Bladder dysfunction in Parkinson's disease

Lower urinary tract symptoms are common in patients with Parkinson's disease, either storage symptoms (overactive bladder symptoms or OAB) or Urination symptoms. The most important diagnostic clues for urinary disturbances are provided by the patient's medical history [1].

Pathophysiology

Lower urinary tract symptoms (LUTS) are the most common nonmotor symptoms usually occurring mid-stage of Parkinson's disease (PD); however, its underlying mechanisms are unknown.

Bladder dysfunction may cause disabling symptoms in Parkinson's disease (PD) patients. The majority of patients' experience symptoms as urinary urgency and nocturia suggest overactive bladder. This seems to be due to an altered brain-bladder relationship because of alteration in fronto-basal ganglia D1-dopaminergic circuit that normally suppresses micturition-reflex.

Roh et al. aimed to assess whether corticometry or volumetry can identify a pattern of cerebral cortical changes in PD patients with LUTS.

They recruited 85 idiopathic PD patients and performed corticometry and volumetry on various cortical regions using each patient's magnetic resonance imaging. To identify a correlation between the cortical thickness/volume and nonmotor symptoms scale domain 7 scores, which represent the severity of LUTS, they performed a general linear model and region of interest analyses.

Significant regional thinning of the left precuneus left temporal pole, left precentral, right precuneus, and right pars opercularis was correlated with nonmotor symptoms scale domain 7 scores. They also found that cortical volumes of the left precuneus and left frontal pole were inversely correlated with the severity of urinary symptoms.

This study showed that the thicknesses and volumes of several cortical regions were significantly correlated with the severity of LUTS in PD patients. The findings of regional atrophy and thinning of specific cortical regions in this study provide additional evidence that multiple cortical regions, especially the precuneus cortex, not only may be involved in urinary dysfunctions of PD patients but also may help to elucidate the exact underlying mechanisms for LUTS in PD patients [2].

Previous studies demonstrated the beneficial effect of D1/D2 dopamine-receptors chronic-stimulation on detrusor overactivity of PD-patients.The present study was aimed to evaluate the possible effect of extended-release (ER) Levodopa administered at bed-time on both nocturia and nocturia-related quality-of-life (NQoL) in PD-patients.

106 PD-patients (Hoehn and Yahr>1 and < 4, mean age 66 years, 59 females and 47 males) were enrolled by 7 Movement Disorders out-patients clinics. Patients undergo to International Prostatic Symptoms Scale-IPSS, including 1-item about nocturia (item 7), and to Nocturia Quality of Life-NQoL questionnaire, at baseline and after two-months of Extended-Release L-dopa (L-dopa/carbidopa or L-

dopa benserazide) treatment at bed-time.

Statistical analysis showed significant improvement on both total IPSS, item 7and NQoL scores following two-months ER L-dopa-treatment. ΔIPSS score inversely correlated with disease duration.

These results support previous evidence of pathophysiological involvement of dopaminergic transmission on bladder dysfunction in Parkinson's disease [3].

Treatment

Bladder dysfunction in Parkinson's disease treatment.

1)
Moussa M, Abou Chakra M, Papatsoris AG, Dellis A, Dabboucy B, Peyromaure M, Barry Delongchamps N, Bailly H, Duquesne I. Perspectives on the urological care in Parkinson's disease patients. Arch Ital Urol Androl. 2022 Mar 30;94(1):107-117. doi: 10.4081/aiua.2022.1.107. PMID: 35352535.
2)
Roh H, Kang J, Hwang SY, Koh SB, Kim JH. Regional Cerebral Cortical Atrophy is Related to Urinary Tract Symptoms in Parkinson's Disease. J Neuroimaging. 2021 Feb 3. doi: 10.1111/jon.12829. Epub ahead of print. PMID: 33534966.
3)
Brusa L, Ponzo V, Stefani A, Ceravolo R, Palermo G, Agrò EF, Viselli F, Altavista MC, Iani C, Stocchi F, Stanzione P, Vitale C. Extended release levodopa at bedtime as a treatment for nocturiain Parkinson's disease: An open label study. J Neurol Sci. 2019 Dec 16;410:116625. doi: 10.1016/j.jns.2019.116625. [Epub ahead of print] PubMed PMID: 31877419.