Autonomic Dysfunction in Parkinson's Disease: A Cross-Sectional Analysis of Cardiovagal and Adrenergic Functions and the Role of Dopaminergic Medications

Yogesh Kumar

All India Institute of Medical Sciences (AIIMS) Patna, Bihar, India

Abstract:

Background: Parkinson's disease (PD) is a neurodegenerative disorder characterized by motor and non-motor symptoms, including significant autonomic dysfunction that profoundly affects patients' quality of life.

Aim: This study aims to comprehensively evaluate cardiovagal and adrenergic functions in PD patients, analyze their relationship with disease severity, and assess the effects of dopaminergic medication on autonomic function.

Methodology: A total of 60 PD patients and 30 healthy controls underwent autonomic function tests, including deep breathing, the Valsalva maneuver, and the head-up tilt test. For PD patients, assessments were conducted in both the ON and OFF medication states to determine the impact of dopaminergic therapy.

Results: PD patients exhibited significantly impaired autonomic function compared to controls ($p < 0.001$ across all major parameters). Moderate to strong correlations were observed between autonomic dysfunction and disease severity ($r = -0.48$ to -0.52, $p < 0.001$). Dopaminergic medication provided modest improvements in specific autonomic measures, such as heart rate variability and baroreflex sensitivity ($p < 0.05$), suggesting potential therapeutic benefits.

Conclusion: This study highlights the prevalence and severity of autonomic dysfunction in PD, its association with disease progression, and the partial ameliorative effects of dopaminergic therapy. These findings underscore the need for targeted interventions to address autonomic symptoms in PD.

Keywords:

Parkinson's Disease, Autonomic Dysfunction, Cardiovagal Function, Adrenergic Function, Sudomotor Function, Heart Rate Variability, Baroreflex Sensitivity.