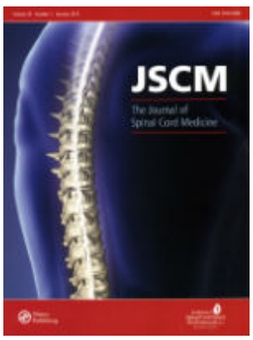

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Letter to the Editor

Feasibility of remotely-supervised tDCS in a person with neuropathic pain due to spinal cord injury

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Dear Editor:

Nearly 40% of people with spinal cord injury (SCI) report neuropathic pain that is often refractory to medications.[1,2] Substantial research has shown that anodal transcranial direct current stimulation (tDCS) over the motor cortex can induce clinically significant pain relief in chronic pain.[3–6] However, these clinical trials often require multiple study visits per trial and are associated to poor adherence to the study protocol. For instance, in our recent tDCS study in SCI, only 7 participants from the initial 46 that were enrolled completed the study.[7] In fact, despite all attempts to improve adherence, such as flexibility to schedule sessions, free parking and follow-ups by the phone, most participants ended up dropping out from the study.

Since many people with SCI have limited mobility, alternatives for home-based care are needed. Here we report the feasibility of supervised home-based tDCS application in a 57-year old woman with tetraplegia and sublesional neuropathic pain secondary to SCI since 2012. At time of enrollment, she self-reported pain as being 9 out of 10 in a visual analogue scale.

After enrollment, the participant and her caretaker were trained for the tDCS self-administration, using a remote controlled tDCS device (Neuroelectrics Starstim with NIC-home). Stimulation parameters were the same previously used.[6,8] The first session of tDCS took place on-site, and the principal investigator and research team ensured that the participant was comfortable with the sensation of stimulation. The remainder 4 sessions of stimulation occurred in the subject's home, under the remote supervision of research team personnel via an internet communication system (providing real time information about the tDCS administration).

Any unanticipated problems were discussed with the participants and adverse effects questionnaire was applied after every session. One follow-up visit (one week post stimulation) occurred on-site to assess the feasibility of home-based-tDCS.

All the 4-remote supervised sessions were successfully conducted. TDCS was generally well tolerated by the participant, consisting of only minor and transient adverse effects such as scalp burn sensation, tingling, and skin redness. Participant and her caretaker did not report any difficulties setting up the device and the stimulation, nor significant burden increase in patient́s daily life and acknowledged that the remote supervision grant them additional security.

There were no worsening of the clinical symptoms (BPI average pain severity decrease from 7 at baseline to 6.25 and from 9 to 8 in the VAS). According to the telemedicine usefulness and satisfaction questionnaire, the participant reported that the system was very useful and easy to

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perform, and that she would use this system again in the future to help her managing her pain at home.

Currently, a small number of studies have tested remotely supervised tDCS[9,10] and showed that this technique is rather safe and feasible. Our report reinforces the advantages of the remote supervision and that tDCS can be effectively applied at home providing an alternative pain treatment for SCI subjects, however to be truly portable and not depending of a caregiver new systems with better electrode positioning system needs to be developed.

Disclaimer statements

Contributors None.

Conflict of Interest The authors are responsible for the content and writing of this letter. The authors declare that there is no conflict of interest.

Ethics approval None.

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