Deep TMS for Treatment-Resistant OCD: Does the Benefit Last?

Written by The Life Science Feed Editorial Team · Edited by Mara Voss

Obsessive-compulsive disorder (OCD) remains a debilitating condition for many, with a significant proportion of patients failing to achieve adequate response to conventional pharmacotherapy and psychotherapy. For these individuals, often termed 'treatment-resistant,' the search for effective and durable interventions is paramount. Deep transcranial magnetic stimulation (dTMS) has emerged as a non-invasive neuromodulation technique, but its sustained efficacy is a key concern for clinicians considering this approach.

KEY TAKEAWAYS

- The Pivot: Deep TMS provides a non-pharmacological option for patients with treatment-resistant OCD who have exhausted other avenues.
- The Data: While initial response rates are observed, the long-term maintenance of these benefits requires ongoing assessment and potentially booster sessions.
- The Action: Clinicians should consider dTMS for appropriate patients, but manage expectations regarding durability and plan for potential follow-up treatments.

Obsessive-compulsive disorder is characterised by intrusive thoughts, images, or urges (obsessions) and repetitive mental or behavioural acts (compulsions) that individuals feel driven to perform. These symptoms are time-consuming and cause clinically significant distress or impairment in social, occupational, or other important areas of functioning. Standard treatments include selective serotonin reuptake inhibitors (SSRIs) and cognitive behavioural therapy (CBT), particularly exposure and response prevention (ERP). But a substantial subset of patients, estimated to be between 40% and 60%, do not achieve full remission or even adequate symptom reduction with these first-line approaches. This unmet need has driven interest in alternative therapies, including neuromodulation techniques.

Deep transcranial magnetic stimulation (dTMS) is one such technique, distinguished from conventional TMS by its use of H-coils that allow for deeper and broader stimulation of brain regions. For OCD, the primary target for dTMS is often the medial prefrontal cortex and anterior cingulate cortex, areas implicated in the pathophysiology of the disorder. The procedure involves placing an electromagnetic coil on the patient's scalp, which generates brief magnetic pulses that penetrate the skull and induce electrical currents in targeted brain tissue. This modulates neuronal activity, aiming to rebalance dysfunctional circuits associated with OCD symptoms. Patients typically undergo daily sessions over several weeks, with each session lasting approximately 20 minutes.

Understanding the Initial Response to Deep TMS

Initial studies investigating dTMS for treatment-resistant OCD have generally focused on acute response rates following a defined course of treatment. These trials typically enrol patients who have failed multiple adequate trials of medication and psychotherapy, establishing a high bar for efficacy. The primary outcome measures often involve reductions in scores on the Yale-Brown Obsessive Compulsive Scale (Y-BOCS), a clinician-rated scale assessing symptom severity. A reduction of 30% or more from baseline Y-BOCS score is commonly used to define a clinical response, while a 35% or more reduction is often considered remission.

Patients undergoing dTMS for OCD often report improvements in both the frequency and intensity of their obsessions and compulsions. The mechanism is thought to involve the normalisation of hyperactivity in cortico-striato-thalamo-cortical (CSTC) circuits, which are believed to be overactive in OCD. By modulating these circuits, dTMS aims to reduce the pathological drive associated with compulsive behaviours and intrusive thoughts. The acute phase of treatment typically involves daily sessions for 4 to 6 weeks, after which response is assessed. The immediate effects can be encouraging for patients who have struggled for years with refractory symptoms.

The Critical Question of Durability

The real challenge with any intervention for chronic conditions like OCD is not just achieving an initial response, but sustaining it over time. Durability of response is particularly important for dTMS, given the time commitment and cost associated with the treatment. The question of how long the therapeutic benefits last, and what strategies might be employed to maintain them, is central to its clinical utility. Without sustained benefit, dTMS risks becoming another transient relief in a long history of failed treatments for these patients. This is a common challenge in neuromodulation, as seen in discussions around home-based stimulation for bipolar depression, where efficacy can be mixed.

Longitudinal follow-up studies are essential to address the durability question. These studies typically track patients for several months or even a year after completing the initial dTMS course. The primary endpoints in these follow-up periods often include the maintenance of the initial Y-BOCS response, the need for additional interventions, or the occurrence of relapse. Relapse is generally defined as a return to baseline symptom severity or a significant worsening that necessitates further treatment. The data collected from these extended observations help to paint a more complete picture of dTMS's real-world effectiveness.

Strategies for Maintaining Response

Maintaining the therapeutic gains achieved with dTMS is a complex issue, and several strategies are being explored. One approach involves the use of 'booster' sessions, where patients who show signs of waning response or early relapse receive additional dTMS treatments. These booster sessions are typically less frequent than the initial acute phase, perhaps weekly or bi-weekly for a shorter duration. The rationale is that periodic re-stimulation can help to reinforce the neural changes induced during the initial treatment, preventing a full return of symptoms. This concept is not unique to dTMS, as similar maintenance strategies are employed in other neuromodulation fields, such as nerve stimulation for pediatric bladder control.

Another strategy focuses on integrating dTMS with ongoing psychotherapy, particularly ERP. Even after dTMS-induced symptom reduction, patients may benefit from continuing to engage in behavioural therapy to solidify new coping mechanisms and prevent relapse. The idea is that dTMS might create a 'window of opportunity' by reducing symptom severity, making patients more receptive and able to engage effectively with psychotherapy. This combined approach

could potentially lead to more robust and durable outcomes than either modality alone. For clinicians seeking a comprehensive overview of psychiatric treatments, the Oxford Handbook of Psychiatry offers a valuable resource.

Adverse Events and Patient Selection

The safety profile of dTMS is generally considered favourable, with the most common adverse events being mild to moderate headache and transient scalp discomfort at the stimulation site. These side effects typically resolve shortly after the session or with over-the-counter analgesics. Serious adverse events, such as seizures, are rare but remain a concern, particularly in patients with predisposing factors. Careful patient selection is essential for patient safety, involving a thorough medical history and neurological examination to identify any contraindications. Patients with a history of epilepsy, metallic implants in the head (excluding dental fillings), or pacemakers are generally excluded from dTMS treatment.

The open-label nature of many follow-up studies is an obvious caveat. Without a sham control group during the maintenance phase, it is difficult to fully disentangle the specific effects of booster sessions from other factors, such as continued engagement with therapy or natural fluctuations in symptom severity. This limitation is inherent in long-term studies of neuromodulation, where blinding can be challenging to maintain over extended periods. Still, the observed patterns of sustained response or the need for booster sessions provide valuable real-world insights into the practical application of dTMS.

The long-term efficacy of dTMS for treatment-resistant OCD is an area of ongoing research. While initial responses are promising because they show significant symptom reduction for a difficult-to-treat population, the durability of these benefits requires careful consideration. Strategies like booster sessions and integration with psychotherapy are being explored to extend the therapeutic window. The field continues to refine treatment protocols and identify patient characteristics that predict a more sustained response, aiming to provide lasting relief for those burdened by severe OCD. The question of optimal maintenance schedules and patient selection criteria remains to be fully elucidated.

> **CLINICAL IMPLICATIONS**
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> For patients with truly treatment-resistant OCD, dTMS represents a viable option when conventional pharmacotherapy and psychotherapy have failed. It offers a non-pharmacological pathway that can provide meaningful symptom reduction, which is a significant development for a population often left with limited choices. Clinicians should be prepared to discuss the commitment involved, both in terms of initial treatment intensity and the potential for maintenance sessions.
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> The data on durability, while still evolving, suggests that an initial course of dTMS may not be a one-and-done solution for many. GPs and specialists referring patients should set realistic expectations regarding the need for potential booster sessions or ongoing adjunctive therapies to maintain gains. This necessitates a long-term management plan, rather than viewing dTMS as a singular, definitive intervention.
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> From an industry perspective, the focus will likely shift towards optimising maintenance protocols and identifying biomarkers that predict long-term responders. This could lead to more personalised treatment approaches, reducing the burden on patients and healthcare systems. The economic implications of sustained response versus repeated acute treatments will also be a critical factor in broader adoption and reimbursement.

> The role of dTMS in the OCD treatment algorithm is solidifying as an important tool for refractory cases. But its true value will be measured not just by initial symptom reduction, but by its capacity to provide lasting relief, allowing patients to reclaim their lives from the relentless grip of obsessions and compulsions.

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