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Relationship between oligomeric α-synuclein/SNARE complex proteins and cerebral blood flow alteration in Parkinson's disease

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Introduction: Together with neuronal degeneration, perfusion parameters may also be altered in Parkinson's disease (PD) due to neurovascular unit function changes. Despite the consistent evidence of these perfusional alterations [1], it remains unclear the relationship between synucleinopathy and abnormal cerebral blood flow (CBF) in PD. Within pathological biomarker in PD, neural derived extravesicles (NDEs) measurements of oligomeric α-Synuclein and presynaptic SNARE complex proteins are widely recognized to play a crucial role [2].

Objective: The aim of this study was to pilot testing in a cohort of mild PD the relationship between disruption of Arterial Spin Labeling (ALS)-measured CBF brain networks and NDEs levels of pathogenic oligomeric α-Synuclein and SNARE complex proteins (STX-1A, VAMP-2 and SNAP-25).

Methods: Twenty-five subjects with a diagnosis of PD according to the Movement Disorder Society Clinical Diagnostic Criteria were enrolled. The MRI acquisition protocol (3T Siemens Prisma scanner) included a T1-3D high-resolution sequence and a multi-delay pseudo-continuous ASL (pCASL) sequence to derive CBF maps. pCASL images processing was conducted according to [3] and CBF values within functional networks were obtained. NDEs were isolated from peripheral serum samples by immunocapture with L1CAM antibody. Oligomeric α-Syn and SNARE complex proteins levels were measured in NDEs extracts by sandwich ELISA.
The relationship between NDEs levels and CBF values was tested with partial Spearman's correlation analysis, controlling for age.

Results: Positive significant correlations were observed between CBF and STX-1A within several networks (i.e. dorsolateral-rho 0.51, p.005 and frontoparietal networks-rho 0.55, p.003). No significant negative correlations were found.

Conclusions: Our results suggest that a relationship between low levels of STX-1A and low CBF values in the cortical frontoparietal brain networks may be present. A combination of structural imaging and measurement of serum NDEs biomarkers can provide new insights into the relationship between synucleinopathy and CBF changes in PD.

References

[1] Arslan DB et al. J Neural Transm (Vienna). 2020 Sep;127(9):1285-1294.
[2] Agliardi C et al. Neurobiol Dis. 2021 Jan;148:105185.
[3] Pelizzari et al. Front Neurol. 2020; 11: 562. [5] Mancini et al. Front Neurol. 2019 Jan 7;9:1149.