# p-017

# Thursday

## Unique Combinations of Structural MRI-Derived Shape Morphometric Features Improves Discriminability of FTLD Phenotypes

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Objective: Frontotemporal lobar degeneration (FTLD) is associated with diverse clinical phenotypes for which traditional structural MRI analyses lack discriminatory sensitivity and specificity. Here, we use a data-driven multivariate method to extract a concise set of MRI-derived shape morphometric features and examine their discriminatory capability in three FTLD clinical phenotypes.

Participants/Methods: Patients with sporadic or familial FTLD clinical syndromes (i.e., behavioral variant (bvFTD, n = 107), non-fluent variant primary progressive aphasia (nfvPPA, n = 27), semantic variant primary progressive aphasia (svPPA, n = 12)) and 27 controls without pathogenic mutations (CN) were assessed. Cortical morphometry measures of cortical thickness (CT), surface curvature (SC) metric distortion (MD) were extracted, contrasted with controls using linear models, and additionally entered into a sparse partial least squares discriminatory analysis (sPLS-DA) designed to model multimodal signatures unique to each phenotype. Discriminatory power of the sPLS-DA derived CT, SC, and MD features was tested alone and in combination which each other on independent, external data.

Results: We found that each cortical morphometric feature significantly differed between FTLD subgroups in dissociable spatial patterns. On independent data, the combination of CT and SC best discriminated bvFTD (AUC = 88.9) and nfvPPA (AUC = 90.9) subjects from CN. For svPPA, any model including CT maximized model performance (AUC = 100).

Conclusion: The sPLS-DA approach indicated distinctive brain regions contribute to discrimination for each shape feature, suggesting they may reflect unique aspects of neurodegeneration across groups. This method could prove invaluable in future studies for the early detection of FTLD phenotypes.

## Conflicts of interest

None