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Improvement in the Neurocognitive Functions of Patients with Obsessive-Compulsive Disorder Treated with Cognitive Behavioral Therapy: A Case Report

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ABSTRACT

Obsessive-compulsive disorder (OCD) is a psychiatric disorder characterized by obsessions and compulsions, in which neurocognitive features and deficits have been frequently investigated. Some studies have suggested that individuals with OCD have an increased risk of dementia. The efficacy of cognitive behavioral therapy (CBT) in the treatment of OCD has been demonstrated in numerous studies; however, the applicability and effectiveness of CBT in patients with cognitive impairments remain controversial. The present case involves a patient with a chronic course of OCD accompanied by depressive symptoms who presented with neurocognitive deficits at the onset of therapy. Throughout the treatment process, the session structure was adapted to the patient's cognitive profile, and the session frequency was adjusted in consideration of the primary disorder and neurocognitive limitations. In addition to exposure and response prevention, the treatment plan incorporated behavioral activation strategies and cognitive stimulation exercises. By the end of therapy, the patient exhibited marked improvement in obsessive-compulsive symptoms, depressive features, and cognitive functioning.

Keywords: Cognitive behavioral therapy, executive functions, neurocognitive deficit, neurocognitive improvement, obsessive-compulsive disorder, visuospatial functions.

ÖZ

Bilişsel Davranışçı Terapi Uygulanan Obsesif Kompulsif Bozukluk Olgusunda Nörobilişsel İşlevlerde İyileşme: Bir Olgu Sunumu

Obsesif kompulsif bozukluk; obsesyon ve kompulsiyonlar ile kendini gösteren, tanılı kişilerde nörobilişsel özellikler ve yetersizlikler sık araştırılan, bazı çalışmalarda demans riskinin arttığı bildirilen bir hastalıktır. Obsesif kompulsif bozukluğun tedavisinde bilişsel davranışçı terapinin etkinliği pek çok çalışmada gösterildi ancak bilişsel yetersizlikleri olan olgularda bilişsel davranışçı terapinin uygulanmasında zorluklar bulunduğu ve tedaviye katkısının tartışmalı olduğu bildirilmektedir. Olgumuz, terapinin başlangıç aşamasında nörobilişsel yetersizlikleri saptanmış, kronik seyirli obsesif kompulsif bozukluk tanısı olan, depresif belirtiler eşlik eden bir hastadır. Terapi süreci boyunca seans yapısı hastanın bilişsel özelliklerine uygun hale getirildi, seans sıklığı hem primer hastalık hem de nörobilişsel yetersizliği gözetilerek ayarlandı, eylem planı maruziyet ve yanıt önlemenin yanı sıra aktivasyon artışı ve nörobilişsel alıştırmalar da eklenerek yapıldı. Terapi süreci sonunda hastanın obsesif kompulsif bozukluk, depresyon ve bilişsel özelliklerinde belirgin iyileşme gözlendi.

Anahtar Kelimeler: Bilişsel davranışçı terapi, yönetici işlevler, nörobilişsel yetersizlik, nörobilişsel iyileşme, obsesif kompulsif bozukluk, vizuospasyal işlevler.

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INTRODUCTION

Obsessive-compulsive disorder (OCD) is a psychiatric disorder characterized by intrusive, repetitive thoughts, images, or impulses that cause significant distress and anxiety and are accompanied by repetitive, ritualized behaviors and mental acts. Its lifetime prevalence has been reported to be 2%–3% (American Psychiatric Association, 2013). It is associated with a significant loss of functionality and often shows a chronic course (Stein et al, 2019). Neurocognitive features and deficits in individuals diagnosed with OCD are among the most frequently researched topics, and there are studies reporting an increased risk of dementia in OCD (Chen et al, 2021; Dadkhah et al, 2022; Mrabet Khiari et al, 2011). In the treatment of OCD, cognitive behavioral theory is widely accepted in explaining the emergence and maintenance of the disorder, and the effectiveness of cognitive behavioral therapy (CBT) has been shown in many studies (National Institute for Health and Care Excellence, 2005; Olatunji et al, 2013). CBT has been reported to benefit general well-being and reduce disability in patients with neurocognitive deficits, but its direct effect on neurocognitive functions has not been fully established (Simon et al, 2015). It has also been reported that neurocognitive deficits detected in patients with OCD do not change the response to OCD CBT (Aydın & Öyeçkin, 2013; Simon et al, 2015). In this article, we aimed to discuss the treatment of OCD with CBT in a patient with impairment in neurocognitive areas, such as attention, orientation, visuospatial and executive functions, language, and memory, and the improvement in neurocognitive functions observed with recovery in the light of current literature.

CASE REPORT

A 60-year-old high school graduate married woman was living with her extended family. She was admitted to the psychiatry outpatient clinic with the accompaniment and recommendation of her family because she was obsessed with contamination and had a compulsion for cleanliness and orderliness for about 32 years. The patient's primary complaints included spending the majority of the day engaged in cleaning activities, controlling the behaviors of household members and their use of the bathroom, increased irritability, difficulties in attention and concentration, memory impairment, and reluctance to leave the house. She had been receiving regular psychiatric treatment, mainly pharmacotherapy, for the last 33 years for these long-standing complaints. Recently, sadness and decreased speech were added to these complaints. She stated that she had received short-term psychotherapy but could not clearly remember its contents. It was reported that she had been taking clomipramine 75–225 mg/day, venlafaxine 75–225 mg/day, citalopram 40 mg/day, sertraline 100–200 mg/day, and olanzapine 2.5–5 mg/day, and had not experienced sufficient benefit. She was still under treatment with escitalopram 15 mg/day, bupropion 150 mg/day, and aripiprazole 15 mg/day.

The patient's family history revealed obsessive-compulsive disorder in her mother and sister, as well as diagnoses within the spectrum of obsessive-compulsive and psychotic disorders in her daughter.

In the psychiatric examination, her clothing and self-care were appropriate for her sociocultural level, but she appeared older than her age and had limited eye contact. She spoke in a low and difficult-to-understand voice, spoke in short sentences, and sat in a forward-leaning posture with slumped shoulders. There were obsessions with slowing down the flow of thought and contamination in the thought content. She had a blunted affect and a markedly sad mood. A deficit in short-term memory was observed, as the patient was able to recall only one of the three presented items. Judgment and reality testing were found to be intact.

In the structured interview form for DSM-5 (SCID-5), the patient was diagnosed with depression and OCD that had been experienced 21 years ago. Although she had depressive symptoms for approximately five weeks, she was considered subthreshold for major depressive disorder. The Yale–Brown Obsessive-Compulsive Scale (Y-BOCS) total score was 31/40. The Beck Depression Scale was 25/63, and the Beck Anxiety Scale was 23/63. In the mini-mental test (MMT) for memory deficits, she scored 21 out of 30 points. There were inadequacies, especially in the orientation, attention, calculation, and recall sections. In the MMT, she answered three out of five questions in the orientation section, could remember only two out of three objects when given a clue in the recall section, and was able to remember the third object only when asked multiple choice questions. Visual repetition (drawing, repeating a drawing) skills were also inadequate. In the neuropsychiatric evaluation, a digit span test was applied for attention and attention maintenance skills; she was able to progress at the level of straight three inverted two; as a result of the verbal memory evaluation, she was able to save four of the ten verbal items in memory after the third repetition, and was able to retrieve two of these items spontaneously and three of them by recognizing them 10 min later. Inappropriate responses were detected in the Stroop test. In this state, it was reported as mild-to-moderate cognitive impairment and frontal-type memory impairment. In terms of personality traits, she was generally recessive and dependent but did not meet the criteria for any personality disorder. Biochemical tests were within normal limits, and brain magnetic resonance imaging findings were considered age-consistent changes.

The diagnostic evaluation revealed OCD, mild depressive symptoms, and frontal-type memory impairment. In the differential diagnosis of neurocognitive impairment, depressive symptoms were excluded from the etiology because they persisted for a short time. It was planned to determine during follow-up whether the condition was secondary to obsessive-compulsive disorder and polypharmacy or indicative of a primary dementia process, and the patient was initiated into psychotherapy.

Problem List

1. Significant distress associated with obsession with contamination
2. Cleaning, organizing, and sorting behaviors occupy a substantial portion of the day.
3. Avoidance of external environments and internal areas such as bathrooms and toilets due to fear of contamination
4. The expectation that other family members will comply with the patient's rituals, resulting in interpersonal dysfunction.
5. Memory impairment
6. Fatigue
7. Polypharmacy involving multiple psychiatric medications

Goal List

1. Reduction in cleaning and meticulous behavior, and improved time management
2. Ability to engage in pleasurable activities outside the home
3. Decreased fatigue and enhanced capacity for self-care and personal time
4. Improvement in interpersonal relationships with family members
5. Reduction in forgetfulness

Therapy Process

Three assessment sessions and one motivational interview were conducted, including psychiatric evaluations, scale administrations, clinical history-taking, and examination of relevant investigations. A total of 33 sessions of CBT for OCD were conducted. Sessions were initially scheduled twice weekly, the reduced to once weekly after the sixth session, and continued at that frequency until the 21st session. Following the 23rd session, the frequency was decreased to biweekly, and after the 24th session, the sessions continued with a gradual decrease in frequency. After the 28th session, follow-up sessions were initiated, and the therapy process was completed in approximately 2 years. Control sessions were held once every 2 months.

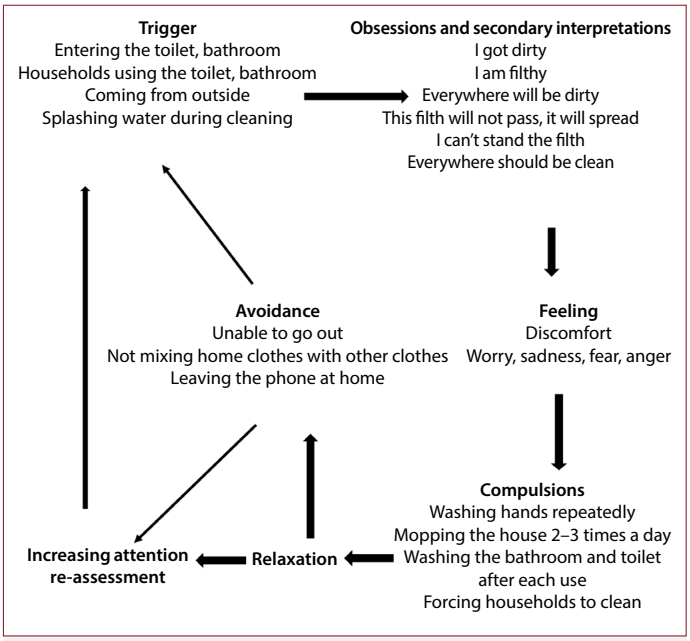

Figure 1. Case-specific cognitive behavioral formulation.

As the patient demonstrated insufficient knowledge and motivation regarding her illness, the initial sessions were devoted to motivational interviewing and psychoeducation. Due to cognitive impairment and depressive symptoms, clear, developmentally appropriate, and concrete language was used throughout the sessions, avoiding abstract expressions such as metaphors and idioms. In addition to the end-of-session summaries, brief mid-session recaps were provided. The formulation is presented in Figure 1. Socratic questioning, which is a core element of CBT, was emphasized in this case. It was observed that the patient recalled questions more effectively at the end of the session when she was able to provide short answers, when frequent feedback was given, and when the feedback was recorded in real time. This style was maintained throughout the therapy process. Since sessions lasting more than 40 min were associated with a decline in compliance, recall, and response generation, the sessions were structured to last between 30 and 35 min.

In-session exposure exercises were initiated after the fourth session, and distress-related cognitions were explored. The first exposure task involved touching a napkin that had touched the table. The patient reported an anticipated distress of 90 out of 100, with an actual rating of 85 at the beginning of the task and 40 after 30 min. Cognitive restructuring techniques

were employed to evaluate the validity of maladaptive beliefs related to distress. The patient developed the belief that distress could subside on its own without engaging in cleaning behaviors and that she could tolerate the discomfort associated with contamination. After this cognitive shift, home-based exposure exercises were initiated and structured hierarchically based on the list of distress-inducing situations provided by the patient.

Following the first motivational interview, cognitive exercises were recommended to address deficits in word recall, verbal usage, numerical sequencing, and processing speed—tasks that could be adapted to her daily life. Socialization and activities supporting the tracking of sequential events were also encouraged. In this context, exercises such as word and letter games, number sequences, dictation writing, reading, and summarizing tasks were prescribed. To target depressive symptoms and neurocognitive impairments, 30-min walks were added 3–5 times per week, with the instruction to choose a different route each day and to follow the same route on the return. However, interventions related to compulsive washing rituals performed after walking were deferred to later sessions.

At the end of the third month, a total of 18 sessions were completed. A 70% reduction in symptoms such as hopelessness and low energy was observed, along with a 40% reduction in the total daily washing time. The Yale–Brown Obsessive-Compulsive Scale (Y-BOCS) score decreased by 30%. During this phase, medication adjustments were initiated. After the 12th session, the aripiprazole dose was reduced. At the six-month follow-up, the regimen was adjusted to 15 mg/day of escitalopram and 5 mg/day of aripiprazole, and bupropion was discontinued. In the ninth month, aripiprazole was discontinued.

By the end of the first year, a total of 27 sessions had been conducted. After more than 80% reduction in symptoms, the escitalopram dosage was reduced to 10 mg. Given the patient's 33-year history of continuous antidepressant use, escitalopram was gradually tapered over approximately 1 year, with adjustments based on the patient's clinical status.

At the final psychiatric evaluation, the patient's appearance and self-care were appropriate for her age and sociocultural level. Her posture was upright, her speech tone was normal, and she responded with two- to three-sentence utterances. Her mood was euthymic, and her affect was congruent with her mood. The immediate memory capacity was intact. She was able to leave the house comfortably and spend time with her family in a recreational setting.

Her final Y-BOCS score was 6/40. The Beck Depression Inventory score was 9/63, and the Beck Anxiety Inventory score was 10/63. On the Mini-Mental State Examination (MMSE), she scored 30 out of 30. Figure 2 presents a comparative display of the visuospatial assessment test results at baseline and at the conclusion of therapy. Neurocognitive evaluation indicated that the patient's cognitive impairment had improved to the level of mild cognitive impairment. On the digit span test, she achieved six forward and four backward digits. In the verbal memory task, she was able to encode eight of ten items after the third repetition, retrieve five items spontaneously, and recognize three more items after 10 min. Mental control, as assessed by the Stroop test, was found to be within normal limits. Overall, her cognitive profile was consistent with mild frontal-type memory impairment. During the 2-year follow-up period, no exacerbation of OCD or memory-related symptoms was observed.

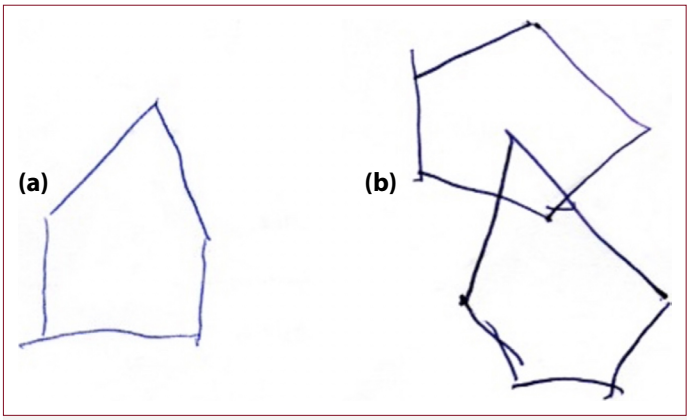

Figure 2. Drawings by the patient in the visuospatial reproduction section of the Mini-Mental State Examination (MMSE), illustrating performance before **(a)** and after **(b)** cognitive behavioral therapy.

DISCUSSION

The efficacy of CBT in the treatment of OCD has been demonstrated in numerous studies, with improvements reported not only in core OCD symptoms but also in patients presenting with comorbid anxiety and depressive features. Furthermore, these improvements have been shown to persist over long-term follow-up (Öst et al, 2022). In the present case, depressive symptoms were associated with the initial diagnosis of OCD. The observed reductions in OCD and depressive symptoms over the 2-year follow-up period were consistent with the existing literature on long-term therapeutic response.

Impairments in executive functioning, reduced information processing speed, and neurocognitive deficits are findings consistently reported in the literature on OCD (Segalas et al, 2008; Shin et al, 2014; Suhas & Rao, 2019). There are differing hypotheses as to whether these deficits are primary features of OCD or secondary developments related to the disorder. In this case, the observed neurocognitive impairments are

likely to have emerged within the framework of OCD itself, co-occurring depressive symptoms, psychotropic medication use, and age-related neurobiological changes. However, it is not possible to determine the extent to which each factor contributed to the deficit.

It has been reported that individuals with OCD may exhibit impairments in iconic memory, which could significantly influence the amount of information transferred to their visual memory or visual processing systems (Mart & Tümkaya, 2021). In a study comparing treatment-resistant patients with OCD with a control group, impairments in information processing speed were identified independently of clinical symptom severity (Simón-Martínez et al, 2021). Another study comparing 43 patients diagnosed with OCD to healthy controls using neuropsychological tests found that patients with OCD exhibited differences in frontal lobe functions (Yazdi-Ravandi et al, 2021). Additional studies have indicated that patients with OCD often experience deficits in verbal and spatial memory, decision-making, processing speed, fluency, information encoding, and executive functions (Abramovitch et al, 2013; Aydın & Öyeçkin, 2013; Suhas & Rao, 2019).

Nonetheless, in the context of such neurocognitive impairments, perspectives suggest that CBT may be insufficiently effective in patients with cognitive deficits, regardless of the primary psychiatric diagnosis (Abramowitz, 1996; Aydın & Öyeçkin, 2013; Hamatani et al, 2020; Moritz et al, 2005; Olatunji et al, 2013). In the initial assessment of this case, impairments were observed in the recall phase and visual repetition tasks, and the patient did not appear to possess the level of memory retrieval required to establish cause-and-effect relationships. Therefore, the suitability of fully structured CBT for this patient is questionable. However, modifications were made to the structure and content of the therapy sessions by taking into account the patient's cognitive profile. In light of the literature suggesting that impairments in memory and executive functioning do not necessarily predict poor response to CBT in patients with OCD—and may even be associated with better outcomes compared to other therapeutic modalities (Moritz et al, 2005; Simon et al, 2015; Vandborg et al, 2016)—CBT stands out as a treatment approach that allows for flexible adaptation for patients with cognitive deficits.

Despite being considered a first-line treatment for OCD, the application of CBT in patients with neurocognitive impairments remains underexplored in the literature. In this chronic case with insufficient response to multiple pharmacological treatments, therapy sessions were tailored to the patient's neurocognitive level and functional limitations. Interventions were designed to address cognitive process-related deficits. Session durations were shortened, frequent feedback was incorporated, guided discovery was delivered using shorter, simplified statements, and cues were provided to facilitate responses. Between-session tasks included keeping a written log of therapeutic exercises, behavioral activation, and the use of word and number games as neurocognitive exercises. The therapeutic approach concurrently targeted OCD symptoms, depressive features, and cognitive impairments. Improvements in OCD, depressive symptoms, and neurocognitive deficits appeared to occur concurrently, accompanied by a gradual reduction in psychotropic medication use.

Taken together, these findings suggest that clinicians should avoid prematurely concluding that patients with comorbid OCD and neurocognitive impairments are unsuitable candidates for CBT. The presentation of the session structure, therapy content, and action planning through individualized programming may enhance treatment adherence and ultimately improve therapeutic efficacy.

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