

the observation period was carried out according to the same criteria as the original one.

Results: Clinical trials showed that most children (78%) had increased SNS activity, which correlated with the severity of somatic manifestations. In all cases, the mental state of children was characterized by increased anxiety. After 2 weeks of complex therapy, recovery of vegetative regulation was observed in most children in the group with the use of electrical stimulation, in addition to improving the clinical condition. In accordance with the analysis of HRV data, the autonomic balance normalization was noted: the LF / HF ratio for the first group changed from 7.71 ± 4.54 to 5.82 ± 6.28 ; for the second group, it significantly decreases from 8.21 ± 5.82 to 2.12 ± 4.53 .

Keywords: non-invasive electrostimulation, autonomic nervous system, psychosomatic disorders

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COULD TDCS MODULATE BILINGUAL READING?

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Introduction: With increasing cultural diversity across the globe, bilingualism is becoming more of a norm. Reading in different languages includes both lexical (dorsal) and sublexical (ventral) neural pathways in varying degrees depending on the orthographic demands. However, the relative activity in these language networks within a bilingual brain is not well understood. We investigated how the respective languages are processed in Chinese-English bilinguals by modulating brain regions associated with each pathway through tDCS.

Methodology: In a double-blind, sham-controlled, within-subject design experiment, balanced bilinguals (validated by behavioral pilot testing) received anodal tDCS across 3 sessions administered on different days (2 active and 1 sham stimulation). An in-house computational modeling approach found two montages with (i) anode at CP5 and cathode at CZ, and (ii) anode at TP7 and cathode at nape of the neck, to be appropriate for stimulating the dorsal and ventral pathways, respectively. Participants read matched lists of English and Chinese words before and after dorsal, ventral and sham stimulation (6 equivalent lists per language). The order of dorsal, ventral, and sham stimulation, word lists, and languages were randomized and counterbalanced across participants. Linear mixed effect model analysis was performed on recorded reaction time for accurate trials. Fixed effects of type of stimulation, time, gender and language order, and random effects for items and subjects were applied.

Result: English was significantly modulated by dorsal stimulation whereas Chinese by both dorsal and ventral stimulation. Males had larger stimulation effects.

Conclusion: The tDCS manipulation showed that the cognitive resources utilized for the two languages are different. The findings suggest that in Chinese-English bilinguals, the sublexical pathway plays a prominent role in reading in both languages whereas the lexical pathway is particularly prominent in reading Chinese.

Keywords: tDCS, reading, bilingual, dual-route

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ABNORMAL BRAIN FUNCTIONAL CONNECTIVITY AFTER SUBCORTICAL STROKE: A TMS-EEG STUDY

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Introduction: Stroke causes the changes of whole brain network. TMS-EEG is an excellent tool to evaluate brain connection by stimulating one

brain area and then analyzing response in various areas. The present study evaluated the brain connection in patients with subcortical stroke by TMS-EEG.

Methods: Twenty-five patients with the first ischemic stroke in the left basal ganglia underwent TMS-EEG at 3 months after onset. Single-pulse TMS were delivered by a figure 8 coil over the bilateral DLPFC respectively, and EEG was recorded concurrently using a 64-channel EEG system. TMS evoked potential (TEP), event-related synchronization (ERS) and event-related desynchronization (ERD) were analyzed offline. TMS-EEG data from 25 age- and sex-matched healthy adults were taken as control.

Results: Abnormal brain responses evoked by right DLPFC stimulation were observed in patients with stroke, (1) the amplitude of P200 component of TEP in the central area was significantly decreased compared to the controls (6.0 ± 0.9 vs. 12.7 ± 1.1 μ V, *p* controls in the brain responses after left DLPFC stimulation).

Conclusion: TMS-EEG is a useful tool for evaluating brain functional connectivity in patients with stroke. Subcortical stroke caused changes in the whole brain functional connectivity, probably more serious in the contralateral hemisphere to the infarction.

Keywords:

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HD-TDCS IN PATIENTS WITH REFRACTORY LEFT FOCAL LTE: COGNITIVE PERFORMANCE

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Left focal LTE which is drug resistance causes cognitive disorders. This report focused on HD-tDCS in cognitive performances such as attention complex, working memory, and cognitive flexibility in these patients.

Ten participants for whom the epileptogenic local was determined by LTM and met the inclusion criteria were put in the experimental group. The stimulation was done by the HD-tDCS for 10 sessions, each session lasted 20 minutes. 2mA in the epileptogenic foci C3: cathode and Cz,T3,P3,F3: anode were done in 10-20 system. EEG, the tests of IVA+, n-back and Wisconsin card sorting test for evaluation of patients were done before and after the intervention and for one month-follow up.

Our study showed a significant increase in the number of correct responses and reaction time in the n-back test. And also a significant increase of performance in audio and visual selective, focused, sustained, divided, and alternative attention in +IVA test. The mean of the increase in the performance of patients in visual attention was more than audio attention. The evaluation of mean for visual and audio responses control increased significantly. Preservative errors from the results of Wisconsin in comparison to the mean decreased significantly. Also lasting effect after one month was significant.

We reported in our previous paper the mean seizure frequency changes that showed decrement by an average of 17.9% immediately, and increment by an average of 38.1% one month after the HD-tDCS. These changes were not significant statistically (*p*-value >0.05). (S.A. Karvigh at all,2017) Therefore according to the findings of this study, in these patients the cathodal HD-tDCS in epileptogenic foci can increase the performance of working memory, the attention complex, and cognitive flexibility. But about seizure control must be more cautious and more studies are needed.

Keywords: HD-tDCS, epilepsy, cognitive function, attention, working memory, executive function

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CLINICAL OBSERVATION OF SUBJECTIVE EFFICACY OF TRANSCRANIAL MAGNETIC STIMULATION IN PHARMACORESISTANT DEPRESSIVE EPISODES OCCURRING DURING VARIOUS MENTAL DISORDERS

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