Differential effects of non-invasive brain stimulation in chronic neuropathic pain: Preliminary findings of an ongoing double-blind randomized control

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Abstracts will be considered for both poster and platform presentations

Neurotherapeutics

ABSTRACT BODY:
Objective: Determine and compare the anatomical site-specific effects of transcranial direct current stimulation (tDCS), a form of non-invasive brain stimulation, on chronic neuropathic pain and associated quality of life
Design: Randomized, double-blinded, controlled study
Setting: Outpatient Neurorehabilitation Research Clinic
Participants: 9 subjects diagnosed with chronic neuropathic pain (7 subjects with complex regional pain syndrome and 2 subjects with pain associated with spinal cord injury).
Interventions: Subjects received 10 consecutive weekdays of tDCS. Each subject was randomly assigned to receive tDCS at 1 of 3 anatomical sites: 1) primary motor cortex (M1); 2) dorsolateral prefrontal cortex (DLPFC); or 3) sham tDCS.
Main Outcome Measures: Visual Analog Scale (VAS) and SF-36 Health Survey at pre-intervention, midpoint (i.e., after 1st week), and post-intervention.
Results: On the physical component of SF-36, the M1 group had greater improvement compared to the DLPFC and sham groups. On the mental component of SF-36, the DLPFC and sham groups had greater improvement than the M1 group. On the VAS, the M1 group yielded greater improvement than DLPFC and sham groups.
Conclusions: There are differential effects of tDCS on chronic neuropathic pain according to neuroanatomical site of stimulation. The most improvement on the physical component of SF-36 Health Survey and VAS occurred with M1 stimulation. More improvement on the mental component of SF-36 occurred with DLPFC stimulation and sham stimulation compared with M1 stimulation. In sum, tDCS to M1 might be optimal to improve pain as measured by physical components of SF-36, while tDCS to DLPFC might have the most efficacy to improve mental aspects of pain. Future studies are recommended to build on these results, in part because these results show high variability.
Level of Evidence: Level II
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