

Caregiver's burden in cardiovascular dysautonomia associated with Parkinson's Disease

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Introduction: Cardiovascular autonomic neuropathy (cAN) is one of the most common disabling and frequently unrecognized features of Parkinson's disease (PD), with an estimated prevalence of at least 30-50% [1,2,3]. However, its impact on caregivers' burden has been scarcely investigated.

Objective: We sought to estimate the impact of cAN on informal caregivers of patients with PD, defined as individuals providing regular care to a friend, partner, or family member with PD, and to evaluate the mutual relationship between caregivers' burden and patient health-related quality of life (HRQoL).

Methods: We enrolled 36 consecutive PD patients and their caregivers. Patients underwent a detailed motor, autonomic, cognitive, and functional assessment. Caregivers were assessed by means of the Zarit Burden Interview (ZBI). Differences in caregivers' burden and strength of association between caregivers' burden, cAN severity, and patients' HRQoL were assessed using ANCOVA, logistic regression, and linear regression analyses. Analyses were adjusted for patients' and caregivers' age, PD duration, PD motor and cognitive disability.

Results: cAN+ patients showed a significantly higher impairment in non-motor and motor experience of daily living, lower MoCA scores, and worse HRQoL. Moderate-severe caregiver burden was reported in 41.7% of PDcAN+ vs. 8.7% of PDcAN- ($p < 0.001$). The ZBI score was increased in PDcAN+ vs. PDcAN- (31.48 ± 3.36 vs. 15.23 ± 2.31 ; $p < 0.001$), with 10-fold higher odds ($p = 0.012$) of moderate-severe caregiver burden in PDcAN+, even after adjusting for potential confounders, such as patient's age, disease duration, cognition, motor disability, and caregiver's age. The ZBI score correlated with cAN severity ($p = 0.005$), global autonomic impairment ($p = 0.012$), and HRQoL impairment ($p < 0.001$).

Conclusion: These results highlight the significant impact of cAN on PD caregivers, with caregivers' distress possibly reflecting on the patient's quality of life, therefore affecting the wellbeing of both. Our findings underline the need for targeted interventions addressing this frequently overlooked and insufficiently treated source of disability in PD.

References:

- [1] Jain S, Goldstein DS (2012) Cardiovascular dysautonomia in Parkinson disease: from pathophysiology to pathogenesis. *Neurobiol Dis* **46**, 572-580.
- [2] Merola A, Romagnolo A, Rosso M, Suri R, Berndt Z, Maule S, Lopiano L, Espay AJ (2018) Autonomic dysfunction in Parkinson's disease: A prospective cohort study. *Mov Disord* **33**, 391-397.
- [3] Merola A, Romagnolo A, Comi C, Rosso M, Artusi CA, Zibetti M, Lanotte M, Duker AP, Maule S, Lopiano L, Espay AJ (2017) Prevalence and burden of dysautonomia in advanced Parkinson's disease. *Mov Disord* **32**, 796-797.