

# Effects of a Single Electrical Stimulation Session on Foot Force Production, Foot Dome Stability, and Dynamic Postural Control

Dear Editor:

With great respect, we have read the article by Tourillon et al entitled "Effects of a Single Electrical Stimulation Session on Foot Force Production, Foot Dome Stability, and Dynamic Postural Control."<sup>1</sup> This work on using electrical stimulation to provoke immediate changes in the foot arch and dynamic balance shows great potential for clinical applications. Thus, we would like to comment on the work and guide future research on this topic.

Tourillon et al researched the effect of 20 minutes of electrical stimulation on foot force production, foot dome stability, and dynamic postural control.<sup>1</sup> They found that this intervention led to significant improvements in dynamic stability compared with the control group. Although this result shows hope for this intervention, further consideration should be given to the population, the mechanism of the intervention, and clinical significance to bring its potential to fruition.

First, we would like to suggest that the participants be more restricted in age and body mass index range for a study involving dynamic balance. These are factors shown to affect dynamic balance.<sup>2,3</sup>

Though the *t* test indicated that randomization resulted in no difference between groups, it does not elucidate within-group differences. Electrical stimulation may have a uniform effect on the individual, regardless of age or body mass index; a more formal analysis would provide clinically significant information as to the optimal demographic to receive electrical stimulation.

Second, the electrical stimulation treatment may evoke a great deal of proprioceptive input, which may have been partially responsible for the increased postural control.<sup>4,5</sup> This could be parsed either by applying a more active and stimulating control or by measuring the characteristics of the muscles of interest. Tools such as electromyography to measure the electrophysiological data or myotonometry to measure the tissue stiffness, tone, and elasticity would provide more information as to the mechanism of improvements in dynamic postural stability.

Lastly, given how novel and exciting the results of this study were, it is surprising that no clinically significant conclusions could be drawn. This reveals a deficit in studies comparing dynamic postural stability with fall rates in the elderly, injury rates in athletes, and reinjury rates postsurgery. If current

measures of dynamic postural control cannot be used to show the 5% to 10% change in outcomes of interest that are required for clinical significance, we would suggest follow-up studies to fill this gap.

The authors created a study that was an impressive use of electrical stimulation in people with pronation. Future researchers should focus on delineating the populations for whom this could be an effective treatment, connecting measures of dynamic postural control with clinical outcomes, and evaluating more tissue information to discover the mechanism of action behind this intervention.

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Editor's note. The authors declined to respond to this letter.