Effect of Anodal Versus Cathodal Transcranial Direct Current Stimulation on Stroke Rehabilitation: A Pilot Randomized Controlled Trial


Abstract:

Objective. We compared the long-term effect of anodal versus cathodal transcranial direct current stimulation (tDCS) on motor recovery in patients after subacute stroke. Methods. Forty patients with ischemic stroke undergoing rehabilitation were randomly assigned to 1 of 3 groups: Anodal, Cathodal (over-affected and unaffected hemisphere, respectively), and Sham. Each group received tDCS at an intensity of 2 mA for 25 minutes daily for 6 consecutive days over of the motor cortex hand area. Patients were assessed with the National Institutes of Health Stroke Scale (NIHSS), Orgogozo’s MCA scale (OMCASS), the Barthel index (BI), and the Medical Research Council (MRC) muscle strength scale at baseline, after the sixth tDCS session and then 1, 2, and 3 months later. Motor cortical excitability was measured with transcranial magnetic stimulation (TMS) at baseline and after the sixth session. Results. By the 3-month follow-up, all groups had improved on all scales with P values ranging from .01 to .0001. Improvement was equal in the Anodal and Cathodal groups. When these treated groups were combined and compared with Sham, significant interactions were seen for the OMCASS and BI scales of functional ability (P = .002 for each). There was increased cortical excitability of the affected hemisphere in all groups with the changes being greater in the real versus sham groups. There were borderline significant improvements in muscle strength. Conclusion. A brief course of 2 types of tDCS stimulation is superior to sham stimulation in enhancing the effect of rehabilitation training to improve motor recovery after stroke.

Keywords:

stroke rehabilitation, transcranial direct current stimulation, motor threshold

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