ASSOCIATION BETWEEN SPEECH CHARACTERISTICS AND CORTICAL [^{18}F]GTP1 TAU PET TAU LEVELS IN PRODROMAL-TO-MILD ALZHEIMER'S DISEASE

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Background

Speech changes in Alzheimer's disease (AD) are potential early indicators of disease, but their validation against established AD biomarkers is lacking[1]. Tau pathology has been associated with the degree of cognitive impairment in AD[2,3,4]. We examined associations between speech and language characteristics and cerebral tau accumulation measured by tau PET in prodromal-to-mild AD.

Methods

- Baseline (N=88) and 18-month (N=46) longitudinal data from a subset of right-handed English-speaking participants in the Tauriel trial of semorinemab (NCT03289143) in prodromal-to-mild AD were analyzed.
- Speech samples recorded from Clinical Dementia Rating (CDR) administrations were analyzed using the Winterlight speech processing pipeline, generating over 500 acoustic and linguistic speech variables.
- Pearson correlations were computed to determine univariate associations between baseline speech features and cognitive scores with both baseline and baseline-to-endpoint change in [^{18}F]GTP1 tau PET SUVR values in whole cortical grey and other regions of interest (ROIs). Correlation coefficients (R) and uncorrected p-values (p) are included in Figures 1-4.

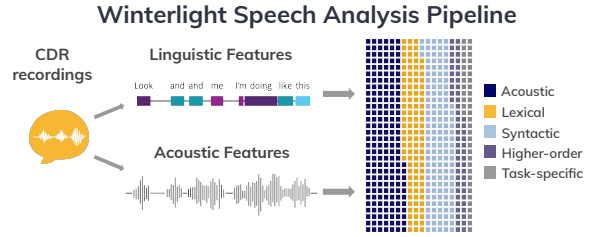


Figure 1: Cross-sectional correlations between whole cortical grey [^{18}F]GTP1 SUVR and global clinical scores (n=88)

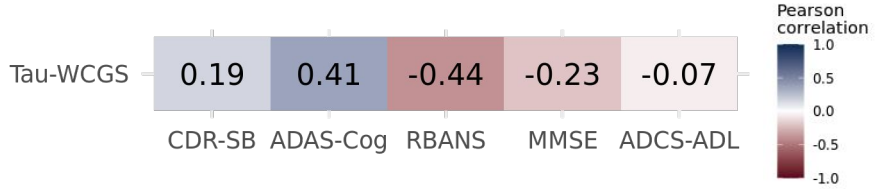


Figure 2: Cross-sectional correlations between whole cortical grey [^{18}F]GTP1 SUVR and speech characteristics (n=83)

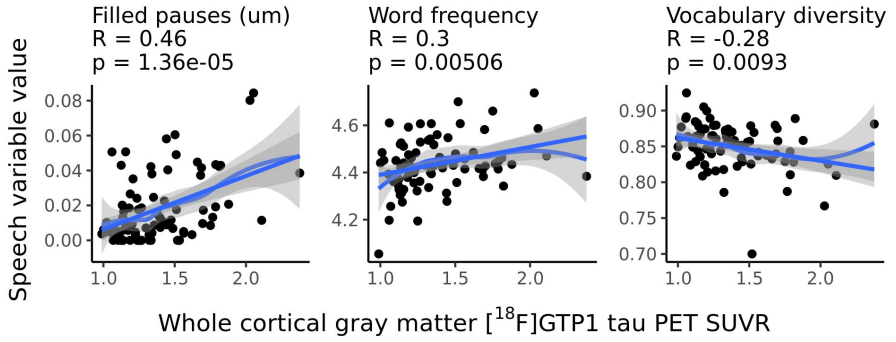


Figure 3: Cross-sectional correlations between [^{18}F]GTP1 SUVR and filled pauses generalize across ROIs (n=83)

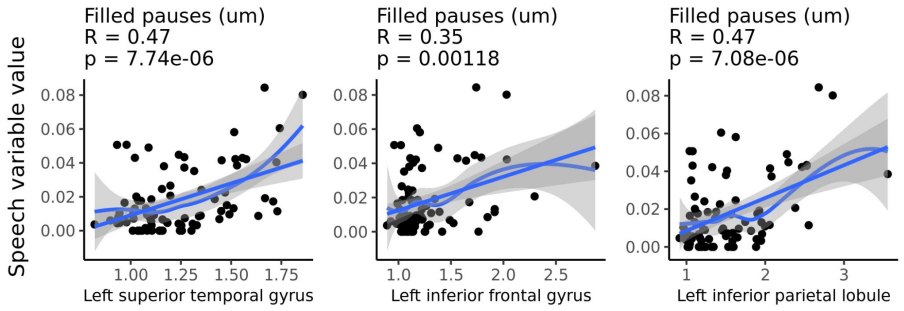
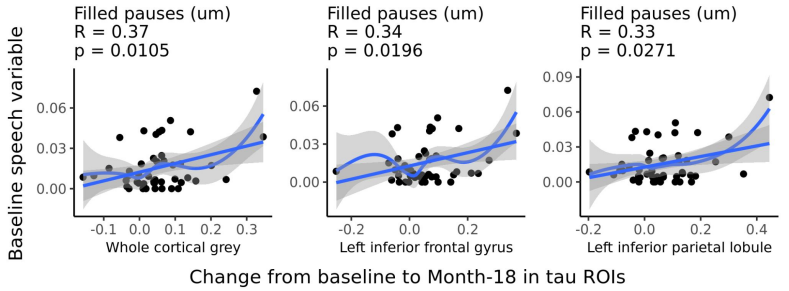


Figure 4: Baseline filled pauses correlate with increases in [^{18}F]GTP1 SUVR over 18 months (n=46)



Summary

- Speech and language features relating to pauses and vocabulary were associated with tau PET SUVR.
- Increased use of filled pauses, more frequent words and simpler vocabularies may indicate word finding difficulty and/or memory impairment related to increased underlying tau pathology.
- Associations were also observed between global clinical outcome measures and tau PET SUVR.
- These associations between speech and tau pathology are consistent with the hypothesis that increased cortical tau deposition may drive altered speech patterns associated with disease progression.

References

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