

Does Galvanic Stimulation Has Really A Sustained Effect On Postural Stability And Vestibular Reflexes

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Objectives: Examine the duration of the effect of GVS on postural sway. A second objective, was to assess the influence of GVS on vestibular reflexes.

Background: Galvanic vestibular stimulation (GVS) has recently been demonstrated to increase excitability of some vestibular reflexes, which could be in line with the observed effects on postural stability. Indeed, a few authors measured an enhancement of postural control during GVS in normal healthy adults, healthy elderly and patients with bilateral vestibular loss. To our knowledge, only one study supported a sustained effect of GVS. However, this study can inform us if this effect is entirely due to stimulation or if it is only a learning effect because of the absence of a sham condition.

Methods: 35 healthy participants (21 aged between 20-39 years old; 14 aged 50 years old and above) were assessed on two separate sessions. The first session (baseline), participants underwent cVEMP, oVEMP, vHIT) and postural evaluation. The second session, participants received either a sham or GVS (1mA) for a period of 30 mins and repeated vestibular and postural evaluations at three different time points: 1) during, 2) immediately following (T0) and 3) an hour after T0 (T1). For postural control, the parameters evaluated were: sway area, sway velocity and path. For VEMP, peak-peak amplitudes, latencies, thresholds and asymmetry were analyzed. Finally, for vHIT, instantaneous gain at 40, 60 and 80 msec were analyzed.

Results: There was no significant difference for sway parameters between groups for the different time points following stimulation. Moreover, no significant effect of stimulation vs sham was observed on any of the vestibular evaluations (cVEMP, oVEMP, vHIT).

Conclusions: This study does not support a prolonged effect of GVS for postural sway and no significant impact on vestibular reflexes. However, further studies should assess the effect of current density.