Improving interference control in ADHD patients with transcranial direct current stimulation (tDCS)

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The use of transcranial direct current stimulation (tDCS) in patients with attention deficit hyperactivity disorder (ADHD) has been suggested as a promising alternative to psychopharmacological treatment approaches due to its local and network effects on brain activation. In the current study, we investigated the impact of tDCS over the right inferior frontal gyrus (rIFG) on interference control in 21 male adolescents with ADHD and 21 age matched healthy controls aged 13 to 17 years, who underwent three separate sessions of tDCS (anodal, cathodal and sham) while completing a Flanker task. Even though anodal stimulation appeared to diminish commission errors in the ADHD group, the overall analysis revealed no significant effect of tDCS. Since participants showed a considerable learning effect from the first to the second session, performance in the first session was separately analyzed. ADHD patients receiving sham stimulation in the first session showed impaired interference control compared to healthy control participants whereas ADHD patients who were exposed to anodal stimulation, showed comparable performance levels (commission errors, reaction time variability) to the control group. These results suggest that anodal tDCS of the right inferior frontal gyrus could improve interference control in patients with ADHD.