

**Distinct striatal connectivity patterns in patients with Parkinson's disease with and without urinary symptoms**

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*Introduction:* Urinary symptoms are frequent in patients with Parkinson's disease (PD) and may severely affect quality of life. The pathophysiological mechanisms potentially underpinning their presence are still unclear.

*Objective:* We aimed at investigating the potential effect of urinary symptoms on the regional striatal functional connectivity (FC) in a cohort of drug-naïve PD patients applying a region-of-interests-(ROIs)-based approach to resting-state functional MRI data.

*Methods:* Seventy-nine drug-naïve PD patients (45 PD-urinary+/34 PD-urinary-) and 38 healthy controls (HC) were consecutively enrolled. Motor, nonmotor and cognitive assessments were performed. Using connectivity-based parcellation, we obtained three ROIs for different striatal functional subregions: sensorimotor, limbic and cognitive.

*Results:* No demographical/clinical differences were found between PD-urinary+ and PD-urinary- patients. PD-urinary+ showed increased FC between the sensorimotor ROI and the bilateral fusiform gyri compared to HC. The limbic ROI showed increased FC with the right superior temporal gyrus, and decreased FC with left insula, left anterior cingulate cortex and right anterior PFC in PD-urinary+ patients compared to HC. The right cognitive ROI showed increased FC with the left insula in PD-urinary+ patients compared to HC.

PD-urinary- showed decreased FC between the sensorimotor ROI and the bilateral substantia nigra as well as decreased FC between the limbic ROI and the right anterior PFC and left dorsal PFC compared to HC. Compared to PD-urinary-, PD-urinary+ showed increased FC between the sensorimotor ROI and the right premotor/supplementary as well as the primary motor areas, and decreased FC between the sensorimotor ROI and the right angular gyrus. The limbic ROI showed also decreased FC with the left anterior PFC in PD-urinary- patients compared to PD-urinary+.

*Conclusions:* Our findings revealed that the presence of a specific pattern of striatal FC may be potentially associated to altered urge perception and motor control in early PD patients, eventually leading to high micturition frequency and urgency.