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New home-administered treatment for binge eating disorder shows promising results

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Researchers from the Institute of Psychiatry, Psychology & Neuroscience (IoPPN) at King's College London have investigated the feasibility of a new home-administered treatment for binge eating

disorder. The new treatment combines a gentle brain stimulation technique called transcranial direct current stimulation (tDCS) with a training program that targets unhelpful patterns of attention around food.

The findings, published in *BJPsychOpen*, indicate that this might be a welcome new avenue for treatment.

Binge eating disorder (BED) is a serious mental illness that can affect anyone of any age, gender, ethnicity or background. People with the disorder have recurring episodes of losing control over their food intake, consuming lots of food in a short period of time until they are uncomfortably full. BED is typically accompanied by anxiety and low mood and linked to obesity and metabolic complications.

New approaches to meet an unmet need

Psychological therapies are recommended for treatment of BED and about 50% of those who receive treatment achieve a full and lasting recovery.

Research has shown that self-regulatory processes in the brain are instrumental in maintaining the cycle of binge eating and innovative approaches such as tDCS and attention bias modification training (ABMT) aim to target these processes.

TDCS changes function in the prefrontal areas of the brain by applying a gentle electrical stimulation to carefully selected areas of the brain via electrodes placed on the scalp. ABMT improves self-regulatory control by correcting unhelpful biases towards food cues and training people with BED to change how they attend to high-calorie food cues.

TANDEM trial

New tDCS devices have been developed to enable self-administration at home. The TANDEM trial investigated whether the simultaneous delivery of at-home self-administered tDCS with ABMT is feasible, acceptable and potentially effective for the treatment of BED.

Researchers recruited 82 participants who were overweight or living with obesity and who met the criteria for BED diagnosis. Participants were allocated to one of four groups that received either:

- 10 sessions of at-home self-administered tDCS during ABMT
- 10 sessions of pretend (sham) tDCS with a headset that did not deliver electrical stimulation during ABMT,
- 10 sessions of ABMT only,
- No treatment (they remained on a waitlist for 8 weeks).

Less binge eating; weight loss and mood improvements

Changes to binge eating behavior were most pronounced in those who received real tDCS with ABMT. In this group, binge episodes were reduced from around 20 times a month on average at baseline to six times a month at follow-up six weeks later.

Participants in the real tDCS with ABMT group also reported that they lost approximately 3.5 to 4 kg between baseline and six-week follow-up (reduction in mean body mass index [BMI] of 1.28 points). In comparison, over the same period of time, those who received ABMT with sham tDCS reported that they lost about 1.5 to 2 kg on average (reduction in mean BMI of 0.52 points) and those who received ABMT only reported negligible change in their weight (reduction in mean BMI of 0.07 points). There was no change in eating behavior or weight loss in

the no-treatment control group.

The group who received real tDCS with ABMT also reported substantial improvement in their mood between baseline and follow-up. No similar change in mood was reported in those who received sham tDCS with ABMT or in those who received ABMT only, and there was no change in mood in the no-treatment control.

Dr. Michaela Flynn, Research Associate at King's IoPPN, and first author on the study, said, "Current treatments for binge eating disorder are only effective for some people, and many need further or different support to get well. Our study is the first to look at a new option for home-based treatment that offers a different approach to treating binge eating disorder. TDCS targets the brain-driven patterns of behavior that might be contributing to the loss of control around food, enabling people to shift entrenched thinking and behavior around food.

"Participants commented that their mood felt lighter, which may be a key part of why they reported changes in eating behavior and weight loss that lasted for some time after treatment ended. Our findings are encouraging, and we want to explore this on a larger scale with more participants."

Professor Ulrike Schmidt OBE, Professor of Eating Disorders at King's IoPPN, and co-author, said, "Binge eating disorder is a really neglected but common and distressing eating disorder that is typically surrounded by a lot of shame. The treatment we tested is home-delivered, which allows it to reach people who may find it difficult to come into the community. For some time, eating disorder services have not been funded to work with or treat people with binge eating disorder. Importantly, the treatment described here is straightforward to deliver, making it potentially highly scalable in the NHS."

Professor Iain Campbell, Senior Research Fellow at King's IoPPN, said, "These encouraging clinical findings will help refine treatment protocols and promote studies of brain processes associated with neuromodulation. Future studies should verify these preliminary findings in a larger clinical trial which includes longer term follow-up beyond six-weeks.

"Additionally, the use of functional imaging and wearable technologies (which may provide insight into day-to-day changes in physical activity, food consumption, mood, and so on) might yield greater insight into the mechanism driving the therapeutic effects. Studies pairing tDCS with other treatments should also be considered, such as mindfulness or other cognitive training techniques. "

More information: A feasibility randomised sham-controlled trial of concurrent self-administered transcranial direct current stimulation (tDCS) and attention bias modification training in binge eating disorder, *BJPsych Open* (2024). DOI: 10.1192/bjo.2024.54

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