E-Poster

EP-547

Prolonged Focal Vibration in Poststroke Gait Recovery: Where Do We Stand?

Topic: Physical Modalities

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BACKGROUND

Focal vibration has the potential to trigger both acute and chronic neuromuscular adaptations in healthy individuals through Ia afferent stimulation, impacting both spinal and cortical levels. As a form of somatosensory stimulation, prolonged focal vibration (PFV, 30 minutes) is emerging as a promising therapeutic approach, particularly for stroke survivors. When applied to upper and/or lower limb muscles or tendons, PFV has shown beneficial effects on balance, motor function and spasticity in neurorehabilitation. It can be used concomitantly with movement execution or before rehabilitation sessions, with proven documented residual effects after repeated applications. Additionally, PFV is well tolerated, with minimal adverse events reported in the literature.

METHODS

Since gait speed and ambulatory limitations are key predictors of social participation post-stroke, targeting ankle dorsiflexor strength -a major determinant of gait speed- is crucial. Furthermore, the early subacute phase (< 3 months) represents a critical window for neuroplasticity, where targeted stimulation may enhance functional recovery. Our overall project investigates the potential benefits of PFV for motor recovery in subacute stroke survivors with gait impairments.

RESULTS

In an initial pilot study (NCT04737018) including 16 subacute hemiplegic individuals (58.8 years ± 13.5, delay since stroke delay 38 days ± 11), PFV was applied to ankle dorsiflexors (100 Hz, 1 mm, 20 sessions) and led to an average tibialis anterior strength increase of +1.75 (muscular annual testing /5) in the PFV group (vs 0.88/5, in the sham group), while overall lower limb spasticity decreased by -0.63 (modified Ashworth scale /5) (vs +2.5/5), after one month of intervention.

A subsequent study (NCT05945212) aims to assess PFV's superiority over sham sessions in improving gait speed over two months, with measurements combining neurophysiological and clinical assessments.

Currently, few studies have explored PFV's impact on walking abilities. However, the previously reported benefits on motor function and spasticity reduction align with our hypothesis, which remains to be confirmed.

CONCLUSION

PFV appears to be a safe and noninvasive bottom up technique with potential for lower limb neuromotor recovery. However, further evidence is needed before is as an adjunct therapy in post-stroke gait rehabilitation, including home-based protocols.

Statement of Disclosures

None

Doi: 10.5606/archisprm.2026.EP-547

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