

**Conclusions:** These results suggest that the HD-tDCS sham method is an effective blind and double-blind for HD-tDCS in clinical trials, even at total amplitudes as high as 6mA.

**Categories:** Neurostimulation/Neuromodulation

**Keyword 1:** neurostimulation

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## 68 Preliminary Evidence of a Therapeutic Effect of Electrical Neuromodulation on Cognitive Deficits in Patients with Mild Cognitive Impairment

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**Objective:** Episodic memory functioning is distributed across two brain circuits, one of which courses through the dorsal anterior cingulate cortex (dACC). Thus, delivering non-invasive neuromodulation technology to the dACC may improve episodic memory functioning in patients with memory problems such as in amnesic mild cognitive impairment (aMCI). This preliminary study is a randomized, double-blinded, sham-controlled clinical trial to examine if high definition transcranial direct current stimulation (HD-tDCS) can be a viable treatment in aMCI.

**Participants and Methods:** Participants and Methods: Eleven aMCI participants, of whom 9 had multidomain deficits, were randomized to receive 1 mA HD-tDCS (N=7) or sham (N=4) stimulation. HD-tDCS was applied over ten 20-minute sessions targeting the dACC. Neuropsychological measures of episodic memory, verbal fluency, and executive function were completed at baseline and after the last HD-tDCS session. Changes in composite scores

for memory and language/executive function tests were compared between groups (one-tailed t-tests with  $\alpha = 0.10$  for significance). Clinically significant change, defined as  $> 1$  SD improvement on at least one test in the memory and non-memory domains, was compared between active and sham stimulation based on the frequency of participants in each.

**Results:** No statistical or clinically significant change ( $N-1 \chi^2$ ;  $p = 0.62$ ) was seen in episodic memory for the active HD-tDCS ( $M_{Diff} = 4.4$ ;  $SD = 17.1$ ) or sham groups ( $M_{Diff} = -0.5$ ;  $SD = 9.7$ ). However, the language and executive function composite showed statistically significant improvement ( $p = 0.04$ ;  $M_{Diff} = -15.3$ ;  $SD = 18.4$ ) for the active HD-tDCS group only (Sham  $M_{Diff} = -5.8$ ;  $SD = 10.7$ ). Multiple participants (N=4) in the active group had clinically significant enhancement in language and executive functioning tests, while nobody in the sham group did ( $p = 0.04$ ).

**Conclusions:** HD-tDCS targeting the dACC had no direct benefit for episodic memory deficits in aMCI based on preliminary findings for this ongoing clinical trial. However, significant improvement in language and executive function skills occurred in response to HD-tDCS, suggesting HD-tDCS in this configuration has promising potential as an intervention for language and executive function deficits in MCI.

**Categories:** Neurostimulation/Neuromodulation

**Keyword 1:** treatment outcome

**Keyword 2:** technology

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## 69 Transcranial Random Noise Stimulation Facilitates Phonemic Verbal Fluency and Convergent Thinking in Multilingual Healthy Adults.

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**Objective:** The aim of the present study was to analyse the effects of the transcranial random noise stimulation (tRNS) technique when placed