REVIEW

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Obsessive-compulsive disorder: Unearthing a hidden problem

ABSTRACT

Obsessive-compulsive disorder (OCD) is the fourth most common psychiatric disorder. Yet patients often avoid seeking help because they are ashamed. Diagnosis is difficult, but familiarity with the nature of OCD and its current management helps primary care physicians identify patients with OCD and make informed judgments about treatment and referral. We review common symptoms, causes, drug therapy, behavioral therapy, and quality of life issues in patients with OCD.

KEY POINTS

Contamination obsessions, usually characterized by fear of dirt, germs, or bodily secretions, are the most common form of OCD.

Patients with OCD may have raw hands from excessive washing, ask their physician about germs and contamination, or make excessive requests for medical reassurance.

In general, drug treatment of OCD produces a swifter response, whereas behavioral therapy produces a more durable response.

Selective serotonin reuptake inhibitors are the first-line drugs of choice for OCD; doses are higher than for depression, and treatment may take up to 12 weeks to show a response.

Exposure and response prevention is the psychotherapeutic treatment of choice.

PEOPLE WITH OBSESSIVE-COMPULSIVE disorder (OCD) are not "crazy," but they often think they are, and so they avoid seeking help. The time from the first appearance of recurrent, time-consuming obsessions and compulsions to the diagnosis of OCD is, on average, 17 years.[1] During this time, OCD interferes with interpersonal relationships, academic achievement, and work, often to a point where it is disabling.

Primary care physicians familiar with the nature and treatment of OCD can identify patients with OCD and make informed judgments about treatment and referral.

We review common symptoms, causes, drug therapy, behavioral therapy, and quality-of-life issues in patients with OCD.

OBSESSIVE-COMPULSIVE DISORDER IS COMMON

OCD is a common anxiety disorder with a lifetime prevalence rate of 2% to 3%.[2] It is the fourth most common psychiatric disorder in the United States after depression, substance abuse, and phobias.[3] It is equally common in men and women, usually beginning in adolescence or early adulthood and sometimes in childhood.[2,4]

OCD does not spare any culture. A study of seven international epidemiologic surveys found lifetime prevalence rates of OCD remarkably consistent among the different countries. Most of the prevalence rates fell within the range of 1.9% (Korea) to 2.5% (Puerto Rico).[5]

A DISABLING DISORDER

OCD has a significant negative impact on the quality of life. People with OCD often isolate

Causes of obsessive-compulsive disorder

In recent years, researchers have sought a better understanding of the causes of OCD. But despite advances in research, brain imaging, and treatment, the precise underlying mechanism of OCD remains uncertain.

The association of OCD symptoms with certain neurologic disorders (eg, Tourette syndrome), the presence of neuropsychologic deficits in some patients with OCD, and the abnormalities in structural and functional brain imaging found in OCD patients strongly support a neurobiologic basis of OCD. Evidence from functional imaging studies suggests dysfunction of the prefrontal cortex, cingulate gyrus, and basal ganglia in patients with OCD.[23]

A prefrontal cortico-striato-thalamic brainstem circuit is implicated in the mediation of symptoms of OCD.[11,24,25] One study points to hyperactivity of these neurocircuitry loops.[23] More than a single neurotransmitter is probably responsible for the expression of symptoms. Most drug treatment studies in patients with OCD, however, verify an alteration in serotonin as one mechanism.[24,26] Other neurotransmitters that may play a role are dopamine, glutamate, and gamma amino butyric acid.[24]

themselves from social interactions, and the symptoms and ritual behavior are often time-consuming, bizarre, and distressing. OCD interferes with interpersonal relationships, academic achievement, and work.

Hollander et al[1] found that 58% of OCD patients had lowered academic achievements, 66% had lowered career aspirations, 47% experienced work interference, and 40% were unable to work for an average of 2 years due to their symptoms. The estimated lifetime indirect costs due to lost wages was $40 billion.[1]

CLINICAL FEATURES

The hallmark of OCD is recurrent, time-consuming obsessions and compulsions that cause marked distress or significant functional impairment. The person usually recognizes the obsessions and compulsions as being unreasonable, excessive, or "crazy."[4]

Obsessions are not simply excessive worries about real-life problems, but rather thoughts, impulses, or images that are intrusive and inappropriate, causing severe anxiety. Although an obsession is a product of a person's own mind, the content is not within his or her control.

People with OCD seem to overestimate the danger associated with their upsetting thoughts. Hence, they experience extreme levels of anxiety.

Compulsions are repetitive behaviors (eg, checking) or mental acts (eg, counting, reassuring) through which the person attempts to neutralize the anxiety associated with the obsessions.

COMMON OBSESSIONS AND COMPULSIONS

Obsessions and compulsions may take several forms. Most people with OCD have a combination of symptoms, and certain symptoms predominate at different times in the course of the illness.[6] In most patients, the disorder waxes and wanes.

OCD disrupts interpersonal relationships, academic achievement, and work

Contamination

A 40-year-old woman, when visiting the hair salon, always wipes the chair with alcohol, wipes the whole counter, demands a new clean hairbrush and towels, washes her hands, and asks the employees to wash theirs—a process that takes approximately 20 minutes.

This woman has the most common form of OCD: contamination obsessions, usually characterized by fear of dirt, germs, or bodily secretions. The person may fear contracting a disease or spreading it to others, especially loved ones.

The compulsions most commonly associated with contamination obsessions involve rituals of washing, wiping, or cleaning. Other people with this form of OCD may simply avoid certain situations to prevent contact with germs.[7]

TABLE 1

A quick initial screen for obsessive-compulsive disorder

Do you have frequent unwanted thoughts that bother you and seem uncontrollable?
Do you worry about germs a lot?
Do you keep checking things over and over again, such as the stove or locks?
Do you have certain rituals that you have to repeat over and over again?
Do you have to have things "perfect" or "just right"?
Do these thoughts or behaviors take a long time in your day?

Pathologic doubt

"Checkers," who are obsessed with doubt, are concerned that they will harm others through carelessness or lack of adequate checking for safety.[7]

A common example is fear of hurting someone while driving, which may lead to driving back over and over again to the same spot after hitting a bump in the road. Another example is checking the stove repeatedly for fear of causing a fire. The checking, however, tends to lead to greater doubt, which leads to more checking.[6]

Obsessional slowness

Some people with OCD describe a need to have things perfectly symmetrical or "just right." They must always perform certain motor actions in exactly the same way, which may require undue amounts of time. The simplest of tasks, such as brushing one's teeth or getting dressed, may take hours.

Unlike most people with OCD, those with obsessional slowness do not resist their compulsions and may not describe anxious feelings if they are unable to complete the tasks. Instead, they may describe feeling "unsettled."[6,7]

Sexual, aggressive, and religious obsessions

Obsessions may include forbidden sexual thoughts or impulses involving children, animals, or homosexuality.[6] People with these obsessions may have recurrent intrusive fears of hurting their own children, even though they have no intention or desire to do so. Following delivery, a new mother with this form of OCD may not pick up her infant for fear of harming or molesting it. This may lead to avoidance of knives or sharp objects and their removal from the home, and sometimes to avoidance of the child, to the detriment of the mother-child relationship.

People with obsessive religious thoughts may go to church or confession frequently or avoid church altogether.

Other common obsessions and compulsions

- Mental counting or praying
- Somatic obsessions such as fear of cancer
- Hoarding (eg, of debris, newspapers, magazines, personal records). Hoarders often seek treatment only at the behest of a loved one and are often very resistant to all treatment efforts. They experience intense feelings of anxiety when the objects they hoard are discarded.

MAKING THE DIAGNOSIS

To qualify as OCD, obsessions or compulsions must:

- Cause marked distress
- Be time-consuming—ie, take more than 1 hour a day
- Interfere significantly with normal functioning.[4]

To qualify as OCD, behaviors must cause distress, take > 1 hour/day, and disrupt normal functioning significantly

OCD in the physician's office

Perhaps due to the shame or embarrassment that people with OCD commonly feel, they may conceal these concerns from their primary care physician. Consequently, the physician is left either to directly question the patient in this area or to infer obsessive-compulsive patterns from the patient's behavior in the office (TABLE 1). For instance, hands that appear to be raw, reddened, or excessively dry are a common finding in compulsive handwashers.

TABLE 2

Behavioral observations that suggest obsessive-compulsive disorder

Raw or reddened hands skin from excessive washing

Questions from the patient about germs or contamination

Complaints of quirky or repetitive habits from family members

Excessive requests for medical reassurance or visits by the patient

Inordinate number or intensity of health concerns

Patients who question their physician excessively about germs and "contamination" may be alluding to the object of their obsessions. Additionally, repeated requests for identical medical reassurances and an inordinate number of office or emergency room visits may hint at hypochondriacal obsessions and compulsions.

Finally, collateral complaints of unusual, quirky, or repetitive habits from family members can signal the physician to question the patient carefully about possible OCD. In fact, some patients may be hoping to receive some unsolicited assistance in order to avoid the anticipatory tension they might feel as they contemplate revealing their well-kept secrets.

Drug therapy is more swift, but behavioral therapy is more durable

Screening questions

Possible initial screening questions during an office visit (TABLE 2) include:

- Do you have frequent unwanted thoughts that seem uncontrollable?
- Do you keep checking things over and over again?
- Do you have any rituals or repetitive behaviors that consume a lot of time in the day?

OVERVIEW OF TREATMENT

Treatment of OCD usually includes cognitive-behavioral therapy, drug therapy, or both. The choice of an initial strategy takes into consideration the patient's age, the severity of the condition, and any concerns about treatment efficacy, speed, duration, tolerability, and acceptability. Consensus guidelines[8] aid in treatment selection.

Behavioral therapy consists mainly of exposure and response prevention therapy (see discussion below), which is tailored to the patient's specific symptoms: ie, contamination fears, symmetry rituals, counting, repeating, hoarding, or aggressive urges. Cognitive therapy is useful for patients with scrupulosity, moral guilt, and pathological doubt.

Drug therapy is based on inhibiting serotonin reuptake with clomipramine or one of the selective serotonin reuptake inhibitors (SSRIs).

Patient age

For prepubescent children with mild or severe OCD, cognitive-behavioral therapy is tried first. The same strategy is recommended for adolescents and adults with milder symptoms, whereas more severe symptoms may require the addition of drug therapy.

Other treatment considerations

In general, milder symptoms of OCD can be treated either with cognitive-behavioral therapy alone or with the addition of drug therapy. More severe symptoms are treated with the combination or with drug therapy alone. Drug treatment produces a swifter response in patients with OCD, but behavioral therapy produces a more durable response.

EXPOSURE AND RESPONSE PREVENTION

The most effective behavioral therapy for OCD is exposure and response prevention.[9] It is the form of behavioral therapy recommended in current consensus guidelines.[8] Success with this therapy has been reported since the middle 1960s.[9]

How it works

In OCD, the patient experiences an unwanted thought that causes distress, and then tries to alleviate the distress through repeated or ritualized behaviors or thoughts. The object of exposure and response prevention therapy in OCD is to sever the link between the unwanted thoughts and the repetitive behavior.

In a typical therapy session, the patient is exposed to an obsessional stimulus and is then prevented from performing the compulsive response. The exposure may be actu-

TABLE 3

Example of exposure hierarchy for a patient with an obsessional fear of cancer

Read an article about cancer
Watch a TV show about cancer
Talk with a person who has had cancer
Shake hands with a person who has had cancer
Hug a person who has had cancer
Share a meal with a person who has had cancer
Kiss the cheek of a person who has had cancer
Visit a cancer treatment facility
Wear a shirt that was handled by a person who has had cancer
Wear a shirt that was worn by a person who has had cancer

al or "imaginal" (ie, a simulated exposure, such as running over a sandbag or holding a knife to the rapist's neck). Repeated exposures and prevention of a response gradually habituate the patient to the distressful stimulus and enable the patient to experience it without the need to resort to escape behavior. Thus, the connection between ritual performance and anxiety reduction is gradually broken.[10]

Family and loved ones often unwittingly promote OCD behavior through reassurance

Exposure exercises are arranged on a scale from least threatening situation to most threatening, as judged by the patient (TABLE 3). For example, during a session the therapist might ask a patient with contamination obsession to tolerate the application to his or her clothing of dirt and hair of unknown origin until the patient experiences a significant reduction in perceived anxiety. The patient would not be allowed to wash his or her hands, and the therapist would ask the patient to rate the discomfort at specific intervals. Afterwards, the patient would be given instructions for carrying out the same practice at home, either alone or with a family member.

The absolute blocking of ritualized behaviors or thoughts during the exposure session is critical to the success of therapy. This includes eliminating all forms of reassurance. Rather, the therapist responds ambiguously to requests for reassurance, while coaching the patient to resist the urge to reassure himself or herself during the exposure exercises.

Exposure and response prevention is usually most effective when the exposures are more frequent and prolonged, and when the patient experiences a noticeable decrease in tension.

Patients with mild OCD often respond to weekly or biweekly sessions. If done on a weekly basis, behavior therapy may take 2 months or more to show its full effects. Patients with severe symptoms need more frequent treatment sessions (as often as three times per week) or residential (ie, inpatient) treatment. An intensive course, involving 2 to 3 hours of therapist-assisted sessions daily for 3 weeks, is a reasonable treatment approach for more severe OCD.

Doing the exercises daily at home is important

In addition to the once-a-week session in the therapist's office, the patient is instructed to do daily exercises at home. This is a very important part of the therapy, because the situations or objects that trigger OCD are unique to the patient's environment and often cannot be reproduced in the therapist's office.

For patients who need intensive therapy, the therapist may come to the patient's home or workplace to conduct treatment sessions.

Many therapists help patients perform the exercises, whereas others do not. Some assist patients with exposure exercises "in session." Others assign the exercises as homework, without in-session assistance. Whether therapist assistance is superior is equivocal.[9] Nevertheless, carrying out the exercises at home is a critical part of exposure and response prevention because it helps patients generalize their decrease in ritual performance to real-life settings.

Family involvement

Involvement of those close to the patient is also important to successful behavioral therapy. Family and loved ones often unwittingly assist the patient by reassurance, by taking on the behaviors that the patient finds threatening, or by actually performing rituals for the patient. Family members may be coached by the therapist on how to withdraw reassurance from the patient and how to refuse to assist in the performance of rituals.

Patients and family members may also be referred to the web site of the OCD Foundation (**www.ocfoundation.org**), a national organization that provides patient support, education material, and suggestions for finding a behavioral therapist.

Treatment of severe cases

Severe cases of OCD may require a more structured setting than can be found in a typical outpatient setting. Intensive outpatient programs and residential programs have been designed to assist patients with severe or disabling OCD, and these programs are directive (ie, patients are given directions), intensive, and therapist-assisted.

Outcome of behavioral therapy for OCD

About 25% of patients refuse to attempt exposure and response prevention because of the discomfort it produces. However, those who complete the treatment tend to show significant short-term and long-term benefit.

In a review of 16 studies of exposure and response prevention, Foa and Kozak[10] found that from 50% to 100% of patients responded, and that those who responded maintained these gains at anywhere from 6 to 72 months of follow-up.[10]

In an exciting study, Schwartz and colleagues[11] showed that successful exposure and response prevention led to enduring changes in the cerebral glucose metabolic rate in OCD patients when their brains were imaged with positron emission tomography: behavior change led to neuroanatomical change that is thought to be enduring. Psychotropic medicines yield a similar change in glucose metabolism in OCD patients; however, the change is not maintained when medicine is withdrawn. This argues for the value of exposure and response prevention in promoting the maintenance of treatment gains and the prevention of relapse.

Finding a behavioral therapist is not always easy

Finding a psychotherapist who performs exposure and response prevention therapy may be difficult, because many therapists find this approach difficult or personally discomforting.[9] The OCD Workbook[12] suggests that patients interview prospective psychotherapists about their competence with OCD, and this seems to be a valuable suggestion for primary care providers as well. It advises that if the therapist does not mention exposure and response prevention as part of the treatment package, the patient should consider finding another therapist. Patients in rural areas often must travel long distances to get appropriate treatment.

COGNITIVE THERAPY

In general, cognitive and behavioral therapies are commonly linked. This is also the case in the treatment of OCD. Addressing the faulty cognitions and, particularly, the overestimation of risk that is common in OCD is a routine aspect in the early phases of exposure and response prevention treatments. In fact, therapists want to understand both the level of insight of the patient and the degree to which the patient can challenge his or her own cognitive process.

Patients who see their symptoms as rather absurd or ridiculous tend to respond more favorably during treatment. Those who defend their concerns or possess what have been termed "overvalued ideas" are viewed as more resistant to treatment. Cognitive treatments are endorsed as valuable adjuncts to exposure and response prevention in the guidelines for the treatment of OCD.

Clomipramine, SSRIs most effective drugs for OCD

DRUG THERAPY

Clomipramine (Anafranil) and the SSRIs are the most effective drugs for OCD. While clomipramine and the SSRIs are equally effective, the SSRIs have a better side-effect profile, which makes them the first-line drugs. The doses needed for OCD are usually higher than for depression (**TABLE 4**), and treatment is prolonged, perhaps taking 10 to 12 weeks to elicit a response.

Clomipramine

Clomipramine, a tricyclic antidepressant and a serotonin norepinephrine reuptake inhibitor, was the first drug found to be effective in OCD and is still the gold standard by which other drugs are measured.[13] Its efficacy has

TABLE 4

Dosages of first-line medications for OCD

MEDICATION	STARTING DOSE	TARGET DOSE
Fluoxetine (Prozac)	10–20 mg daily	40–80 mg daily
Fluvoxamine (Luvox)	25–50 mg at bedtime	100–300 mg at bedtime
Sertraline (Zoloft)	25–50 mg daily	100–200 mg daily
Paroxetine (Paxil)	10–20 mg at bedtime	40–60 mg at bedtime
Citalopram (Celexa)	10–20 mg daily	40–60 mg daily
Clomipramine (Anafranil)	25–50 mg at bedtime	150–250 mg at bedtime

For additional information, literature, and referrals consult the Obsessive Compulsive Foundation website, **www.ocfoundation.org**.

been demonstrated in case studies and in placebo-controlled trials.

In 1991 the first multicenter, randomized, placebo-controlled study of this drug was conducted; dosages were 150 to 250 mg/day for 10 weeks. OCD symptoms were significantly reduced, as measured by the Yale-Brown Obsessive-Compulsive Scale: a 40% reduction with clomipramine vs 3.5% with placebo. Treatment effects were apparent at 6 weeks of treatment, with continued improvement in Yale-Brown scores.[14]

Adverse effects. Clomipramine, like all tricyclic antidepressants, has bothersome side effects. There is also a risk of lethal overdose in patients with comorbid depression. Common adverse effects are due to alpha-1-adrenergic blockade (orthostatic hypotension, dizziness), muscarinic cholinergic blockade (dry mouth, blurred vision, urinary retention, constipation), and H1 histaminic blockade (sedation, weight gain). At higher doses, sexual dysfunction may occur, and there is a small risk of seizure.[15]

Selective serotonin reuptake inhibitors

The response of OCD patients to clomipramine led to an appreciation of the important role of serotonin in this disorder. Subsequently, the favorable adverse-effect profiles of SSRIs led to research demonstrating their efficacy in OCD.[16]

Fluoxetine (Prozac), the SSRI with the longest half-life (48–96 hours), has proven effective against OCD in open-label and randomized controlled studies.[13,16] Montgomery et al[17] conducted a large, double-blind study of fluoxetine at three fixed daily doses (20 mg, 40 mg, 60 mg) vs placebo for 8 weeks. Fluoxetine 40 mg and 60 mg daily was more effective than placebo.

In clinical practice, fluoxetine is tolerated well at dosages up to 80 mg a day. Common adverse effects are nausea, insomnia, and headache.[17]

SSRIs lack some of clomipramine's side effects

Fluvoxamine (Luvox) is the SSRI with the shortest half-life and the first SSRI to be approved by the US Food and Drug Administration for use in OCD. It has been shown in several studies to be effective against OCD. Dosages range from 100 to 300 mg per day, with mild adverse effects, including nausea, fatigue, dry mouth, and insomnia. As with other SSRIs, careful dosing titration minimizes adverse effects.[13,16]

Sertraline (Zoloft) has a favorable side-effect profile and a low incidence of drug-drug interactions, making it the treatment of choice for OCD patients with concomitant medical illness.

Koran et al,[18] in a recent 80-week study at 21 sites in the United States, found sertraline to be significantly more effective than placebo in two of three primary outcome measures: dropout due to relapse or insufficient clinical response and acute exacerbation of symptoms. Sertraline also demonstrated sustained efficacy in patients responding to treatment, and

long-term treatment was well tolerated. Over the entire study period, fewer than 20% of patients withdrew from the study because of adverse effects. The mean dosage was 187 mg/day. Adverse effects were similar to those of other SSRIs, but their frequency decreased with time.[18]

Paroxetine (Paxil) and **citalopram** (Celexa) have also been shown to be effective in OCD. Dosages tested were 40 and 60 mg/day.[13,16] Paroxetine is generally the most sedating of the SSRIs and may be a good option in patients with concomitant insomnia. Citalopram is the most selective SSRI and, like sertraline, would be an excellent choice in patients taking multiple medications. Its drug-drug interaction profile is good.

MANAGING TREATMENT RESISTANCE

Reconsider the diagnosis

First-line treatments for OCD fail in about 20% of patients.[19] An initial trial of an SSRI does not work in up to 40% of OCD patients.[16] However, before labeling the patient's condition as refractory to treatment, it is important to reexamine the diagnosis, as the symptoms may be the manifestation of another diagnosis.

To be adequate, a trial of drug therapy should go for at least 10 weeks

The differential diagnosis of OCD includes:

- Affective illnesses with ruminations
- Anxiety disorders such as generalized anxiety disorder
- Psychotic disorders with delusions
- Eating disorders
- Body dysmorphic disorder
- Organic mental disorders with intrusive thoughts or stereotypy
- Impulse control disorders
- Borderline personality disorder with repetitive self-mutilation
- Obsessive-compulsive personality disorder (ie, a pervasive pattern of behavior, not a change from previous functioning, causing a clinical diagnosis).

What is an 'adequate' trial of drug therapy?

Sometimes patients who do not respond to two different SSRIs may respond to a third. First-line drug therapy should include at least three separate trials, each with a different serotonin reuptake inhibitor, and one should be clomipramine.

To be considered adequate, a trial of drug therapy should be carried out for at least 10 weeks and the dose should be titrated to the maximal tolerated dose.

Twenty hours of actual (therapist-assisted) exposure and response prevention treatment is considered an adequate trial of behavioral therapy.

Measures of treatment progress

The Yale-Brown Obsessive-Compulsive Scale is commonly used to measure symptom severity and treatment progress. It is a 10-item scale (five items assess the severity of obsessions, five items assess the severity of compulsions), and each item is rated from 0 (no symptoms) to 4 (extreme symptoms). In most trials, treatment resistance is usually defined as a total score greater than 15 during treatment. Also, failure to achieve at least a 25% reduction in the baseline score after 10 weeks of drug treatment or 20 hours of behavior therapy suggests treatment resistance.

Augmented drug therapy for refractory OCD

If OCD is refractory to drug treatment, adding an augmenting agent is an option. Drugs most often used for this include:

- Clonazepam (Klonopin) 0.5 mg to 5 mg/day, an option in patients with insomnia and anxiety
- Neuroleptics, particularly in patients with frank Tourette syndrome, tics, body dysmorphic disorder, trichotillomania (severe hair pulling)
- Buspirone (Buspar) 15 mg to 60 mg/day.[19]

Neuroleptic drugs most commonly used for this purpose are haloperidol (Haldol) 0.5 mg to 3 mg daily, and risperidone (Risperdal) 0.5 mg to 2 mg daily. Intravenous clomipramine has also been used, but only in a few centers in the United States, mostly just before considering neurosurgery.

Neurosurgery

Neurosurgery may be considered for patients with severe, debilitating, chronic OCD if behavior therapy and drug therapy fail. However, since a controlled study would be unethical, efficacy remains unproven.

Procedures include cingulotomy, anterior capsulotomy, limbic leukotomy, and subcaudate tractotomy.[20] These techniques traditionally have involved making bilateral lesions in stereotactically defined regions of the brain. A subset of patients with refractory OCD respond to these interventions.[21]

RELATED OCD SPECTRUM DISORDERS

OCD spectrum disorders—which include conditions such as Tourette syndrome, tics, trichotillomania, and other conditions in which repetitive behaviors are a key feature—involve some degree of compulsive or impulsive behavior and share some characteristics of OCD, such as age and clinical course. These may also respond to serotonin reuptake inhibitors and behavioral therapy.

OCD spectrum disorders may affect up to 10% of the US population, and the primary care physician is often the first to recognize them. They are categorized according to three core symptoms:

- Obsession with specific bodily sensation or appearance (body dysmorphic disorder, hypochondriasis, eating disorder)
- Neurological disorders such as Tourette syndrome, Sydenham chorea, autism
- Impulse control disorders such as pathologic gambling, kleptomania, and trichotillomania.

Although impulsive behavior may be as difficult to inhibit as compulsions, compulsions are an attempt to decrease anxiety, whereas impulsive behavior is an attempt to obtain pleasure and arousal.[22]

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