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CSF tau biomarkers and structural brain MRI measures in frontotemporal lobar degeneration

Giuseppe Fenu[1], V. Oppo[1], G. Serra[1], L. Lorefice[2], F. Di Stefano[1], D. Deagostini[1], C. Mancosu[2], E. Fadda[2], C. Melis[2], P. Siotto[3], E. Cocco[2], M. Melis[1], G. Cossu[1]

[1]Department of Neuroscience, A.O. Brotzu, Cagliari, Italy
[2]Multiple Sclerosis Centre, University of Cagliari, Cagliari, Italy
[3]Radiology Unit, A.O. Brotzu, Cagliari, Italy

Introduction: In recent years, in the field neurodegenerative diseases, increasing attention has been pointed to CSF biomarkers and their integration with neuroimaging [1]. Frontotemporal lobar degeneration (FTLD) refers to a heterogeneous group of clinical syndromes with different underlying proteinopathies including tau pathology [2]. CSF biomarkers have been proposed as diagnostic and prognostic factors [3].

Objective: Aim of our study was to evaluate the relationship between CSF tau biomarkers and structural MRI brain measures in FTLD.

Materials and Methods: We included early FTLD patient. All included patients underwent lumbar puncture to evaluate amyloid, total-tau (t-tau), phospho-tau 181 (p-tau); p-tau/t-tau ratio was also calculated; brain MRI was performed to estimate whole brain volume, volume of principal deep grey matter structures and regional cortical thickness using FreeSurfer software version 7.1.1 (http://surfer.nmr.mgh.harvard.edu). The principal clinical and demographic features were also recorded.

Results: Demographic characteristics of the 28 included patients were as follows: female/male: 9/19; mean±SD age: 67.9±7.7 years. The p-tau/t-tau ratio was significantly correlated with whole brain volume ($r=0.77$; $p < 0.001$), brain-stem volume ($r=0.41$; p: 0.04), left putamen volume ($r=0.57$ p: 0.006) left pallidum volume ($r=0.41$; p: 0.04), right accumbens volume ($r=0.47$; p: 0.02). P-tau/t-tau ratio showed also a significant correlation with cortical thickness of left temporal lobe ($r=0.74$; $p < 0.001$) and left caudal middle frontal cortex ($r=0.45$; p: 0.03). Linear regression showed a significant relationship between p-tau/t-tau ratio and left temporal pole ($p = 0.001$; r^2: 0.60) after controlling for age and gender.

Conclusions: Our data suggest that CSF biomarkers, especially p-tau/t-tau ratio, could play a role as prognostic factor in FTLD. Further longitudinal investigations are needed to confirm these findings.

References:

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