D4 Finding balance with vestibular stimulation

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Weakening of the vestibular system through disease or aging leads to imbalance, restricted mobility, and falls (Hain et al., 2018). Vestibular weakness affects one-third of people over the age of 40, and 85% of those over 80 years (Agrawal et al., 2009). The delicate cells of the vestibular system do not regenerate and thus it becomes an incurable chronic condition. A promising treatment is noisy galvanic vestibular stimulation (nGVS), a non-invasive electrical stimulation, delivered to the vestibular system, aiming to restore absent vestibular information and improve balance (McLaren et al., 2022). This presentation reports the results of a scoping review investigating the stimulation parameters that can be manipulated to improve the efficacy of nGVS. A comprehensive systematic search of five databases up to December 2022 identified studies applying nGVS to people with the aim of improving their postural control. Two independent reviewers screened and identified eligible studies and extracted parameter data. Thirty-one studies met the eligibility criteria. The review identified that a broad array of settings have been employed across studies. The nGVS parameters of waveform, amplitude, frequency band, duration of stimulation, method of amplitude optimization, size and composition of electrodes and the electrode skin interface are all likely to influence the efficacy of nGVS. However, the ability to draw robust conclusions about the selection of optimal nGVS parameters is hindered by a lack of studies that directly compare parameter settings. I propose a guideline for the accurate reporting of nGVS parameters. This will help establish standardized stimulation protocols bringing us one step closer to becoming a readily available clinical treatment.

Keywords
vestibular rehabilitation; balance; neuromodulation; noisy galvanic vestibular stimulation; nGVS; physiotherapy

References

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