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Dopamine striatal availability in brain and body first Parkinson's disease patients

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Introduction: Recently it has been suggested that there are two distinct subtypes of Parkinson's disease, brain-first (BR) and body-first (BO). In BR, the accumulation of a-synuclein (a-syn) starts in the brain and spreads to the enteric nervous system (ENS). In contrast, BO shows early autonomic dysfunction and RBD, and α-syn accumulation originates in the ENS, with more symmetrical nigrostriatal degeneration [1]. The purpose of this study is to evaluate possible differences in the 123I-FP-CIT SPECT ratios in patients with and without dysautonomia and RBD at diagnosis.

Aim: The purpose of this study is to evaluate possible differences in the 123I-FP-CIT SPECT ratios in patients with and without dysautonomia and RBD at diagnosis.

Methods: We retrospectively analyzed 56 PD patients undergoing 123I-FP-CIT SPECT at the time of diagnosis. We divided the patients into two groups: BO, those who already had RBD, constipation or orthostatic hypotension at the time of diagnosis, and BR. We evaluated striatal asymmetry index (SAI), 123I-FP-CIT SPECT specific binding ratio (SBR) and any differences between the two groups by t-test or Chi-square.

Results: The two groups were homogeneous in terms of age at the time of 123I-FP-CIT SPECT (62 ± 10.68 vs 66.38±10.15), levodopa equivalent dose (107.23 ± 161.17 vs 91.67 ± 109.11), lateralization and severity of motor symptoms (MDS-UPDRS III 18.51 ± 8.09 vs 15.73 ± 8.25). SAI revealed no significant differences in the two groups, while SBR at the left putamen (1.25 ± 0.37 vs 1.59 ± 0.38 p=0.003) and left striatum level (1.88 ± 0.46 vs 2.16 ± 0.38 p=0.036) were significantly reduced in BR patients compared to BO patients.

Conclusions: BR patients show a significant reduction at the level of the left striatum, particularly the putamen, compared to the BO group at the onset of the disease. However, there are no differences in SAI.

References:

[1] Horsager J, Andersen KB, Knudsen K, Skjærbæk C, Fedorova TD, Okkels N, Schaeffer E, Bonkat SK, Geday J, Otto M, Sommerauer M, Danielsen EH, Bech E, Kraft J, Munk OL, Hansen SD, Pavese N, Göder R, Brooks DJ, Berg D, Borghammer P. Brain-first versus body-first Parkinson's disease: a multimodal imaging case-control study. Brain. 2020 Oct 1;143(10):3077-3088. doi: 10.1093/brain/awaa238. PMID: 32830221.