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Evaluation of serum tau and β-amyloid peptides in Parkinson's disease

Henri Zenuni[1], P. Grillo[1], G. Guerrera[2], L. Battistini[2], N.B. Mercuri[1,2], G.M. Sancesario[2], T. Schirinzi[1]

[1]Unit of Neurology, Department of Systems Medicine, University of Roma Tor Vergata, Rome, Italy
[2]IRCCS Fondazione Santa Lucia, Rome, Italy

Introduction: Pathological events occurring at brain level can reflect at peripheral level; accordingly, blood tissue could represent a potential easy-accessible source for reliable biomarkers. Indeed, the measurement of neurodegerationrelated blood biomarkers is gaining clinical relevance in Alzheimer's disease field; however, data on Parkinson's disease (PD) are still scarce.

Objective: To provide a pilot case-control study assessing serum levels of classical neurodegeration-related biomarkers in PD, looking at correlations with both the respective CSF content and the main clinical parameters.

Methods: The study involved 22 PD patients and 10 control subjects. Classical neurodegeration-related biomarkers (total tau protein, amyloid-β-42 and amyloid- β-40 peptides) were measured by an ultrasensitive methodology of single molecule array (SiMoA) in serum, and by electrochemiluminescence immunoassay (ECLIA) in CSF. Standard motor (UPDRS part III) and non-motor scores (NMSS and MoCA) were collected for each patient, together with LEDD calculation. Serum biomarkers were compared between patients and controls, and correlated with their CSF content and clinical data separately in each group.

Results: Serum biomarkers did not differ between patients and controls. In PD patients but not in controls, serum tau and amyloid-β-42 directly correlated with their respective CSF levels. In addition, serum tau inversely correlated with cognitive performances (MoCA score).

Conclusions: This pilot study showed that in PD neurodegeneration-related biomarkers change in serum in parallel to CSF. Accordingly, they may represent an easy-accessible source for clinically-informative markers, as the correlation with clinical score also suggest. However, further confirmatory studies are now needed.