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Postural hemodynamic parameters in older persons have a season-dependency

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Aims and Objectives: The regulation of blood pressure (BP) during upright standing depends on many factors. It is well known that the effects of temperature on the cardiovascular system and BP values are higher in winter months. But there is a lack of studies that have analysed how the cardiovascular system in post-stroke patients responds to postural changes during cold and warm months. The aim of this study was to examine how temperature in two seasons (cold months and warm months) affects the responses of hemodynamic mechanisms and heart rate variability during a sit-to-stand test in stroke patients and non-stroke participants.

Methods: We investigated 41 participants: stroke (n= 16) and age-matched non-stroke participants (n=25), age >55 yrs, during a sit-to-stand test (5 min of sitting followed by 5 min of standing) in two different seasons. We used a Task Force Monitor® device to continuously monitor beat to beat systolic blood pressure (SBP), diastolic blood pressure (DBP), heart rate (HR), stroke index (SI) and cardiac index (CI), and power spectral analysis of the heart rate variability (HRV).

Results: Mean values of baseline DBP (stroke: 90.624 ± 4.522; non-stroke participants: 84.846 ± 2.018) and MBP (stroke: 107.803 ± 5.084; non-stroke participants: 103.318 ± 4.1825) were significantly higher during colder months compared to warmer months in both groups. Mean values of baseline SI (stroke: 26.820 ± 1.552; non-stroke participants: 28.781 ± 1.4382), and CI in non-stroke participants (2.142 ± 0.1052) were found to be significantly lower during colder months. After standing, there was a significant decrease in SBP, and MBP values in non-stroke participants only and stroke patients in warmer months only.

Conclusions: Our study of the effects of seasonal variations in postural blood pressure changes and differences in postural blood pressure change between stroke and non-stroke participants shows that BP values depend on season, being higher in colder months in both groups. Furthermore, standing up in warmer months in non-stroke participants leads to a significant decrease in BP but not in stroke patients. Since postural instability and falls are common in older persons, the results of our study point for a season-dependent reduction in blood pressure during standing up in older persons that could predispose such persons to orthostatic intolerance and falls in warmer months.

Biography

Irhad Trozic is Currently doing his PhD at the medical university in Graz at Gravitational Physiology & Medicine research Unit at the Institute of Physiology. The title of m< project is: Vascular Function in Health and Disease, a gender comparative study. The study focuses on differences in vascular response to orthostatic stress between age, gender, health and diseases. His special topic of interest is Vascular function assessment.

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