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Case Study

Obsessive-Compulsive Disorder (OCD) Case Series: Neuropsychological Deficits and Psychotherapy Outcomes

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ABSTRACT

Background: Obsessive-Compulsive Disorder (OCD) is a chronic psychiatric disorder characterized by intrusive thoughts (obsessions) and repetitive behaviors (compulsions). Neuropsychological deficits, such as impaired executive functioning, cognitive rigidity, and emotional dysregulation, are frequently observed in individuals with OCD. Comorbid conditions, including Generalized Anxiety Disorder (GAD), Major Depressive Disorder (MDD), Trichotillomania, and Migraine, further complicate clinical presentation. This case series examines four patients diagnosed with OCD and comorbid conditions, focusing on their neuropsychological deficits and response to psychotherapy. **Methods:** Each case was assessed using standardized neuropsychological tools, including the Yale-Brown Obsessive-Compulsive Scale (Y-BOCS), Wisconsin Card Sorting Test (WCST), Stroop Test, Wechsler Adult Intelligence Scale (WAIS), and Depression Anxiety Stress Scales (DASS). Treatment plans incorporated a combination of Exposure and Response Prevention (ERP), Cognitive Behavioral Therapy (CBT), Mindfulness-Based Cognitive Therapy (MBCT), Habit Reversal Therapy (HRT), and Supportive Psychotherapy over an 8–12 month period. Symptom severity, cognitive flexibility, and emotional regulation were measured pre- and post-therapy. Graphical representations highlight therapy outcomes.

Keywords: *Obsessive-Compulsive Disorder, Neuropsychology, Cognitive Behavioral Therapy, Exposure and Response Prevention, Mindfulness-Based Cognitive Therapy, Habit Reversal Therapy, Comorbidity, Executive Functioning, Emotional Regulation, Biofeedback*

Obsessive-Compulsive Disorder (OCD) is a debilitating neuropsychiatric condition with a global prevalence of approximately 2–3% (Ruscio et al., 2010). It is characterized by persistent, distressing obsessions and compulsions aimed at reducing anxiety. OCD is linked to dysfunctions in the cortico-striato-thalamo-cortical (CSTC) circuitry, with neuroimaging studies indicating hyperactivity in the orbitofrontal cortex and basal ganglia (Menzies et al., 2008). Common comorbidities include Generalized Anxiety Disorder (GAD), Major Depressive Disorder (MDD), Trichotillomania, and chronic migraines, further complicating clinical management (Cisler et al., 2011).

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Gold-standard treatments for OCD include pharmacotherapy, primarily selective serotonin reuptake inhibitors (SSRIs), and psychotherapeutic approaches such as CBT and ERP (Koran et al., 2007). Emerging interventions, including MBCT and HRT, have shown promise in improving cognitive flexibility and symptom management (Hertenstein et al., 2022). This case series aims to explore neuropsychological deficits and therapeutic outcomes in patients with OCD and comorbid conditions.

METHODOLOGY

Four patients diagnosed with OCD and comorbid conditions were evaluated using standardized neuropsychological assessments. Treatment interventions varied based on individual symptom profiles and included ERP, CBT, MBCT, and HRT. Therapy sessions spanned 8–12 months, with pre- and post-treatment assessments used to measure improvements in symptom severity and cognitive flexibility.

Case Presentations

Case 1: OCD with Generalized Anxiety Disorder (GAD) A 32-year-old female presented with contamination obsessions and excessive handwashing, leading to severe skin damage. Comorbid GAD exacerbated her symptoms, manifesting in persistent worry and heightened physiological arousal. Pre-therapy assessments indicated high Y-BOCS scores (28/40) and cognitive rigidity on WCST. A structured therapy plan combining ERP and CBT was implemented over 12 months. The ERP component involved gradually exposing the patient to feared contaminants while preventing compulsive handwashing. CBT targeted maladaptive thoughts related to contamination, fostering cognitive restructuring. Post-therapy, Y-BOCS scores dropped to 12/40, and cognitive flexibility showed improvement, allowing the patient to function more effectively.

Case 2: OCD with Major Depressive Disorder (MDD) A 28-year-old male exhibited intrusive thoughts of harm and compulsive checking behaviors, significantly affecting daily life. He developed comorbid MDD, which worsened compulsions and led to social withdrawal. Neuropsychological tests showed executive dysfunction and poor impulse control. MBCT was integrated with CBT to address depressive symptoms and cognitive rigidity. MBCT emphasized mindfulness exercises, helping the patient detach from obsessive thoughts without engaging in compulsions. CBT techniques, including cognitive restructuring and exposure exercises, were implemented over 10 months. Post-treatment assessments revealed a reduction in depressive symptoms, and compulsions decreased from 50 to 15 daily occurrences, significantly improving quality of life.

Case 3: OCD with Trichotillomania and Stereotypical Thoughts A 22-year-old male presented with obsessive hair-pulling behaviors along with ritualistic counting. WCST results reflected severe cognitive inflexibility, and Stroop Test performance showed impaired inhibitory control. The therapeutic plan included a combination of ERP and Habit Reversal Therapy (HRT). ERP was used to gradually expose the patient to stressors that triggered compulsive behaviors, while HRT introduced competing responses to replace hair-pulling. Over 12 months, compulsions reduced from 60 to 20 per day, and cognitive flexibility improved marginally. The patient reported increased awareness of triggers and better control over behaviors.

Case 4: OCD with Migraine and Stereotypical Thoughts A 19-year-old male suffered from OCD with compulsive blinking and number-based rituals, along with chronic

migraines exacerbated by anxiety. Pre-therapy Y-BOCS scores were 30/40. The treatment plan incorporated ERP, supportive psychotherapy, and biofeedback training. ERP reduced compulsions, while supportive psychotherapy helped manage frustration related to chronic pain. Biofeedback techniques were introduced to regulate physiological responses to stress, decreasing migraine frequency. Over 10 months, symptom severity dropped significantly (Y-BOCS: 30 to 10), and neuropsychological assessments indicated improved inhibitory control and emotional regulation.

Tables

Table 1: Summary of Neuropsychological Assessments

Assessment Tool	Function Measured	Pre-Therapy Score (Average)	Post-Therapy Score (Average)
Y-BOCS	OCD Severity	30/40	12/40
WCST	Cognitive Flexibility	High Perseverative Errors	Reduced Perseverative Errors
Stroop Test	Inhibitory Control	Poor Performance	Improved Performance
WAIS	Executive Functioning	Below Average Scores	Near Normal Scores
DASS	Emotional Regulation	High Stress & Anxiety	Significant Reduction

Table 2: Therapy Outcomes in OCD Patients

Case	Comorbidity	Therapy Used	Y-BOCS Pre	Y-BOCS Post	Compulsions Pre	Compulsions Post
1	GAD	ERP, CBT	28	12	40	10
2	MDD	MBCT, CBT	32	14	50	15
3	Trichotillomania	ERP, HRT	34	20	60	20
4	Migraine	ERP, Supportive	30	10	45	10

DISCUSSION

Neuropsychological impairments in OCD, including deficits in response inhibition and cognitive flexibility, contribute to symptom persistence. Patients with OCD frequently struggle with set-shifting, working memory, and decision-making deficits, which exacerbate compulsive behaviors. Dysfunction in the CSTC circuitry plays a critical role in these deficits, making cognitive remediation a vital aspect of treatment (Chamberlain et al., 2005).

This case series highlights the efficacy of various therapeutic approaches. ERP emerged as the most effective intervention, particularly for patients with contamination fears and compulsive checking behaviors. By gradually exposing patients to anxiety-provoking stimuli and preventing their usual compulsive responses, ERP facilitated desensitization and cognitive restructuring. CBT proved particularly beneficial for patients with comorbid GAD and MDD, helping them challenge maladaptive beliefs and regulate emotions (Franklin et al., 2011). MBCT was effective in mitigating ruminative thought patterns, fostering

mindfulness skills that allowed patients to observe their intrusive thoughts without reacting to them impulsively.

HRT was instrumental in reducing trichotillomania-related compulsions. Patients undergoing HRT successfully replaced hair-pulling behaviors with competing responses, reinforcing self-awareness and impulse control. Additionally, biofeedback was valuable for patients with migraines, aiding in stress regulation and reducing physiological reactivity to anxiety triggers (Lochner et al., 2016).

Long-term treatment adherence remains a significant challenge. While many patients exhibit symptom reduction, relapse prevention strategies are crucial. Booster therapy sessions, digital therapeutics, and mobile cognitive training applications may enhance treatment adherence and sustainability. Future research should explore the integration of virtual reality exposure therapy and neurofeedback as potential adjunctive treatments for OCD.

CONCLUSION

This case series highlights the complex relationship between neuropsychological deficits and OCD symptoms, emphasizing the need for targeted therapeutic approaches. While ERP and CBT remain the cornerstone treatments, incorporating MBCT, HRT, and biofeedback enhances treatment effectiveness. The findings suggest that a comprehensive, multi-faceted approach can significantly improve cognitive flexibility, emotional regulation, and overall symptom reduction. However, maintaining these improvements requires long-term follow-up, booster sessions, and innovative interventions such as digital therapeutics. Future studies should explore advanced, technology-driven strategies to ensure sustained benefits and improved quality of life for individuals with OCD.

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Conflict of Interest

The author(s) declared no conflict of interest.

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