

# A Randomized Double-Blind Clinical Trial on the Efficacy of Transcranial Direct Current Stimulation in Reducing Alcohol Consumption in Non-Abstinent Patients with Alcohol Use Disorder

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## Abstract:

**Background** Recent studies suggest that tDCS targeting the dorsolateral prefrontal cortex (DLPFC) result in significant reduction in craving for alcohol. To study the impact of tDCS on alcohol use outcomes, we designed a randomized double-blind trial of active tDCS targeting DLPFC versus sham tDCS in alcohol use disorder (AUD).

**Methods:** This study was supported by the CHU de Dijon Bourgogne and by a grant from the French Ministry of Health (PHRC 2014). Individuals with current AUD willing to reduce their consumption were randomized to receive active or sham anodal tDCS of the right DLPFC. As recommended, we chose as primary outcomes the total alcohol consumption (TAC) and the number of heavy drinking days (HDD) changes at 6-months follow-up. Participants received the assigned intervention (active or sham tDCS) during five consecutive days with two stimulation sessions per day. The group effects were estimated using 3 mixed models (including one multiple imputation model) for each primary outcome, with an alpha risk at 1.25% (unilateral).

**Results** Of 338 randomized participants, 253 participants provided at least partial data on daily self-report alcohol consumption and 127 provided complete data. All models showed improved outcomes favoring active tDCS group either on TAC or HDD, and two models reached statistical significance (concerning HDD). In active tDCS group there were an estimated 5.2 [ / ; 5.5] to 6.8 g [ / ; 1.4] TAC reduction and 0.8 [ / ; 1.9] to 2.2 [ / ; -0,1] HDD reduction.

**Conclusions** Our findings support the promising potential of tDCS for AUD. Although high rates of attrition precluded the confirmatory nature of our trial, imputation models showed a significant albeit limited effect of only 5 days of active tDCS on clinical AUD outcomes.

**Liens d'intérêt:** Les auteurs de cette communication certifient que ce travail n'a aucun lien avec l'industrie pharmaceutique, du tabac, de l'alcool, de la cigarette électronique et avec les compagnies de jeux.