

Brainstem atrophy is linked to extrapyramidal symptoms in frontotemporal dementia

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Extrapyramidal (EP) symptoms are a known feature in a subpopulation of patients with behavioral variant frontotemporal dementia (bvFTD). Concomitant EP symptoms with FTD-like neuropsychiatric symptoms are also core features in progressive supranuclear palsy (PSP) and corticobasal degeneration (CBD). This complicates the early diagnosis of these disorders. Our retrospective register study aimed to discover imaging (MRI and FDG-PET) biomarkers to differentiate PSP, CBD, and bvFTD patients with extrapyramidal symptoms (EP+) from bvFTD patients without EP symptoms (EP-).

The records of 2751 patients were screened for the diagnoses and presence of EP symptoms. A total of 222 patients were submitted to imaging analysis and applicable imaging data were recovered from 139 patients. Neuroimaging data were analyzed using Freesurfer software.

In the whole cohort, EP+ patients showed lower volumes of grey matter compared to EP- patients in the putamen ($p=0.002$), bilateral globus pallidum ($p=0.002$, $p=0.042$), ventral diencephalon ($p=0.002$) and brain stem ($p<0.001$). In the bvFTD subgroup, there was volumetric difference between EP+ and EP- patients in the brain stem. FDG-PET scans in the bvFTD patient subgroup showed that EP+ patients had comparative hypometabolism of the superior cerebellar peduncle (SCP) and the frontal lobes.

We discovered that EP symptoms are linked to brainstem atrophy in bvFTD patients and the whole cohort. Also, evident hypometabolism in the SCP of bvFTD EP+ patients was detected as compared to bvFTD EP- patients. This could indicate that the EP symptoms in these diseases have a more caudal origin in the brainstem than in Parkinson's disease.

Conflicts of interest

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