

Brain hypometabolism and behavior correlation in primary progressive aphasia

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Background: Fluorodeoxy-glucose positron emission tomography (FDG-PET) has been used to investigate regional changes in brain metabolism in primary progressive aphasia (PPA) (Rabinovici et al., 2008). However, the relationship between brain metabolic activity and PPA symptoms has not been well established (Matias-Guiu et al., 2022). In this study, we examined correlations between brain regional metabolic activity and aphasic symptoms in PPA.

Methods: Thirty-three right-handed individuals with PPA (15 agrammatic, 5 logopenic, 8 semantic, 5 mixed) and 11 healthy controls participated in this study. PPA individuals underwent language assessment for naming (Boston Naming Test, BNT), grammar (Northwestern Anagram Test and Northwestern Assessment of Verbs and Sentences, NAT-NAVS), repetition (Western Aphasia Battery Repetition subtest, WAB-Rep), and single-word comprehension (Peabody Picture Vocabulary Test, PPVT). Participants' FDG-PET scans were preprocessed using Statistical Parametric Mapping 12 software. Voxel-wise correlations between brain metabolic activity and language scores were calculated and corrected for family wise error at $p < 0.05$.

Results: Across PPA subtypes, metabolic activity in left anterior temporal lobe (ATL) positively correlated with BNT and PPVT, while metabolic activity in the left temporoparietal junction (TPJ) positively correlated with WAB-Rep. NAT-NAVS positively correlated with Broca's area metabolic activity.

Discussion: The pattern of correlation between metabolic activity in Broca's area, TPJ, and ATL and language measures follows the pattern previously reported in structural imaging studies of PPA (Rogalski et al., 2011) strengthening our understanding of the importance of these specific regions in pathophysiology of PPA.

Conflicts of interest

N/A