WHOLE LIMB VIBRATION FACILITATES MAGNETIC EVOKED POTENTIAL (MEP) RESPONSE
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BACKGROUND
- Neuromodulatory interventions have the potential to improve functional outcomes in patients with upper motor neuron disease.
- Muscle tendon vibration at frequencies >30 Hz increase the Magnetic Evoked Potential (MEP) response in target muscles, as demonstrated in prior studies.
- Effects are persistent for at least 60 minutes based on prior work, suggesting that vibration may potentiate neuroplasticity.

OBJECTIVES
The purpose of this study is to determine the short-term effect of whole limb vibration on cortico-spinal tract excitation as measured by the amplitude of the MEP using Transcranial Magnetic Stimulation (TMS).

METHODS
- Five healthy subjects had resting and post-vibration MEPs measured at the extensor digitorum communis (EDC).
- The EDC primary motor area (M1) was the location with the largest average MEP found using the Brainsight (Rogue Research, Inc. Montreal, Canada) TMS neuronavigation suite on a 1 cm grid.
- The Resting Motor Threshold (RMT) was defined as the lowest pulse intensity that produced a 50 uV MEP in 5 of 10 stimuli. The average of 10 MEPs was obtained at 130% of RMT.
- Subjects then underwent upper limb vibration with a Wave ProElite (Wave Manufacturing, Inc. Windsor, Canada) at 2 mm amplitude, 35 Hz, for 15 seconds, with 15 seconds of rest, for 3 cycles.
- Subsequent averages of 10 MEPs were acquired every 10 minutes up to 60 minutes.

RESULTS
- Analysis was performed using Repeated Measures Analysis of Variance (ANOVA) with Dunnett’s test to compare responses at each time interval versus the control.
- Statistically significant differences were seen between responses at 30 minutes compared to baseline with a 0.43 mV difference of means (one-sided 95% CI lower limit = 0.013 mV).
- Other time intervals had non-statistically significant differences of means. Residuals were normally distributed.

CONCLUSIONS
- Whole limb vibration resulted in increased MEP amplitudes at 30 minutes after treatment, suggesting increased cortico-spinal tract excitation over a sustained period of time.
- Additional subjects should be studied to determine the optimum period of excitation, and findings should be confirmed in subjects with upper motor neuron disease.

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REFERENCES