

Press release: European College of Neuropsychopharmacology (ECNP) congress, Copenhagen

Deep magnet stimulation shown to improve symptoms of obsessive compulsive disorder

Embargo Until: 00.05 (CEST, Copenhagen) Sunday 8th September 2019

Type of study: Peer reviewed/randomised controlled trial (RCT)/in people

- ***All in trial had previously failed SSRI treatment***
- ***38% of those patients responded to this treatment***
- ***OCD patients deliberately provoked before treatment to ensure maximum response***

Researchers have found that focusing powerful non-invasive magnet stimulation on a specific brain area can improve the symptoms of Obsessive Compulsive Disorder (OCD). This opens the way to treat the large minority of sufferers who do not respond to conventional treatment. The work is presented at the ECNP Conference in Copenhagen*.

OCD is broadly defined as recurrent thoughts or urges, or excessive repetitive behaviours which an individual feels driven to perform. Around 12 adults in every thousand suffer from OCD in any given year, although 2.3% of adults will suffer at some point in their life. It is generally treated through exposure and response prevention (ERP) therapy (which exposes the patient to the content of his obsessions\urges without performing the compulsions) and medication, such as SSRIs (Selective Serotonin Reuptake Inhibitors e.g. fluoxetine (Prozac/Sarafem) or Sertraline (Paxil) or Serotonin Reuptake Inhibitors e.g. clomipramine (Anafranil), however between a third and a half of patients don't respond well to treatment

Deep Transcranial Magnetic Stimulation (dTMS) is a type of brain stimulation technique where pulsed magnetic fields are generated by a coil placed on the scalp. This field activates the neuronal circuits at the target brain area, resulting in symptom improvement. It is clinically used for treatment of some difficult cases of depression.

Dr Lior Carmi (along with Prof. Joseph Zohar and Prof. Abraham Zangen), from the Chaim Sheba Medical Center in Israel, led an international group of scientists in a multi-centre randomised controlled trial (RCT) spread over 11 centres. 99 patients with Obsessive Compulsive Disorder were assigned to either be treated with dTMS, or to receive pretend treatment (sham treatment). All the patients in the trial had previously failed to respond to antidepressant treatment.

Dr Carmi said "An interesting point about this trial is that we deliberately provoked the patients for about 5 minutes before each dTMS session. We did this by tailoring a provocation for each patient according to their own specific OCD obsessions. For example, if someone had obsessions about getting contaminated, we exposed him to a situation in which these obsessions were aroused, for instance, touching a bathroom's door handle or the trash can. Another example would be if someone had obsessions regarding not closing

the water tap at home, we deliberately aroused the doubt about that. All these exposures were designed for each individual patient. During the first meeting with the patient we learned his symptoms and created a list of which exposures to use during the study. The idea is to deliver the treatment when the brain circuitry is aroused and not while the patient is thinking about the shopping he needs to do after the session will be over”.

The sessions consisted of 6 weeks of daily dTMS (20Hz) treatment focused on specific areas of the brain related to OCD**. This is the first time these areas have been targeted for this disorder. The degree of response was measured using the generally-accepted Yale-Brown Obsessive Compulsive Scale (YBOCS) questionnaire. After 6 weeks, 38% of those being treated responded to the treatment. They showed an average reduction of more than 30% in symptom severity, as opposed to 11% of patients receiving the sham treatment.

A month after treatment finished the response rate was 45.2% in the active group versus 17.8% in the sham group. Around a third of both the treated group and the untreated group complained of headaches, but only 2 dropped out over the trial due to pain.

Lior Carmi said, *“Researchers have tested TMS for OCD in the past, but this is the first time we have stimulated this region of the brain and done so while we tailored exposures to each patient. In addition, we have done so using a standardised protocol in a multi-centre randomised trial (at 11 sites in U.S, Canada and Israel). This means that we have achieved these positive results although the variety of patients and variety of clinicians who rated the response. Where the existing treatment works for OCD, it can work well; our method is primarily aimed at those who do not respond to conventional treatment”.*

Commenting, Professor Jose M Menchon (Bellvitge University Hospital, University of Barcelona, Barcelona, Spain) said:

“This is a very exciting study because it shows positive results in OCD using deep transcranial magnetic stimulation. Until now, the clinical trials with TMS in OCD had been carried out with non-deep TMS, which may have limitations in its effect because the magnetic field can only reach the cortical surface. However, deep TMS allows reaching and modulating deeper brain regions that can be more critically involved in OCD. Deep TMS may become a useful therapeutic strategy if these positive results are confirmed in further studies”.

Professor Menechon was not involved in this work, this is an independent comment.

Notes

*Recent publication: Carmi, L., Tendler, A., Bystritsky, A., Hollander, E., Blumberger, D. M., Daskalakis, J. & Feifel, D. (2019). Efficacy and Safety of Deep Transcranial Magnetic Stimulation for Obsessive-Compulsive Disorder: A Prospective Multicenter Randomized Double-Blind Placebo-Controlled Trial. *American Journal of Psychiatry*, appi-ajp.

**The Anterior Cingulate Cortex (ACC) and the Medial Pre-Frontal Cortex (mPFC).

All exposures were designed and approved by an expert clinician. The study was approved by ethics committees and Institutional Review Boards.

The study was funded by Brainsway Ltd.

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Notes for Editors

European College of Neuropsychopharmacology (ECNP) The ECNP is an independent scientific association dedicated to the science and treatment of disorders of the brain. It is the largest non-institutional supporter of applied and translational neuroscience research and education in Europe. Website: www.ecnp.eu

The 31st annual ECNP Congress takes place from 7th to 10th September in Copenhagen. It is Europe's premier scientific meeting for disease-oriented brain research, annually attracting up to 6,000 neuroscientists, psychiatrists, neurologists and psychologists from around the world. Congress website:

<https://2019.ecnp.eu/>

Conference Abstract

Efficacy and safety of deep transcranial magnetic stimulation for obsessive-compulsive disorder: a prospective multicenter randomized double-blind placebo-controlled trial

Objective:

Obsessive-compulsive disorder (OCD) is a chronic and disabling condition that often responds unsatisfactorily to pharmacological and psychological treatments. Converging evidence suggests a dysfunction of the cortical-striatal-thalamic-cortical circuit in OCD, and a previous feasibility study indicated beneficial effects of deep transcranial magnetic stimulation (dTMS) targeting the medial prefrontal cortex and the anterior cingulate cortex. The authors examined the therapeutic effect of dTMS in a multicenter double-blind sham-controlled study.

Methods:

At 11 centers, 99 OCD patients were randomly allocated to treatment with either high-frequency (20 Hz) or sham dTMS and received daily treatments following individualized symptom provocation, for 6 weeks. Clinical response to treatment was determined using the Yale-Brown Obsessive Compulsive Scale (YBOCS), and the primary efficacy endpoint was the change in score from baseline to posttreatment assessment. Additional measures were response rates (defined as a reduction of $\geq 30\%$ in YBOCS score) at the posttreatment assessment and after another month of follow-up.

Results:

Eighty-nine percent of the active treatment group and 96% of the sham treatment group completed the study. The reduction in YBOCS score among patients who received active dTMS treatment was significantly greater than among patients who received sham treatment (reductions of 6.0 points and 3.3 points, respectively), with response rates of 38.1% and 11.1%, respectively. At the 1-month follow-up, the response rates were 45.2% in the active treatment group and 17.8% in the sham treatment group. Significant differences between the groups were maintained at follow-up.

Conclusions:

High-frequency dTMS over the medial prefrontal cortex and anterior cingulate cortex significantly improved OCD symptoms and may be considered as a potential intervention for patients who do not respond adequately to pharmacological and psychological interventions.

