ABSTRACT OF THE MONTH

APTANJ Neurology Special Interest Group

Citation:
Bochkezanian V et al. Effect of tendon vibration during wide pulse neuromuscular electrical stimulation (NMES) on muscle force production in people with spinal cord injury (SCI). *BMC Neurology*. 2018;18:17. https://doi.org/10.1186/s12883-018-1020-9

Purpose

The purpose of this study was to assess if patellar tendon vibration superimposed onto wide-pulse width NMES elicits a greater peak muscle force with less muscle fatigue compared to just NMES without vibration.

Methods

Nine total subjects with complete and incomplete spinal cord injuries from Spinal Cord Injuries Australia Activity-based therapy exercise program "NeuroMoves" and the Perth community were recruited. All participants had a SCI for 6 months or more. All participants received medical clearance prior to participation in the study.

Discussion

The ultimate finding in this study, which focused on the effects of superimposing patellar tendon vibration with NMES versus NMES alone for muscle torque and/or fatigue, was that the positive responders to the vibration had a greater torque-time integral at the point of fatigue. There was no statistically significant difference between groups for the participants that did not respond to patellar tendon vibration as effectively as their counterparts. Based on the results of this study, the "completeness" of the injury did not appear to be a major factor in influencing response to patellar tendon vibration; therefore it is not clear at this time which patients with a SCI would be the most optimal candidates.

Summary and Recommendations

In this study, participants attended 1 sessions a week for 4 weeks with 7 days in between each session, with one groups receiving NMES only and the other receiving NMES plus patellar tendon vibration. Based on the results of this study, it is unclear which exact SCI population will benefit, but it appears that if a subject responds well to patellar tendon vibration that superimposing with NMES may be beneficial for increasing quadriceps muscle torque. Participants that do not respond well to vibration may just benefit from NMES. More research has to be completed with this intervention specifically in order to allow for optimal decision making with in the clinic.

Clinical Questions

1. Do you think that if the population size was larger and only consisted of incomplete injuries it would have made a difference in the outcomes?
2. Would the level of the injury (upper motor neuron versus lower motor neuron) make an impact on the effects of both NMES and PTV?
3. How would you modify this study in the future to allow for more precise replication in the clinic?