Correlation of frontal atrophy and CSF tau levels with neuropsychiatric symptoms in patients with cognitive impairment: A memory clinic experience

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Abstract
Background: Behavioral and psychological symptoms of dementia (BPSD) are a distressful condition. We aimed to investigate the BPSD distribution in subjects with cognitive impairment, and the potential correlations between BPSD and neurodegeneration in terms of cerebrospinal fluid (CSF) tau and brain atrophy.

Method: One-hundred patients with mild cognitive impairment (MCI) or dementia (Alzheimer’s disease; Lewy-body disease, LBD; frontotemporal dementia; vascular dementia) underwent a complete diagnostic workup, including 3T-MRI and/or CT and CSF. Cortical atrophy was assessed with medial temporal atrophy (MTA), posterior atrophy (PA) and global cortical atrophy-frontal lobe (GCA-F) scales. BPSD were rated using Neuropsychiatric Inventory (NPI), and BPSD clusters were defined according to the European Alzheimer Disease Consortium.

Result: Delusions, hallucinations and psychosis cluster were differently distributed among the diagnostic groups (p<0.05, p<0.001, and p<0.05), with LBD patients showing higher scores for hallucinations (vs MCI, p<0.001, and AD, p<0.05) and psychosis cluster (vs MCI, p<0.05). In primary dementias, we found a negative correlation between NPI total score and tau levels (p=0.08), confirmed by beta regression (p<0.01), while a positive non-significant relationship was observed in MCI. Higher GCA-F scores were associated with delusions and apathy (p<0.05, on both hemispheres) and to hallucinations (left: p<0.01, right: p<0.05). GCA-F scores were positively correlated with psychosis cluster (right: p<0.05), and agitation/aggression (left: p<0.05). Conversely, nighttime disturbances were positively correlated with both GCA-F and MTA scores (left: p<0.01; right: p<0.05).

Conclusion: Our results suggest that psychotic symptoms are significantly more represented in LBD patients, and that CSF tau and frontal atrophy are associated with the occurrence and severity of BPSD in clinical practice. Longitudinal studies are however required to ascertain their actual predictive value.