

Abstract

Real-World Monitoring of Postural Hypotension Leveraging Cardiovascular Wearable Sensors: A Feasibility Study in Parkinson's disease patients

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Orthostatic hypotension (OH) is a common non-motor symptom in Parkinson's disease (PD), characterized by a significant drop in blood pressure upon standing. Despite its prevalence, OH remains under-diagnosed, complicating PD management and progression. Wearable medical devices offer a promising solution by enabling continuous monitoring, both in clinical settings and daily life, facilitating early detection of OH.

The primary objective of this study is to assess the feasibility of utilizing sensor-derived estimations of blood pressure and posture to identify OH during the Schellong test, with manual diagnosis by clinicians serving as the reference standard.

Two medical devices will be used to measure the required raw data for the development of algorithmic procedures related to cardiovascular regulation: the SOMNOtouch and the Empatica EmbracePlus. The SOMNOtouch estimates blood pressure using electrocardiogram (ECG) and photoplethysmography (PPG), while the Empatica EmbracePlus leverages an accelerometer and PPG sensors to monitor physiological and activity-related parameters.

Sixty participants will be recruited from the NCER PD cohort, divided into three groups: 20 PD patients with symptoms of OH, 20 PD patients without suspected OH, and 20 healthy participants as a control group. The study is planned to start in November 2024.