Reviewer’s report

Title: Blood pressure change does not associate with Center of Pressure movement after postural transition in geriatric outpatients

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Reviewer: Jasmine Menant

Reviewer’s report:

This study aimed to investigate the relationship between centre of pressure movement and blood pressure in older people, immediately after being stood up from a chair (30s-180s). The secondary question was whether the centre of pressure movement differed between those with and without orthostatic hypotension.

The study set to explore a mechanism to explain the relationship reported in previous studies between orthostatic hypotension and falls in older people. The hypothesis being that blood pressure drops within 3 minutes after standing up would be related to increased movement or movement variability of the centre of pressure. Interestingly, the results are in contrast with previous research which might have used less precise measures of balance; the findings indeed do not lend support to a relationship among center of pressure movement, blood pressure fluctuations and orthostatic hypotension, immediately upon standing in older people. Overall the paper is clearly written, the methods and data analysis appear rigorous and sound. However I have one major concern, outlined thereafter.

Lines 9-14, page 10: The CoP data recorded between 0s and 30s after standing up were not analyzed on the basis that "patients need 30s to find their balance following postural change and regardless of having OH or not" (Johnson et al., 2003). The cited study (Johnson et al., 2003) did not discriminate between older people with or without orthostatic hypotension or even mention blood pressure drops / orthostatic hypotension. Therefore I am not convinced that the proposed rationale for not including the CoP data collected between 0-30s is adequate. Secondly, according to Figure 3, a significant proportion of participants who experience OH do so during the first 30 s following standing up. Finally, the present results appear to be in contrast with Helterachi et al (2002) who reported that prospective falls in older people were associated with a decrease in blood pressure and unstable systolic blood pressure response following upright tilt. Therefore, could it be that the loss of balance leading to a fall occurs in the first 30 s upon standing? Yet, the first 30 s after standing were not analyzed in the present study. I believe that this is a limitation that should be outlined.

I appreciate that it is important to report null findings but I feel that the results could be presented in a more concise manner; some of the tables are not necessary and make the paper difficult to follow- please see my specific comments.

Did any of the participants report feeling dizzy or unstable once upright? Did any of the participants report having a fall due to a black out, faint or an unexplained fall in the past 12
months? If so did these participants differ in any way in their centre of pressure versus blood pressure relationships?

Minor comments

Abstract

Methods: replace "chance" with "change". Be more specific about which measure of centre of pressure movement was investigated. Conclusion: I think the sentence should read "understanding of the relation [...]nor the diagnostic [...]".

Introduction

Lines 17-20, page 4: the references cited to support the statement that "OH is significantly associated with impaired standing balance in older adults" should be revised. Both are reviews which do not make mention of this "significant relationship". "Blood pressure" or "orthostatic hypotension" are not mentioned in the paper by Sturnieks et al (2008). Those terms are only mentioned in the context of falls in the Rubenstein review paper. The authors should provide accurate references to support their statement.

Lines 34-37, page 4: "increased CoM movement during stance in community-dwelling older adults and PD with OH": was it compared to samples without OH? Age-matched?

Methods

Line 46, page 8: what marked the onset of the CoP recordings: full body weight on the force plate, according to the vertical ground reaction force trace?

Did any participant lose their balance or step when first stood up by the chair within or beyond the first 30 s?

Tables

I do not think that Tables 2 and 3 (displaying a large range of correlations that were performed) are necessary. These tables could be replaced with couple of sentences presenting the range of r values.

Table 2: It is unclear what is meant by "15 s after" and "15 s before" in the caption- is it before and after what maximum BP change too?
Table 4: regarding the maximum centre of pressure movement, is it in the ML or AP direction? The caption is unclear.

Figure 1: this figure is unnecessary. The protocol is simple and clear enough.

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

Yes

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

Yes

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

Yes

**Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?**
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

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Please indicate the quality of language in the manuscript:

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