Abstract

Background: Eating disorders are psychiatric illnesses whose treatment is difficult and usually the classic procedures fail. Recently, the number of researches in neuromodulatory methods has increased. I present an overview of basic stimulation methods, their use in the treatment of anorexia nervosa (AN), bulimia nervosa and binge-eating and the results of our study focused on the treatment of AN by transcranial direct current stimulation (tDCS).

Methods: It was a randomized, double-blind, sham-controlled trial. Forty-three inpatients with AN were divided to receive either active (n=22) or sham (n=21) tDCS over the left DLPFC (anode F3/cathode Fp2, 2mA for 30 minutes). All patients filled the Eating Disorder Examination Questionnaire (EDE-Q) and Zung depression scale (ZUNG), we measured them the thermal pain threshold, the objective dissatisfaction with their own body by Anamorfic program and evaluated BMI before the first and after the last tDCS. Follow-up was after 2 and 4 weeks. It was evaluated using ANOVA and OPLS model.

Results: Compared to sham tDCS, active tDCS improved self-evaluation based on one's body shape ($p < 0,05$) and significantly decreased the need of excessive control over calorie intake ($p < 0,05$) in 4-week follow-up (questions 4 and 23 in EDE-Q). Question 21 in EDE-Q was more improved in the sham group ($p < 0,05$) after tDCS. In the sham group, also mood symptoms improved significantly. There was a decrease in total ZUNG score as well as in the single questions (5, 11, 12 and 20) after the last session ($p < 0,01$) and in 4-week follow-up in questions 10 ($p < 0,01$) and 16 ($p < 0,05$). In both sham and active groups, the BMI values improved, albeit not significantly. There were no significant between-group differences in the Anamorfic program neither in the thermal pain threshold.

Conclusion: In comparison with other neuromodulation techniques, electroconvulsive therapy and deep brain stimulation seem to be the most effective in the treatment of eating disorders with other psychiatric comorbidities. Our findings in the follow-up indicate that active tDCS positively influences one's figure perception impact on self-evaluation and decreases the need to follow special eating rules. These factors are very important for the long-term outcome of eating disorders.

Key words: anorexia, binge-eating, bulimia, electroconvulsive therapy, deep brain stimulation, neuromodulation, repetitive transcranial magnetic stimulation, stimulation methods, transcranial direct current stimulation