

Thursday, May 3rd, 2pm ET

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Effects of tDCS on Aphasia Treatment Outcomes: A Clinical Trial

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Aphasia is a debilitating language disorder for which behavioral speech therapy is the most efficient treatment, but therapy outcomes are variable and full recovery is not always achieved. It remains unclear if adjunctive brain stimulation (anodal [A]-tDCS) applied during aphasia therapy can improve outcome. We tested whether it is futile to study A-tDCS as an adjunctive intervention during speech therapy to improve speech production (naming) for subjects with chronic post-stroke aphasia. This was a double-blinded, prospective, randomized, controlled, clinical trial employing a futility design to test adjunctive A-tDCS during speech therapy. The study enrolled 74 patients with chronic (>6 months) aphasia due to one previous left hemisphere stroke. In comparing A-tDCS and sham tDCS, patients were matched based on site (University of South Carolina or Medical University of South Carolina), baseline age, type of aphasia and aphasia severity. All participants underwent aphasia treatment for 3-weeks (15 sessions; 45 minutes each) combined with either A-tDCS vs. sham tDCS applied to preserved left temporal lobe regions. The primary outcome was the ability to name common objects, assessed twice before and after therapy. The adjusted mean change from pre-treatment baseline in correct naming was 13.9 words (95% CI: 9.0, 18.7) for A-tDCS and 8.2 words (95% CI: 3.8, 12.6) for sham tDCS, with mean A-tDCS difference of 5.7 words (95% CI: -0.9 - 12.3), indicating a 70% increase in correct naming for A-tDCS relative to sham. The futility hypothesis p-value was 0.896, indicating failure to reject the null hypothesis, and, therefore, providing no evidence that further study of anodal tDCS is futile. We also completed one-tailed superiority analyses (A-tDCS>S-tDCS), which revealed greater overall improvement in naming associated with A-tDCS over S-tDCS for both trained ($t=2.35$, $p=.011$) and untrained items, ($t=1.74$, $p=.044$). Finally, the effects of BDNF genotype on treatment outcome were studied. Our findings provide evidence that A-tDCS may improve the outcome of aphasia treatment and motivate further study in this area.

This lecture will be held at the University of South Carolina:

Room #140, Discovery I, 915 Greene Street, Columbia, SC 29208

Date: Thursday, May 3rd, Time: **2pm – 3pm** Eastern Time

The event will be catered!

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