Electrical vestibular stimulation (EVS) can be used to assess the vestibular control of standing balance. When applied as a noisy input, linear system identification techniques can quantify the relationship between the input EVS and the output postural responses. In the present study, we examined the linearity of the EVS-evoked responses and the threshold at which noisy EVS stimulation elicits anterior-posterior (AP) whole-body acceleration during quiet standing balance. Ten healthy participants were exposed to noisy EVS applied to their mastoid processes while quietly standing on a force plate with their head turned 90 degrees to the left. The peak-to-peak amplitude of the EVS was varied randomly between trials (0 to 5mA). We estimated the EVS-evoked whole-body responses using coherence between EVS and AP whole-body acceleration in the 1-10Hz frequency band. Coherence is a measure of the linear relationship between two processes across various frequencies, with 0 indicating no correlation and 1 indicating a perfect linear relationship. The amplitude of the EVS evoked whole-body responses exhibited a linear relationship with stimulation intensity (r=0.49, p=0.003). We observed a threshold of 1mA to elicit whole-body responses to EVS. The linearity of the EVS-evoked whole-body responses supports the use of linear techniques to analyze responses to noisy EVS delivered at levels above the identified 1mA threshold.

Themes:
Check (highlight) the most applicable theme according to the abstract.

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<thead>
<tr>
<th>Innovation and Technology</th>
<th>Health and Wellness</th>
<th>Culture and Society</th>
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Comments:
The abstract will be easier to follow if the author includes a clear statement of the research gap (i.e. what is not known about EVS and vestibular control) and why addressing the research gap is important before introducing the research goal. A daily life example of what anterior-posterior whole-body acceleration is like will be incredibly helpful for your readers to visualize what it is. The measure Coherence is nicely defined but it is unclear how the results (amplitude) correspond to coherence. If they are the same thing, using the same terminology will help. Please also include a discussion on the implication of the results.