

# AN INTEGRATIVE TREATMENT MODEL WITH DEEP TRANSCRANIAL MAGNETIC STIMULATION WITH PROVOCATIVE THERAPY IN OBSESSIVE COMPULSIVE DISORDER AFTER TRAUMATIC LIFE EXPERIENCES

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## INTRODUCTION

A severe mental illness known as obsessive-compulsive disorder (OCD) is characterized by varying degrees of obsessive thoughts and/or compulsive behaviors. Although exposure-response prevention (ERP)-based cognitive behavioral therapy (CBT) alone or in combination with selective serotonin reuptake inhibitors (SSRIs) is still the preferred initial treatment approach, many patients (40–60%) do not respond clinically to an SSRI (Hirschtritt et al. 2017).

Deep transcranial magnetic stimulation (dTMS) with the H7-coil directly targets the anterior cingulate cortex, a part of a cortico-striato-thalamo-cortical (CSTC) circuit that is dysfunctional in OCD patients. The H7 dTMS coil target deeply and broadly to the medial prefrontal cortex (mPFC) and anterior cingulate cortex (ACC) (Roth & Zangen 2014). Using Faraday's law of electromagnetic induction, dTMS uses brief magnetic pulses to induce targeted neuronal depolarization in the brain (George and Belmaker, 2007). Here, we present a case with persistent substance abuse as self-medication, OCD, and recurring traumatic experiences recovered successfully with an integrative model of provocative dTMS therapy that aims to gain insight about treatment resistant OCD.

## CASE

A 24-year-old female, university student; her parents are healthy, has a one sister, who is leaving alone, brought to emergency service by her parents with possible suicidal thoughts when her parents could not reach her in the home during COVID-19 pandemic as she fell into sleep. "I can't live in my house because I'll touch something," she explained. She spent a substantial amount of her day (about 6 hours) washing her hands, making sure that there was nowhere the water didn't touch. She did a ritualistic four-time hand washing, followed by a thumbs-up. She feared imagining her father as naked and subsequently wondering if she touched his body. To keep from touching anything her father has previously touched, she has been restrained to her home. She had insight about her disease.

Her psychiatric examination showed intense depressive affect, and there was no weakness in thought processes, but the current of thought was irregular. There were not any psychotic symptoms. Tendency to have difficulty in impulse control and distrust of the outside world were noted. Poor capacity to cope with feelings of grief and loss. Her ability to assess reality was mostly retained. Laboratory findings were in normal range. As a method of self-medication, she misused ketamine, clonazepam, and

**Table-1** YBOCS

Contamination Obsessions:	1. Worrying or disgusting about body waste and secretions ('now and in the past' the patient is quite worried about her father's urine and feces and cleans it constantly.) 2. Worrying about dirt and germs ('now and in the past' the patient is worried that he will get germs from the toilet bowl, she cannot stand the toilet bowl)
Sexual Obsessions:	1. Regarding images or impulses of forbidden or perverse sexual thought ('now and in the past' I constantly think of my father naked; she says, I cannot prevent this thought)
Cleaning Wash Compulsions:	1. Excessive and Ceremonial hand washing: (says 'present and past' a ritual four-time cleaning of her hands and making a thumb sign afterward)
Control Compulsions:	1. Check if you made a mistake (I check 'past and now', checking whether she touched the body of her dad or surfaces her father has touched)
Overall Rating	<ul style="list-style-type: none"><li>• The patient has insight into their obsessions and compulsions.</li><li>• There is a deterioration in functionality.</li></ul>

alprazolam. At the time she was hospitalized, her Yale Brown Obsessive Compulsive Scale (YBOCS) score was 40 (Table 1). Scores of emotional, physical, and sexual abuses as well as scores of emotional and physical neglects were higher than cut-off values on the Childhood Trauma Questionnaire. Her cranial magnetic resonance imaging (MRI) did not show any pathology to the neural parenchyma. Topographic brain mapping revealed a normal electroencephalogram (EEG) with an increase in theta, alpha, and beta waves.

## THE PSYCHIATRIC HISTORY

Her melancholy and irritable mood symptoms first manifested at the beginning of high school when she was bullied and rejected by her peers. When she was 15 years old, she started cleaning all her clothes repeatedly after touching a dirty item or surface. Isolation and separation from her partner during her senior year of high school generated melancholy symptoms. She had self-mutative habits during adolescence. During university years, she was treated for depression and OCD after returning from abroad. Her treatment included 20 sessions of TMS with a 25 Hz-right PFC stimulation and cognitive-behavioral therapy and medication of clomipramine, which was occasionally combined with aripiprazole and had the side effects of sedation and weight gain. Sertraline and fluvoxamine were ineffective for her symptoms. Following a three year of remission period with no use of medication.

## DEVELOPING AN INTEGRATED TREATMENT APPROACH

As part of the integrative approach, three initial observations served as the foundation for planning and therapeutic decisions. OCD and borderline personality disorder co-occur. She was first directed to a drug abuse treatment program while in the hospital for addiction awareness. Second, recurrent traumatic experiences were dealt with by increasing awareness of the need to avoid placing herself in similar damaging situations repeatedly and by acting as though these events even didn't happen or would cause a shock reaction. Sexual trauma led to incestuous fear of her father and contamination obsession that was sparked by his presence. Third, psychoeducation about OCD symptoms was provided, with an emphasis on the functional interactions between symptom sets and the similarities and differences between OCD

and trauma-related symptoms to distinguish between her obsessions and the stuck points particular to her trauma-related symptoms. We created OCD exposure tasks after learning the fundamentals of exposure-response prevention (ERP) and using them also during provocation of dTMS. Furthermore, Cognitive Processing Therapy (CPT) techniques were used to directly challenge unhelpful stuck points without engaging in cognitive restructuring when engaging in ritual prevention-triggered trauma-related symptoms.

## DTMS PROTOCOL

Patients who have OCD are scheduled for a diagnostic evaluation with a psychiatrist, who reviews their medical history, records their current OCD symptoms, and records prior treatment attempts. She completed eight to nine therapist-assisted OCD exposures during dTMS and other continued as self-exposure. A total of 29 sessions dTMS –provocation was completed.

Pharmacological treatment was adjusted according to the blood levels of the drug. Fluvoxamine 2×100 mg, olanzapine 1x10 mg, trifluoperazine 2×1 mg and for palpitation, propranolol 2×20 mg were prescribed. Trauma-related self-protection was strengthened. Her YBOCS score during discharge was 7.

## DISCUSSION

OCD has been associated with the CSTC loop circuit, which flows from the brain to the striatum, thalamus (via the globus pallidus), and back to the cortex (Posner et al., 2014). We outlined the principles of exposure response prevention and created a list of obsessions that items kept in long-term memory are more likely to be altered by dTMS when they are retrieved after being provoked. When the targeted circuit is activated by this provocation dTMS technique, the effects of dTMS become more obvious because the targeted ACC-mediated aberrant information flow in the frontal-basal ganglia circuit of OCD is engaged. After inducing symptoms, it was discovered that some CSTC circuit components were overactive (Saxena & Rauch, 2000). Long-term memory eventually stabilizes after acquisition through a process known as consolidation which is susceptible to modification (e.g., by stimulation) upon retrieval (e.g., following provocation) and can help to explain these phenomena (Dudai, 2006). Cognitive restructuring focused on five areas to change “stuck points,” or maladaptive trauma-related cognitions: safety, trust,

power/control, esteem, and intimacy. Because comorbid disorders have the potential to complicate treatment, posttraumatic stress disorder (PTSD) and OCD patients reported OCD symptoms that appeared to be inextricably linked to their traumatic experiences. Trauma leaves strong emotions, and if they are not processed and the loss is not mourned, these charged emotions take on the characteristics of emotional volcanoes or timed bombs that are easily activated (Sutović, 2021). Increases in OCD symptoms are linked to PTSD symptoms, and vice versa. A similar disorder is referred to as posttraumatic OCD (Pitman, 1993). OCD has been observed to serve as a (maladaptive) coping method, minimizing interaction with trauma-related concepts/images (Gershuny et al. 2003, Van Kirk et al. 2018). Similar phenomena have been discussed in the context of other comorbidities, such as OCD and borderline personality disorder, in which a functional relationship between symptom sets leads to comorbid symptoms maintaining each other (Grayson, 2010).

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## CONCLUSION

This case study highlights the significance of identifying comorbid disorders because they have the potential to make treatment more difficult. Critical steps in the evaluation process include identifying diagnoses and performing a functional analysis of the relationships between the illnesses and making an integrative treatment plan will be crucial for retractable OCD patients.

**Ethical Considerations:** Does this study include human subjects? YES

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