cognitive/speed variables and ROI HbO data were applied using a Bonferroni adjustment for multiple comparisons.
Results: Subjects with missing cognitive data were excluded from analyses, resulting in sample sizes of 18 for the single-task cognition, dual-task overground walking, and dual-task treadmill walking conditions. During dual-task overground walking, there was a significant positive correlation between walking speed and relative change in HbO in RMSF [r(18)=.51, p<.05] and RM [r(18)=.53, p<.05)]. There was a significant negative correlation between total number of correct subtractions and relative change in HbO in LMSF ([r(18)=-.75, p<.05] and LM [r(18)=-.52, p<.05] during dual-task overground walking. No other significant correlations were identified.
Conclusions: These results indicate that there is lateralization of the cognitive and motor components of overground dual-task walking. The right hemisphere appears to be more active the faster people walk during the dual-task. By contrast, the left hemisphere appears to be less active when people are working faster on the cognitive task (i.e., serial-3 subtraction). The latter results suggest that automaticity of the cognitive task (i.e., more total correct subtractions) is related to decreased brain activity in the left hemisphere. Future research will investigate whether there is a change in cognitive automaticity over trials and if there are changes in lateralization patterns in neurodegenerative disorders that are known to differentially affect the hemispheres (e.g., Parkinson's disease).

Categories: Neurophysiology/EEG/ERP/fMRI
Keyword 1: neuroimaging: functional
Keyword 2: laterality
Keyword 3: movement
Correspondence: Rini I. Kaplan Boston University kaplanri@bu.edu

66 Tolerability of HD-tDCS at Total Amplitudes of 2mA to 10mA in Older Adults

Ashley Harrie[1], Carine El Jamal[1], Michael Padgett[1], Annalise Rahman-Filipiak[1], Benjamin M Hampstead[1,2]
[1]Research Program on Cognition and Neuromodulation Based Interventions, Department of Psychiatry, University of Michigan, Ann Arbor, MI, USA. [2]Mental Health Service, VA Ann Arbor Healthcare System, Ann Arbor, MI, USA

Objective: High-definition transcranial direct current stimulation (HD-tDCS) is a non-invasive form of brain stimulation used to modulate neuronal activity in a brain region of interest. Growing research has shown that HD-tDCS is a promising treatment for cognitive decline in neurodegenerative disease. Most HD-tDCS studies have used amplitudes of 2mA or less, with little investigation into tolerability at greater intensities since anecdotal lore generally suggests them to be poorly tolerated. Therefore, we examined the tolerability of HD-tDCS and common side effect profile in older adults who received total amplitudes of 3mA to 10mA (delivered using multiple electrodes delivering 2-4mA). We developed a series of methods (e.g., participant instructions, task engagement, techniques to lower impedance) and hypothesized they would equate the experience between active and sham HD-tDCS. We also compared symptom endorsement between those receiving active stimulation at 3mA+ total versus those receiving 2mA or lower; again, hypothesizing no difference in reported symptoms.
Participants and Methods: 295 older adults (M_{age} = 71.12±9.42) (Normal Cognition = 75, Amnestic MCI [aMCI] = 172, Dementia of the Alzheimer's Type [DAT] = 27, Other = 21) were enrolled across six HD-tDCS studies. All participants received one to thirty 20- to 30-minute sessions of active or sham stimulation at total amplitudes between 2mA and 10mA. All participants completed a standardized side effect questionnaire after each session asking whether they experienced burning, tingling, itching, scalp pain, trouble concentrating, sleepiness, headache, mood changes, neck pain, skin redness, or any other symptoms. When symptoms were endorsed, participants rated the severity of the symptom (mild, moderate, severe).
Results: We used Fisher's Exact tests to compare the frequency and severity of side effects in active (3mA or higher) vs. sham stimulation. Those receiving sham were significantly more likely to report tingling than those receiving active HD-tDCS. Conversely, those receiving active stimulation more frequently endorsed mood changes and skin

https://doi.org/10.1017/S1355617723006161 Published online by Cambridge University Press

redness relative to the sham group, though moderate-severe ratings were endorsed in only 2.9% and 0.4% of the sessions, respectively. Relative to those receiving 2mA, participants receiving higher intensities of active stimulation experienced skin redness more frequently, whereas the 2mA reported higher frequencies of itching and scalp pain. A burning sensation was endorsed at equal rates between these groups; however, the higher intensity active group reported it as moderate or severe more frequently than the 2mA active group. Despite these minor differences, most side effects following 3mA+ were reported at low frequencies and were typically mild when endorsed.
Conclusions: Our findings demonstrate that HD-tDCS is well-tolerated for total amplitudes up to 10mA in older adults with little tangible difference in the reported experience relative to sham. Findings support the use of higher HD-tDCS amplitudes, at least when key methodological procedures are followed.

Categories: Neurostimulation/Neuromodulation
Keyword 1: neurostimulation
Correspondence: Ashley Harrie, Research Program on Cognition and Neuromodulation Based Interventions, Department of Psychiatry, University of Michigan, Arbor Lakes Building 1 Suite 2400, 4251 Plymouth Rd., Ann Arbor, MI 48105, USA. E-mail: harrieas@med.umich.edu

67 Blinding and Double-Blinding of HD-tDCS in Double-Blind, Randomized Controlled Trials

Ashley Harrie[1], Carine El Jamal[1], Michael Padgett[1], Annalise Rahman-Filipiak[1], Benjamin M Hampstead[1,2]
[1]Research Program on Cognition and Neuromodulation Based Interventions, Department of Psychiatry, University of Michigan, Ann Arbor, MI, USA. [2]Mental Health Service, VA Ann Arbor Healthcare System, Ann Arbor, MI, USA

Objective: High-definition transcranial direct current stimulation (HD-tDCS) is a non-invasive brain stimulation technique shown to modulate neuronal networks. In order for HD-tDCS to be used in randomized, placebo-controlled clinical trials, it is critical to have methods that enable blinding. Some research has shown that sham stimulation is an effective blind in tDCS. However, few studies have investigated the double-blinding of HD-tDCS, especially at intensities greater than 2mA. We address this knowledge gap by examining the blinding and double-blinding of HD-tDCS among a mixed neurologic sample of older adults.
Participants and Methods: A sample of 240 older adults (M_{age} = 72.21±8.94) with various clinical diagnoses (Normal Cognition = 34, Amnestic MCI [aMCI] = 172, Dementia-Alzheimer's Type [DAT] = 27, Other = 7) were recruited through five double-blind, randomized controlled trials. All participants were stimulation naïve at their first session and received one to thirty sessions of 20- or 30-minutes of active (n=1472) or sham (n=681) stimulation at total amplitudes of 2mA, 4mA, or 6mA. At the start of each stimulation session, a study team member entered a code into the tDCS unit, and the electrical current was gradually ramped up to the specified (blinded) amplitude over a period of 30 seconds. The current remained at this level for the specified amount of time in the active condition (e.g., 20-minutes) but was ramped down over the next 30 seconds for those in the sham condition. This ramp up/down process was repeated in the final minute (e.g., 20th minute) in the sham session to provide both primacy and recency effects. After each active or sham session, participants were asked whether they received 'real' or sham stimulation. One study also asked a study team member if they believed the participant received real or sham stimulation at two primary outcome endpoints.
Results: We used Fisher's Exact tests to evaluate the efficacy of our blinding and double-blinding procedures. In stimulation naïve participants receiving their first session, there were no differences in accuracy, suggesting adequate blinding. We also examined participant blinding across all sessions to determine whether repeated HD-tDCS exposure might impact blinding. Across all sessions, participants in the sham condition were more likely to endorse being in the 'real' (active) condition, again suggesting adequate blinding. There were no significant group differences for active versus sham in the frequency of the study team correctly stating the participant's condition, suggesting sufficient double-blinding. No significant differences were found in study team blinding when data from the 2mA versus 4mA to 6mA were analyzed separately.

https://doi.org/10.1017/S1355617723006161 Published online by Cambridge University Press