

EFFECTS OF COGNITIVE TRAINING AND TRANSCRANIAL DIRECT CURRENT STIMULATION ON WORKING MEMORY OF PATIENTS WITH TREATMENT-RESISTANT SCHIZOPHRENIA: A DOUBLE BLIND, RANDOMIZED, SHAM-CONTROLLED STUDY PROTOCOL

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Background: Working memory (WM) impairment is often found in patients with treatment-resistant (TR) schizophrenia and substantially affects their social functioning and quality of life (de Bartolomeis et al. 2013). Dorsolateral Prefrontal Cortex (DLPFC) embodies computational mechanisms for monitoring and manipulating items in WM. Transcranial direct current stimulation (t-DCS) is a noninvasive brain stimulation technique inducing small changes in membrane potentials that in turn influence the frequency of spike timing and modify net cortical excitability. Recent studies demonstrate that t-DCS on DLPFC in combination with Cognitive Training (CT) can improve working memory in healthy subjects and clinical population. Patients with TR schizophrenia have more robust cognitive impairment than non-TR subjects across several domains like selective attention, cognitive flexibility, processing speed, executive functions, verbal fluency (Frydecka et al. 2016).

Methods:

- Twenty patients with TR schizophrenia will be randomly assigned to receive one session of either active or sham tDCS (2 mA for 20 minutes, anode in F3, cathode in F4) in combination with cognitive training using the Sternberg's task. After two weeks, patients who received the active stimulation will undergo sham stimulation and the viceversa.
- All participants will be assessed with PANSS (Positive and Negative Syndrome Scale), MINI (Mini-International Neuropsychiatric Interview), and SCID-5 (Structured Clinical Interview for DSM V) at the beginning of the study.
- Before and after each stimulation, BACS (Brief Assessment Cognitive Schizophrenia), DSST (Digit Symbol Substitution Test), and N-BACK will be administered to evaluate WM functions.
- Patients with active implantable devices (e.g. pacemaker, intracranial electrodes, implantable defibrillator, cochlear implant), neurological disorders, and drug abuse in the previous six months will be excluded.
- Throughout the duration of the study, the pharmacological treatment will not be modified and will be the same of the previous two months.

Conclusion: This is the first study aiming to assess the potential role of combining t-DCS and CT for improving WM performance in patients with TR schizophrenia.

References:

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2. Frydecka D, Beszlej JA, Gościmski P, Kiejna A, Misiak B: *Profiling cognitive impairment in treatment-resistant schizophrenia patients. Psychiatry Res 2016; 235:133-8. doi: 10.1016/j.psychres. 2015.11.028. Epub 2015 Nov 18. PMID: 26706131*

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ETHNICITY-DEPENDENT RESPONSE TO dTMS TREATMENT

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Background: There are not many studies on ethnicity-dependent response to dTMS treatment. This study was conducted to identify whether there are differences in outcomes between deep Transcranial Magnetic Stimulation (dTMS) treatments for South Asians compared to Caucasians.

Methods: 16 age- and gender-matched patients (8 South Asian, 8 Caucasian) who completed a full treatment course (36 treatments), were compared using their self-reported baseline (1st treatment) and end (36th treatment) scores on the Patient Health Questionnaire-9 (PHQ-9), the Quick Inventory of Depressive Symptomatology (QIDS-SR-16), Generalized Anxiety Disorder Assessment (GAD-7), and Quality of Life Enjoyment and Satisfaction Questionnaire - Short Form (Q-LES-Q-SF). All patients were treated within the past two years at a private TMS clinic in San Diego, California, USA.

Results: For Caucasians, the average difference for PHQ-9, QIDS-SR-16, GAD-7, and Q-LES-Q-SF between baseline and end scores was 11.25, 5.56, 8.88, and 13.88, respectively. In comparison, for South Asians, the average differences between baseline and end scales for PHQ-9, QIDS-SR-16, GAD-7, and Q-LES-Q-SF were 11, 10.20, 9.94, and 12.63, respectively. The average baseline scores for Caucasians were 19.75, 18.375, 16.625, and 40.875 vs. average end scores of 8.5, 12.81, 7.75, and 54.75. For South Asians, the average baseline scores were 17.25, 17.57, 16.25, and 44.38 vs. average end scores of 6.25, 7.38, 6.31, and 57.

Conclusions: It is promising to see that interventional methods may be able to overcome differences in ethnicity-dependent variability in metabolism and response to psychopharmacologic treatments. For example, in comparison to Caucasians, South Asians had a larger clinical decrease in QIDS-SR-16 scores despite a greater baseline average. These results may help show that despite destigmatization efforts, interventional methods may provide care in minority groups, adjunctive to or in place of certain pharmacological options that are known to be less effective or provide greater side effects in some minority groups.

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A SINGLE PSYCHOEDUCATIONAL SESSION INCREASES ACCEPTABILITY TOWARDS TRANSCRANIAL DIRECT CURRENT STIMULATION (tDCS) IN TREATING ANXIETY DISORDERS

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Objective: In this study we sought to investigate the acceptability of transcranial direct current stimulation (tDCS) in treating anxiety disorders. We studied the impact of a psychoeducational session on acceptability as defined by a multidimensional framework employing a novel self-report questionnaire we developed, the ACCEPT-tDCS.

Method: A cross-sectional study was conducted, aiming at observing the impact of a psychoeducational session on tDCS acceptability in treating anxiety disorders. Our sample was comprised of 536 participants.

Results: After a single psychoeducational session - administered via informative video - the acceptability of our sample towards the use of tDCS in treating anxiety disorders increased significantly. Also, the questionnaire we developed showed adequate psychometric properties.

Conclusions: This work has shown that a single psychoeducational session increased participants' acceptability towards tDCS, which highlights the importance of providing adequate knowledge about tDCS and other new and emerging interventions to promote a subsequent successful implementation of novel health interventions within health care provisioning systems. It has also shown that the ACCEPT-tDCS is an adequate tool to measure acceptability towards tDCS in anxiety disorders, and an added value both for clinical and research contexts.

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