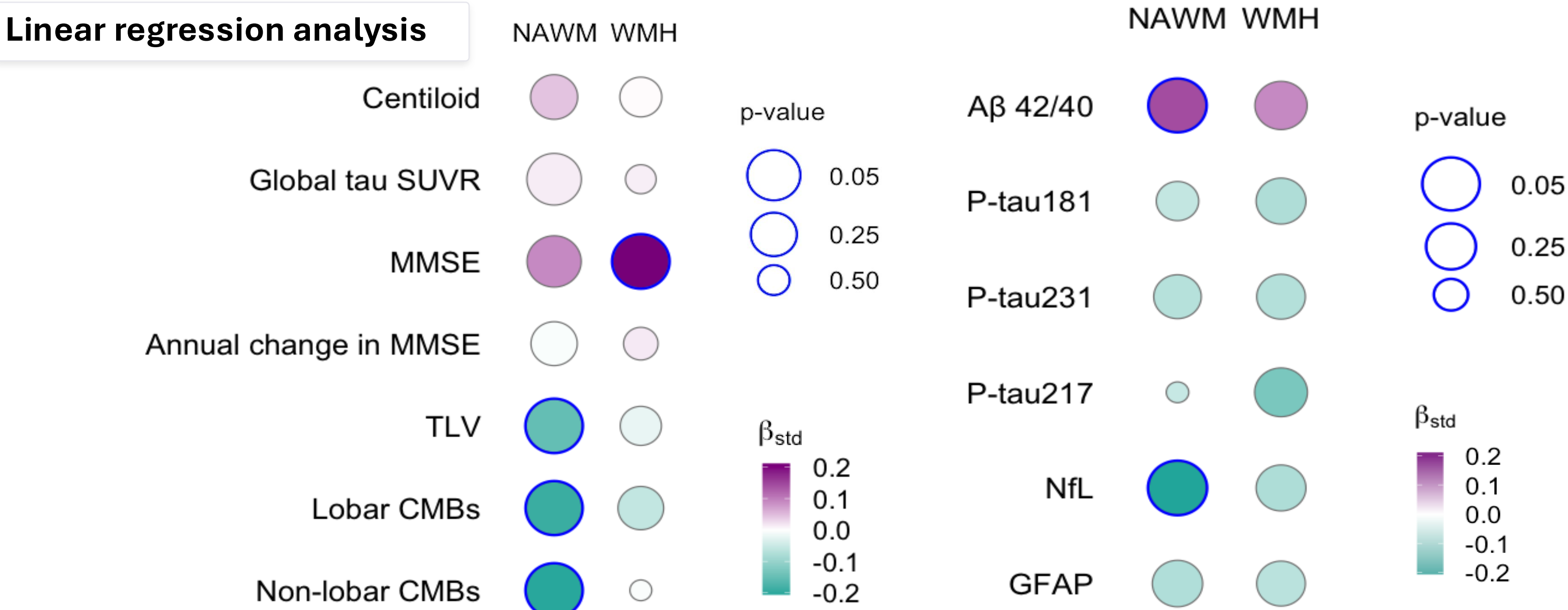
Parameters used:

- Beta coefficients (reflecting association effects)
- R² (explained variance)
- P-value for difference

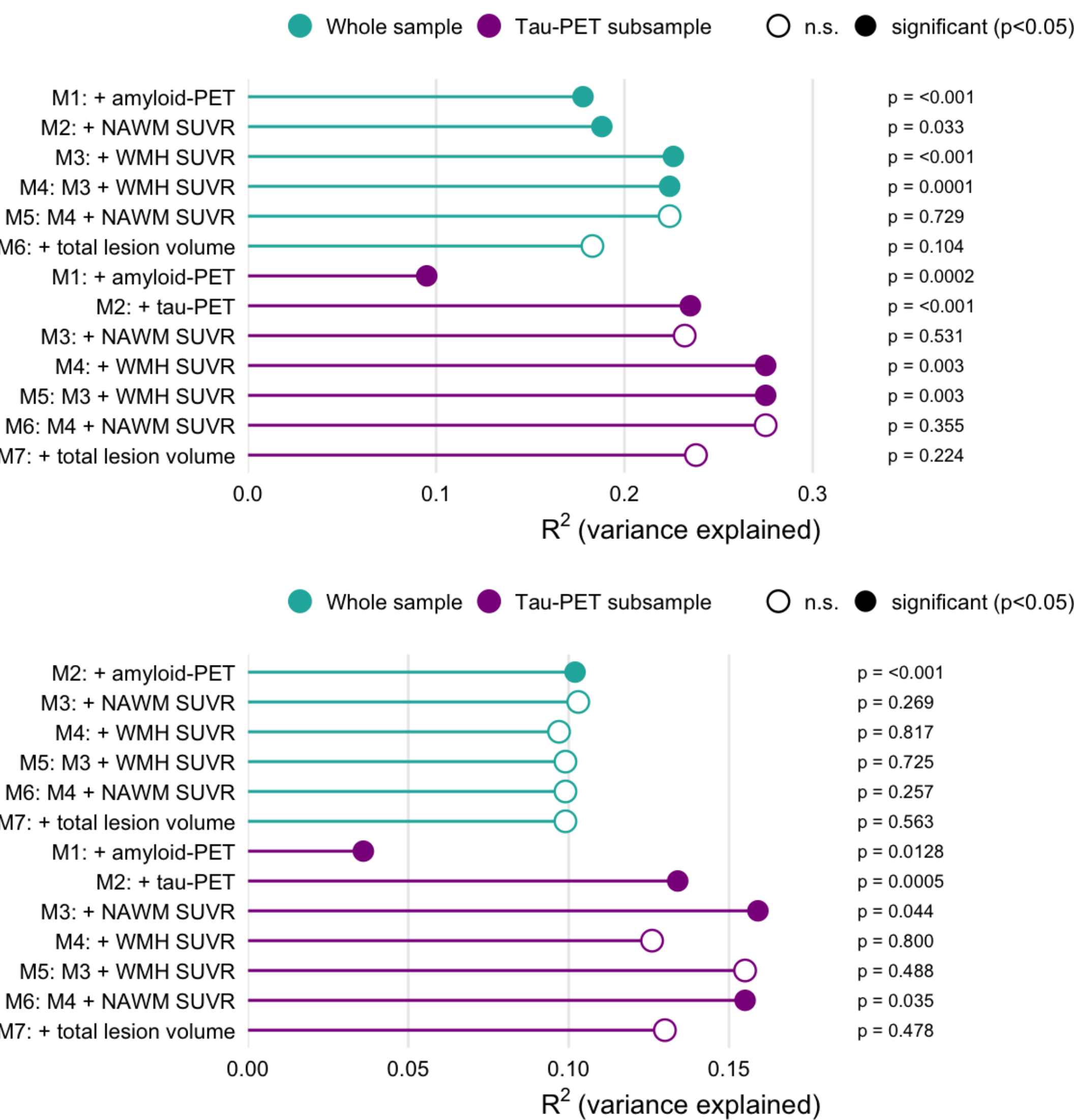
All models included age, sex, and years of education as covariates

Results

Linear regression analysis



Linear-mixed models



Conclusion

- Amyloid-PET uptake in WMH and NAWM likely reflects **myelin integrity**, their value as an independent biomarker is limited.
- WM measures may provide added value when integrated with other imaging biomarkers.
- NAWM SUVR may capture early changes relevant to disease progression.
- WMH SUVR may better reflect established impairment associated with current cognitive performance.
- Measures offer complementary insights, should be included in multimodal models of AD progression and cognitive decline.

For comments and questions:

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