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Cognitive Impairment Rehabilitation after Middle Cerebral Artery Stroke Using Transcranial Direct Current Stimulation: An Exploratory Study

TRABAJO FIN DE MÁSTER

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Se presenta una versión resumida del documento dado que el original contiene información confidencial.

ABSTRACT

Introduction. Around 40% of stroke survivors have cognitive impairment (CI) that affects quality of life. Lately, non-invasive brain stimulation (NIBS) techniques have become a major focus of research in the field of neurorehabilitation. Transcranial direct current stimulation (tDCS) has been investigated in poststroke motor recovery. However, its effects over cognitive recovery are still uncertain.

Objectives. The main objective of this clinical trial is to figure out the effects of stimulating ipsilesional dorsolateral prefrontal cortex (iDLPFC), contralesional anterior cerebellar lobe (contra-CEREB) or the combination of both (iDLPFC + contra-CEREB) by high-density tDCS (HD-tDCS) administration in cognition, in middle cerebral artery (MCA) subacute stroke patients, and if there are any physiological changes in the brain. Results are compared to sham stimulation controls.

Method. HD-tDCS was applied to 25 participants using the Starstim 8 device (Neuroelectrics, Barcelona) during 10 sessions of 20 minutes each. Cognitive performance was assessed by the Montreal Cognitive Assessment (MoCA) test. A resting-state electroencephalography (RS-EEG) was registered at pre- and post-treatment and follow-up evaluations.

Results. Combined stimulation group had the highest cognitive enhancement, although no significant differences with other groups were found. All groups increased their cognitive performance at the end of the study. Brain activation patterns turn more stable and localized as time goes by. Theta bands correlated the most with the cognitive variables.

Conclusions. Results cannot be generalized and are not reliable, as sample size is too small yet. Although, combined stimulation may be the best treatment option for CI.

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