

THE EFFECTS OF TRANSCRANIAL DIRECT CURRENT STIMULATION IN PATIENTS WITH AUTISM; A PILOT STUDY

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Background and objectives: Autism is a neurodevelopment disorder. The abnormal synaptic maturation and connectivity are the possible etiologies. There was a pilot study revealed the language acquisition improvement by transcranial direct current stimulation (tDCS) in autistic children. However, there is still no evidence about the effect of tDCS on autistic brain wave. Therefore, we aimed to study the effects of anodal tDCS on Childhood Autism Rating Scale (CARS) and peak frequency of power spectrum density (PSD).

Methods: Eight male autistic patients were identified according to DSM IV-TR. Inclusion criteria were 1) male; 2) age between 5 and 8 years; 3) diagnosed by a pediatric psychiatrist. Patients received 1 mA, 20 m anodal tDCS over the left dorsolateral prefrontal cortex (F3) and followed up at immediate post-treatment. Peak frequency of PSD and CARS were compared between before and after tDCS by paired t-test.

Results: The results showed a statistically significant increase in alpha frequency under the F3 (0.69, 95% CI 0.06 to 1.31, $p = 0.04$) while there was a trend to have a statistically significant reduction in CARS (-1.13, 95%CI -2.26 to 0.01, $p=0.05$). All patients tolerated the tDCS well without any serious adverse events.

Conclusion: Our study suggests that a single stimulation of anodal tDCS over the F3 may be a useful clinical tool in autism. We propose that the tendency of autistic clinical improvement may be caused by the increment of alpha activity leading to the better attention/concentration. However, the larger sample size may provide more precise outcomes.