

Orthostatic hypotension in Parkinson's disease: do height and weight matter?

Nicole Campese^{1,2}, G. Goebel³, L. Fabian², J.P. Ndayisaba², S. Eschlboeck², C. Kaindlstorfer², C. Raccagni^{2,4}, R. Granata², R. Ceravolo¹, S. Kiechl², K. Seppi², W. Poewe², G.K. Wenning², A. Fanciulli²

¹Neurology Unit, Department of Clinical and Experimental Medicine, University of Pisa, Pisa, Italy

²Department of Neurology, Medical University of Innsbruck, Innsbruck, Austria

³Department of Medical Statistics, Informatics and Health Economics, Medical University of Innsbruck, Innsbruck, Austria

⁴Department of Neurology, Regional General Hospital Bolzano, Bolzano, Italy

Introduction: Orthostatic hypotension (OH) is a common non-motor feature in Parkinson's disease (PD), being reported by every third PD patient [1]. Besides classic OH, transient forms of orthostatic hypotension occurring within the first minute upon standing (transient OH, tOH) have been recently described [2]. Pilot studies in Asian populations report an association between lower body mass index (BMI) and classic orthostatic hypotension (cOH) [3-5]. The impact of height and BMI on cOH and tOH in European PD patients has never been explored.

Objective: To investigate the association between height, BMI and the presence of laboratory-confirmed cOH or tOH in PD.

Methods: We performed a sub-analysis of a previously published cohort of 173 PD patients, who underwent cardiovascular autonomic function testing (CAFTs) at the Medical University of Innsbruck between 2007 and 2020, by collecting information on height and weight at the time of CAFTs.

Results: In our cohort, BMI did not differ in patients with either cOH, tOH or without any OH. Height also did not differ between female patients with or without any form of orthostatic blood pressure dysregulation. After adjusting for age, male patients with a height <172.5 cm showed a lower cOH burden [OR=0.141, (95% CI 0.030-0.663), p=0.013] compared to taller ones, despite other cardiovascular autonomic indices were equally impaired.

Conclusions: While BMI does not seem to impact on the development of cOH or tOH, a shorter stature may represent a protective factor for cOH in male PD patients. Given that cardiovascular autonomic indices other than cOH were equally impaired in short and taller patients, we suggest an underlying hydrostatic mechanism, related to fluid shifts when changing from the supine to the upright position. Identifying individual and PD-related risk factors for OH will help developing tailored screening approaches for this overlooked condition.

References

- [1] D.C. Velseboer et al., Prevalence of orthostatic hypotension in Parkinson's disease: A systematic review and meta-analysis. *Parkinsonism & Related Disorders*, 2011. 17(10): p. 724-729.
- [2] A. Fanciulli et al., Association of transient orthostatic hypotension with falls and syncope in patients with Parkinson disease. *Neurology*, 2020. 95(21): p. e2854-e2865.
- [3] Q. Wu et al., Sex differences in underweight and body mass index in Chinese early de novo patients with Parkinson's disease. *Brain Behav*, 2020. 10(12): p. e01893.
- [4] T. Nakamura et al., Lower body mass index is associated with orthostatic hypotension in Parkinson's disease. *J Neurol Sci*, 2017. 372: p. 14-18.

[5] T. Umehara et al., Body weight and dysautonomia in early Parkinson's disease. *Acta Neurol Scand*, 2017. 135(5): p. 560-567.