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Verb Network Strengthening Treatment Combined with tDCS in Non-fluent Chronic Aphasia

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Introduction
Verb network strengthening treatment (VNeST) is an aphasia therapy aimed at improving word and sentence production [1]. Transcranial direct current stimulation (tDCS) is a safe non-invasive brain stimulation method that can potentially enhance the effect of language therapy [2]. The present study is the first to test the added benefit of combining VNeST with tDCS in chronic post-stroke aphasia.

Methods
Data collection is ongoing. So far, four Russian-speaking people with chronic non-fluent aphasia participated in the study: IIM (f, 42); KEA (f, 45); SYaV (m, 61); ShAE (m, 68). Participants received two sessions of VNeST per day for ten days over the course of two weeks. TDCS was delivered for 20 minutes at the beginning of only the first session each day via two sponge electrodes at 1.5 mA, with the anode over the intact perisylvian cortex (target selected based on MRI). There were two experimental groups with regard to the cathode positioning: contralaterally to the anode (SYaV, ShAE) versus over the left shoulder (IIM). One of the participants (KEA) recieved sham stimulation. Outcomes were tested with a custom action naming and sentence production tests that included trained and untrained verbs and the Russian Aphasia Test (RAT) [3].

Results
All participants improved significantly in sentence production. One participant improved significantly in action naming (KEA). Others also showed a numerical improvement although it did not reach significance. The overall score on the RAT did not improve significantly following therapy.

Conclusion
A combination of VNeST with tDCS in Russian-speaking people with chronic non-fluent aphasia showed promising results. All participants improved in sentence production. However, as data collection is ongoing, it is yet impossible to distinguish between the benefits of behavioral language therapy and tDCS. Further analysis will also explore differences in performance on trained and untrained items.

References
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