



Received: 02-12-2024  
Accepted: 12-12-2024

## International Journal of Advanced Multidisciplinary Research and Studies

ISSN: 2583-049X

Letter to the Editor

### Before tDCS is Recommended as a Therapy for Binge Eating, its Positive Effect must be Confirmed by Appropriately Designed Studies

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DOI: <https://doi.org/10.62225/2583049X.2024.4.6.3581>

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We read with interest the article by Elkfury *et al.* on a double-blind, factorial, parallel, randomized, sham-controlled pilot study on the therapeutic effect of nutritional counselling therapy (NCT) and transcranial direct current stimulation (tDCS) in 40 women with binge eating disorder (BED) who were assigned to four treatment types: tDCS alone (group-1), NCT alone (group-2), sham tDCS plus NCT (group-3), tDCS plus NCT (group-4) <sup>[1]</sup>. Therapeutic effect was assessed using the binge eating scale as the primary outcome parameter and weight, the food craving questionnaire (FCQ), the three-factor eating behaviour questionnaire (TFEQ-21), accuracy of false alarms (ACCFA) and transcranial magnetic stimulation (TMS) as secondary outcome parameters <sup>[1]</sup>. A positive effect on the primary outcome was found in all four groups and a positive effect on the secondary outcome TMS in group-1 <sup>[1]</sup>. The conclusion was that the combined therapy (NCT plus tDCS) had no synergistic effect on BED <sup>[1]</sup>. The study is convincing, but some points should be discussed.

The first point is that the 40 women included were not clinically neurologically examined, including taste and smell testing, neuroimaging, EEG, endocrine testing, metabolic testing and possibly cerebrospinal fluid (CSF) testing. Before categorizing binge eating exclusively as a psychiatric disorder, it is essential to rule out any organic disease that either caused binge eating or contributed to its etiology.

The second point is that the women included were not screened for risk factors for binge eating. These include substance abuse, the presence of certain polymorphisms (DRD2, OPRM1, 5-HTT, MC4R), an altered gut microbiome, and impaired cortical connectivity <sup>[2]</sup>. The presence of certain risk factors can define subtypes of binge eaters that may require differentiated therapies rather than the same therapy for all. Determining whether any of these risk factors are present is also critical to the choice of treatment and the outcome of the disease.

The third point is that binge eating is often associated with comorbidities such as arterial hypertension, hyperlipidemia, diabetes mellitus, gastroesophageal reflux disease (GERD), hepatobiliary disease, coronary artery disease, obstructive sleep apnoea syndrome (OSAS), and hypothyroidism <sup>[2]</sup>. It is therefore essential to screen binge eaters for these comorbidities, not only to determine whether these comorbidities also require treatment, but also to determine whether any of these comorbidities are a contraindication to tDCS.

The fourth point is that only a limited number of patients completed the study <sup>[1]</sup>. Six in group-1, nine in group-2, nine in group-3 and four in group-4 <sup>[1]</sup>. Given this small number, the comparison between the groups remains questionable and the significance of the results is low.

The fifth point is that it is difficult to control whether the patients in group-1, group-3 and group-4 actually used tDCS or sham tDCS. As long as tDCS is performed by the patients themselves, a possible therapeutic effect may remain unreliable. The use of tDCS must be reliably controlled before conclusions can be drawn about its effectiveness.

The sixth point is that binge eaters may develop cognitive impairment over time <sup>[3]</sup>, so it would be necessary to check whether all women were really able to perform the task and carry out the stimulations correctly. Since binge eating can be associated with chemosensory dysfunction <sup>[4]</sup>, it would have been necessary to compare individuals with and without chemosensory dysfunction.

Overall, this interesting study has significant limitations that put the results and their interpretation into perspective. Addressing these limitations could strengthen the conclusions and support the message of the study. Before tDCS is recommended as a supportive therapy for BED, its positive effect must be confirmed by appropriately designed studies on large homogeneous groups of binge eaters.

**Keywords:** tDCS, ACCFA, Food Craving Questionnaire (FCQ)

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