

**eP1640****The effect of transcranial direct current stimulation (tDCS) associated with hypocaloric diet in subjects with excessive weight**

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Background and aims: non-adherence to lifestyle modifications is an important determinant of failure to treat obesity. The dorsolateral prefrontal cortex (DLPFC) plays an important role in appetite and food intake regulation and may be a target for electric brain stimulation. The aim of this study was to test the effect of active anodal tDCS over the right DLPFC associated with a hypocaloric diet on weight loss in overweight or obese adults. Materials and methods: in this randomized, placebo-controlled, double-blind pilot study, 10 overweight or obese adults with different degrees of glucose tolerance (NGT: normal, IGM: impaired glucose metabolism, T2D: type 2 diabetes), aged 20-50 years, completed 20 sessions of fixed-dose tDCS (2mA, 20 min). Subjects were randomized to receive: (1) active a-tDCS + hypocaloric diet (Active), or (2) sham a-tDCS + hypocaloric diet (Sham), both delivered over the rDLPFC. Body mass index (BMI, in Kg/m<sup>2</sup>), body weight (BW, in kg) and height (m) were assessed at baseline (t0). Weight loss was verified weekly with measures at visits 5 (t5), 10 (t10), 15 (t15), 20 (t20), and at the last visit of the study (tF). Blood samples were collected at t0 and tF for 2-h oral glucose tolerance test (OGTT), for standard meal tolerance test (MTT), and for HbA1c determination. Changes in BMI, BW and area under the curve (AUCs) for glucose and insulin were analyzed with generalized estimating equations (GEE) and Bonferroni post-hoc testing; This protocol was registered at Clinical Trials.ORG (NCT 02683902), approved at UFRGS IRB. Consent term was applied in all subjects. Results: 10 subjects completed the study on this interim safety analysis (female 60%, obese 70%, mean age 38.1±4.6 years, BMI 30.9±2.4 kg/m<sup>2</sup>, IGM 20%, T2D 10%). Reduction of BW was not significant between groups at the end of the study. However, reduction in BMI was greater in the Active than in the Sham group (p=0.002). Changes over the time in BMI were -1.0±0.2 kg/m<sup>2</sup> in the Active group and -0.6±0.2 kg/m<sup>2</sup> in the Sham group (p<0.001). Although there was a greater reduction in the AUC for glucose (p=0.070) and insulin (p=0.083) from t0 to tF in the Active vs Sham group during the MTT, these changes did not reach statistical differences. Conclusion: This preliminary analysis suggests that repetitive active a-tDCS may be a potential non-invasive and adjunctive treatment in addition to life style modification for obesity management. keywords: electric brain stimulation, obesity, diet