Combined effects of transcranial direct current stimulation (tDCS) and transcutaneous spinal direct current stimulation (tsDCS) on robot-assisted gait training in patients with chronic stroke: A pilot, double blind, randomized controlled trial.

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Abstract

PURPOSE: Preliminary evidence has shown no additional effects of transcranial direct current stimulation (tDCS) on robotic gait training in chronic stroke, probably due to the neural organization of locomotion involving cortical and spinal control. Our aim was to compare the combined effects of tDCS and transcutaneous spinal direct current stimulation (tsDCS) on robotic gait training in chronic stroke.

METHODS:

Thirty chronic stroke patients received ten 20-minute robot-assisted gait training sessions, five days a week, for 2 consecutive weeks combined with anodal tDCS + sham tsDCS (group 1; n=10) or sham tDCS + cathodal tsDCS (group 2; n=10) or tDCS + cathodal tsDCS (group 3; n=10). The primary outcome was the 6-minute walk test (6MWT) performed before, after, 2 weeks and 4 weeks post-treatment.

RESULTS:

Significant differences in the 6MWT distance were noted between group 3 and group 1 at the post-treatment and 2-week follow-up evaluations (post-treatment P=0.015; 2-week follow-up P=0.001) and between group 3 and group 2 (post-treatment P=0.010; 2-week follow-up P=0.015). No difference was found between group 2 and group 1.

CONCLUSIONS:

Our preliminary findings support the hypothesis that anodal tDCS combined with cathodal tsDCS may be useful to improve the effects of robotic gait training in chronic stroke.