

Examinations of major salivary glands and heart reveal pathophysiological progression of Parkinson's

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Researchers have reported that patients with Parkinson's disease (PD) exhibiting sympathetic denervation in the major salivary glands and the

heart tend to have more advanced non-motor symptoms as they age, suggesting that age plays an important role in disease progression.

This research outcome could potentially contribute to a better understanding of the pathophysiological progression of PD. The work is [published](#) in the *Journal of the Neurological Sciences* on 15 March 2024. The researchers include Dr. Junya Ebina and Professor Osamu Kano from the Department of Neurology, Toho University Faculty of Medicine, along with Professor Sunao Mizumura from the Department of Radiology.

PD patients with sympathetic [denervation](#) in the major salivary glands and heart, as indicated by MIBG scintigraphy, are older and have more severe non-motor symptoms, such as olfactory dysfunction, REM sleep behavior disorder, and autonomic nervous system dysfunction according to questionnaire scores, compared to groups with single sympathetic denervation or non-sympathetic denervation. However, cognitive function, duration of illness, and MDS-UPDRS motor symptom scores were comparable between the groups.

In this study, a quantitative semi-automatic method developed by the research group last year was used to analyze MIBG uptake in the major salivary glands and heart. This comparative study of clinical symptoms focusing on peripheral organs in patients with PD may provide a new perspective on [disease progression](#).

This study may contribute to understanding the pathophysiological progression of PD, leading to a more accurate staging of PD and enabling tailored medical care according to individual patient conditions. The research group is also examining the utility of novel adjunct diagnostic methods.

Presentation overview

PD is a progressive neurodegenerative disorder characterized by abnormal aggregates of α -synuclein known as Lewy bodies. Lewy bodies are not only found in the central nervous system but also in peripheral organs. In PD, cardiac sympathetic denervation detected by ^{123}I -metaiodobenzylguanidine (MIBG) myocardial scintigraphy is associated with the presence of Lewy bodies.

Conversely, although Lewy bodies are frequently found in the [digestive tract](#), including in the major salivary glands, the process of pathophysiological progression in peripheral organs is unclear. A research group previously reported sympathetic denervation in the submandibular and parotid glands of patients with PD.

Therefore, in this study, they hypothesized and verified whether patients with PD and sympathetic nerve dysfunction in the heart and major salivary glands have more advanced clinical symptoms.

Patients with PD with sympathetic denervation in both major salivary glands and heart areas (dual-SD group) were found to be older, have more severe [olfactory dysfunction](#), and a higher likelihood of having REM sleep behavior disorder and severe autonomic nerve dysfunction compared to the single-SD group or non-SD group.

However, the duration of illness and cognitive function were similar among the groups. Logistic regression analysis with age, sex, and duration of illness as variables showed that age was an important factor affecting clinical evaluation items in the progression of the disease.

In conclusion, patients with PD and decreased MIBG uptake in both the major salivary glands and heart areas exhibited a progression of symptoms centered around non-motor symptoms, suggesting that autonomic nerve dysfunction may progress independently of nigrostriatal dopaminergic degeneration.

Furthermore, the potential contribution of age to the pathophysiological progression of PD was suggested. This study may aid in understanding the pathophysiological progression of PD and may be used for future staging of individual patients.

More information: Junya Ebina et al, Clinical characteristics of patients with Parkinson's disease with reduced 123I-metaiodobenzylguanidine uptake in the major salivary glands and heart, *Journal of the Neurological Sciences* (2024). [DOI: 10.1016/j.jns.2024.122932](https://doi.org/10.1016/j.jns.2024.122932)

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