

REVIEW ARTICLE

Obsessive-Compulsive Disorder in Children and Adolescents

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SUMMARY

Background: Early-onset obsessive-compulsive disorder (OCD) is one of the more common mental illnesses of children and adolescents, with prevalence of 1% to 3%. Its manifestations often lead to severe impairment and to conflict in the family. In this review, we summarize the manifestations, comorbidity, pathophysiology, and course of this disease as well as current modes of diagnosis and treatment.

Methods: We selectively review the relevant literature and the German-language guidelines for the diagnosis and treatment of mental illnesses in children and adolescents.

Results: Obsessive-compulsive manifestations are of many types and cause severe impairment. Comorbid mental disturbances are present in as many as 70% of patients. The disease takes a chronic course in more than 40% of patients. Cognitive behavioral therapy is the treatment of first choice, followed by combination pharmacotherapy including selective serotonin reuptake inhibitors (SSRI) and then by SSRI alone.

Conclusion: OCD often begins in childhood or adolescence. There are empirically based neurobiological and cognitive-behavioral models of its pathophysiology. Multiaxial diagnostic evaluation permits early diagnosis. Behavioral therapy and medications are highly effective treatments, but the disorder nonetheless takes a chronic course in a large percentage of patients.

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Obsessive-compulsive disorder is common not just in adults, but also in children and adolescents. It impairs the quality of life of the affected young people but is often diagnosed only after a delay. This article is based on a selective review of the relevant literature retrieved by a PubMed search, with additional consideration of the German-language guidelines for the diagnosis and treatment of obsessive-compulsive disorder (1). In it, we provide an overview of the clinical features, comorbidities, and course of early-onset obsessive-compulsive disorder. We discuss the current explanatory approaches and the available modalities of diagnosis and treatment.

Definition and clinical features

Obsessive-compulsive disorder is a complex pathological entity that can take on a wide variety of forms. The essential clinical features for its diagnosis in children and adolescents are, according to the ICD-10 (*Box 1*), the same as those in adults:

- The patient must suffer from obsessions and/or compulsions, i.e., thoughts and/or behavioral impulses. However recognized as own thoughts, they are involuntary and often repugnant in the patient's own mind.
- At least one of these obsessions and/or compulsions must be resisted.
- The patient does not perceive the manifestations of the disorder as being pleasurable.
- The obsessions and/or compulsions occur repetitively; the patient is troubled by them and is markedly impaired by them.

According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV), the diagnosis is permissible even in children who lack insight into the inappropriateness of their obsessions and/or compulsions and do not put up any resistance to them (2). A subclassification of the disorder, depending on the degree of insight and delusional features of the obsessions and compulsions, is planned for the coming DSM-V. Children and adolescents often manifest multiple obsessive-compulsive features at the same time. Geller et al. found that the commonest types of obsessions and compulsions in this age group had to do with cleaning (32% to 87%), followed by repetition, checking, and aggressive thoughts (3). In the authors' own study, the commonest types had to do with cleaning (60%) and

BOX 1

ICD-10 criteria for obsessive-compulsive disorder (age-independent)*

For a definite diagnosis, obsessional symptoms or compulsive acts, or both, must be present on most days for at least 2 successive weeks and be a source of distress or interference with activities.

The obsessional symptoms should have the following characteristics:

- They are acknowledged as originating in the mind of the patient, and are not imposed by outside persons or influences.
- The subject tries to resist them (but if very long-standing, resistance to some obsessions or compulsions may be minimal). At least one obsession or compulsion must be present which is unsuccessfully resisted.
- Carrying out the obsessive thought or compulsive act is not in itself pleasurable. (This should be distinguished from the temporary relief of tension or anxiety).
- The thoughts, images, or impulses must be unpleasantly repetitive.

*ICD-10 Classification of Mental and Behavioral Disorders, World Health Organization, Geneva, 1992.

BOX 2

Diagnostic techniques for the evaluation of obsessive-compulsive disorder in children and adolescents

- Clinical interview for basic diagnostic assessment.
- Hamburg Obsession-Compulsion Inventory (HOCI): this is a self-assessment instrument that can be used by adolescents (e7, e18).
- Hamburg Obsession-Compulsion Inventory-Short Form (HOCI-SF), (e19).
- Leyton Obsessional Inventory: this is a self-assessment instrument that is also available in a version for children (e20).
- Children's Yale-Brown Obsessive Compulsive Scale (CY-BOCS): this is a semistructured interview for children and adolescents corresponding to the Y-BOCS for adults (e21).

checking (40%) (4). The content of obsessions and compulsions often concerns contamination (dirt, pathogens), aggression, symmetry and precision, and religious and sexual themes; mixed types are common (4). Leckman et al. used symptom-oriented checklists (the Yale-Brown Obsessive Compulsive Scale, Y-BOCS) to assess a number of symptom dimensions in adults (cleaning/washing, checking, symmetry/exactness and hoarding/saving); multiple authors have since validated this approach (5–7). These symptom dimensions are highly stable (8).

Epidemiology

The prevalence of obsessive-compulsive disorder among children and adolescents is in the range of 1% to

3% (9, 10). According to the US National Comorbidity Survey Replication (NCS-R) by Kessler et al., about 20% of all affected persons in the USA suffer from manifestations of the disorder at age 10 or even earlier (11, 12). Delorme et al. consider the disorder to have a bimodal age distribution, with a first peak at age 11 and a second one in early adulthood (13). Among the affected children, there seem to be more boys than girls, in a ratio of about 3:2, although this has not been confirmed in all of the relevant studies (14, 15). From adolescence onward, the prevalence in boys and girls is the same.

Diagnosis and differential diagnosis

In children and adolescents, as in adults, obsessive-compulsive disorder is often long overlooked by others and/or hidden by the sufferer. In our own studies, treatment was begun at an average age of 13 years; this, in turn, was an average of two years after the disease manifestations began (16). When taking the history and conducting an exploratory interview, the examiner should carefully search for the core manifestations, possible comorbidities, and psychosocial impairments that may arise as the patient develops and the illness progresses. Within the framework of the multiaxial psychiatric diagnostic approach that should be used for all patients, standardized psychodiagnostic procedures are now available for the assessment of the specific manifestations of obsessive-compulsive disorder (1) (Box 2).

Behavioral analysis for the planning and provision of treatment comprises the following elements:

- The manifestations and severity of the patient's obsessions and/or compulsions
- Internal and external precipitating factors
- Fears or expectations about what would happen if the compulsive rituals were not performed
- Defense mechanisms (what types of behavior does the patient already use to help himself or herself?)
- Reactions of family members and other persons in a close relationship with the patient (involvement; protective resources, reinforcing influences).

The differential diagnosis involves distinguishing obsessive-compulsive disorder from a number of other entities (Box 3).

Comorbidities

Comorbid disorders are reportedly present in 68% to 100% of cases and are thus the rule rather than the exception (4). The most common types of comorbidity are anxiety disorders, tic disorders, attention deficit/hyperactivity disorder (ADHD), and personality disorders, which become more common with advancing age. Recent studies have revealed higher rates of externalizing behavioral disorders (ADHD, conduct disorders) (17, 18). The more severe the obsessive-compulsive disorder, the more likely it is that there will be one or more comorbid disorders (4, 19, 20).

BOX 3

Possible differential diagnoses of obsessive-compulsive disorder in children and adolescents

- Subclinical compulsive behaviors: these are defined as behaviors lying within the normal range that do not impair the child's development.
- Rituals that help the child to process experiences and obtain security: these are calming rather than stress-inducing behaviors.
- Compulsive behavior in the setting of medical illness: this does not have the same functional significance as compulsive behavior in OCD.
- Obsessive thoughts arising in the setting of another Axis I disorder, such as a phobia, eating disorder, or depression: the content of such thoughts is related exclusively to central aspects of the Axis I disorder. Depressive brooding, for example, is egosyntonic.
- Obsessive-compulsive personality disorder: this is experienced as egosyntonic, and the typical obsessions and compulsions of OCD are absent.
- Schizophrenia and delusional disorders: the distinguishing features of OCD are egodystonia and preserved reality testing.
- Autistic disorders: obsessive-compulsive manifestations in autistic persons are generally experienced as egosyntonic and do not cause distress.
- Obsessive-compulsive spectrum disorders: obsessions and compulsions can be difficult to distinguish from hypochondriasis, dysmorphophobia, and impulse-control disorders.
- Apparently compulsive tics (e.g., in complex motor tic disorders): tics and compulsions are sometimes very hard to tell apart. Tics are characterized by bodily tension; the behaviors are not goal-directed, nor are they connected with fears or anxieties, and it is difficult or impossible to suppress them voluntarily.
- Stereotypic behaviors, e.g., in autistic or mentally retarded persons: these are experienced as pleasurable by the affected persons, as they offer a means of self-stimulation during sensory deprivation, or, alternatively, a means of distraction during sensory overload.
- Rigidity in ADHD: this can be regarded as an attempt to regain control over the inner chaos of one's own mental world.

The course of early-onset obsessive-compulsive disorder

Studies of the course of obsessive-compulsive disorder reveal that it often becomes a chronic condition. In a meta-analysis of (mostly American) studies on the long-term course of obsessive-compulsive disorder in children and adolescents, involving a total of 521 patients, Stewart et al. found a mean persistence rate of 41% for the florid disorder, and one of 60% when subclinical manifestations were taken into account (21). The available studies from Europe to date include a Danish retrospective study of disease course by Thomsen et al. and a study from Würzburg, Germany, by Wewetzer et al. (22, 23). In the Danish study, only 13 (28%) of the 47 patients were in remission with respect to their obsessive-compulsive manifestations after a mean follow-up interval of 15 years (22). Wewetzer et al. arrived at similar findings after more than 11 years of follow-up (23): 70% of the original patient group still suffered from mental disorders at the end of this interval, and 36% of them had persistent obsessive-compulsive disorder. Another, more recent study from Würzburg is the first to assess the middle- to long-term course of obsessive-compulsive disorder prospectively. Patients' age of onset was 11.3 years; just under six years after baseline assessment, the findings were nearly identical to those of the previous study (24, 25). In both of the Würzburg studies, however, the severity of the disorder, measured with the Y-BOCS, was significantly lower immediately after the initial treatment, and also at the time of follow-up (23, 24).

A recent prospective study showed that ADHD, when present as a comorbid disorder, is associated with more severe obsessive-compulsive disorder and a less favorable course (20). The few studies performed to date on the course of early-onset obsessive-compulsive disorder have shown that these patients have their most severe adaptive disturbances in the areas of social integration, age-appropriate development of independence from the family, and relationships (25, e1, e2). Early initiation of treatment, and the continuation of treatment once it is initiated, are associated with better outcomes (20, 25). It is, therefore, all the more important to diagnose obsessive-compulsive disorder early, as appropriate treatment improves the prognosis in addition to relieving the patient's current symptoms (*Box 3*).

Etiology

There are both neurobiological and metacognitive-behavioral findings and models pertaining to the causation of obsessive-compulsive disorder.

Neurobiological approaches

First-degree relatives of children and adolescents with obsessive-compulsive disorder are 3 to 12 times more likely to also have the disorder than the general population. The earlier the age of onset, the more frequently first-degree relatives are affected (e3). Twin studies show somewhat greater heritability of obsessive-compulsive symptoms in children (0.45% to 0.65%) than in adults (0.27% to 0.47%) (e4). Thus, the studies reveal a strong influence of genetic factors in the

CASE ILLUSTRATION

A 10-year-old girl was admitted to the inpatient child and adolescent psychiatry ward on her parents' referral. She said she had begun blowing in the air after her grandfather's death, because she was not permitted to think about him when away from home. Any thoughts that she might have about her family when she was in other surroundings had to be "blown away." Later, she had to wash her hands after touching any persons outside her family that she didn't like, or even anything belonging to such a person. By now, she no longer needed to wash her hands and could just rub them. She explained that she did this, not to rub off actual dirt, but to rub off "the dirt you can't see," i.e., the strangeness of the people and things involved, which "grossed her out." Her parents related that she had lost many friends through these behaviors, and that her rituals also interfered with her schoolwork, causing low grades.

Treatment:

The following treatment plan was developed:

- Education of the patient and her parents about obsessive-compulsive disorder.
- Confrontational exercises with response prevention, e.g., touching "gross" objects and then not being able to rub off the supposed contamination.
- Discussion with the parents of ways to foster their daughter's autonomy.
- Social competence exercises to enable her to express her desires, aggressive thoughts, etc., in a situationally appropriate way.

Course:

The treatment outlined above brought about marked, but incomplete, improvement of this patient's obsessions and compulsions. The long duration of the illness until it was diagnosed and its severity on presentation were unfavorable prognostic factors.

causation of early-onset obsessive-compulsive disorder (e3). On the other hand, the later the disease arises, the larger the role played by environmental conditions and traumata. Pertinent neuroimaging studies, along with neuropsychological findings indicating executive dysfunction (e.g., impaired reaction suppression and poor performance of planning tasks), suggest a disturbance of information processing in cortico-striato-thalamo-cortical circuits. The reported benefit of treatment with deep brain stimulation (DBS) lend additional support to this hypothesis (e5).

Obsessive-compulsive manifestations due to infectious diseases

Obsessive-compulsive manifestations arising in the setting of infection with beta-hemolytic streptococci are subsumed under the acronymic heading "PANDAS" (pediatric autoimmune neuropsychiatric disorders associated with streptococcal infections). The pathophysiological mechanism seems to be a cross-reaction in which antibodies primarily directed against group A beta-hemolytic streptococci react with the basal ganglia as well. The prevalence of PANDAS is unknown (e6). The manifestations arise suddenly, are often very severe, and regress between

episodes. Snider et al. were the first to demonstrate the efficacy of antibiotic prophylaxis (e7, e8), which, however, is not routinely given in clinical practice.

The cause of dysfunctional interpretative patterns

According to metacognitive-behavioral findings and models, obsessive-compulsive disorders are due to the dysfunctional interpretative patterns employed by patients in response to intrusive negative thoughts that are actually normal (e9). Such patterns (e9, e10) lead, for example, to heightened perceptions of danger and personal responsibility, and to the subjective urgency of putting an end to troubling thoughts through aversive behavior. The patient's attempts to avoid thinking intrusive thoughts, or to suppress them, have the opposite effect, as they only heighten the patient's preoccupation with these thoughts. Short-term relief reinforces the behavior and lends greater subjective importance to the intrusive thoughts, so that the patient's continuous preoccupation with them becomes further stabilized. The affected individual is now trapped in a vicious circle of intrusive thoughts and attempts to resist them, or to neutralize them with compulsive behaviors. The cognitive model has not been studied as intensively in children and adolescents as it has in adults.

Persons in the child or adolescent patient's near environment, particularly parents, very often participate in the compulsive behavior, e.g., by repeatedly answering the questions of children who have a questioning/checking compulsion or by giving free rein to a repetitive washing compulsion. They may do so in order to avoid the aggressive reactions that commonly result when they try to put an end to the compulsive behavior by using parental discipline. In this way, they unintentionally maintain the vicious circle.

Psychotherapy

The findings of a meta-analysis of all of the randomized controlled trials and open trials of cognitive behavioral therapy (CBT) that have been performed to date (e11) indicate that this type of treatment is highly effective (mean effect size, 1.55). The mean effect size of individual CBT was nearly as high as that of CBT with greater involvement of the family (1.77 and 1.88, respectively). Behavioral therapy (BT) consisting of exposure and response prevention has been found to be very effective: The patient exposes himself or herself to situations and obsessive thoughts that provoke anxiety, and their passive or active avoidance through neutralizing compulsive behaviors is prevented. The patient learns that the unpleasant emotions evoked in this way become progressively weaker and can ultimately be handled without any compulsive behavior. Real exposures are preferable to imagined ones; for some types of obsession/compulsion, additional imagination exercises are needed. BT should generally begin with situations of less than maximal severity in order not to bring out avoidant behavior. The initial situation

should be chosen so that it can be created in controlled fashion in a familiar therapeutic setting that provides the patient with a degree of emotional security; it should also be of practical relevance to the patient. A cautious, graduated approach works just as well as a rapid, flooding approach. Children and adolescents generally prefer a less stressful, step-wise approach in which the intensity of the precipitating factor is gradually increased, even though this takes somewhat longer. The objective is a marked diminution of agitation or tension, down to a level that the child or adolescent patient can cope with without having to perform the compulsive behavior, followed by a generalization of the progress that has been achieved to the setting of the patient's everyday life. Psychoeducation of the parents is necessary as well.

Treatment by exposure can also be performed when the problem consists purely of obsessive thoughts, without any accompanying compulsive behavior. A distinction should be drawn between the intrusive thoughts and the neutralizing thoughts that arise in response to them. The goal of exposure is to provoke the intrusive thoughts; this can be done by administering external stimuli associated with them, or by describing them out loud on an audio recording and then playing the recording back. The neutralizing thoughts must not be allowed to arise during the exposure. One can ensure this, for example, by administering the exposure continuously, so that there is no time for "neutralization" to occur. In CBT, special attention is paid to the therapeutic relationship, the elucidation of the patient's motivation and the goals of treatment, and the functional role of obsessions and compulsions. Improvement after behavioral therapy seems to be stable in the long term: patients examined 3 years after treatment were even found to have a further, mild improvement of their symptoms (e12).

Pharmacotherapy

Selective serotonin reuptake inhibitors (SSRIs) are the drugs of first choice for children and adolescents with obsessive-compulsive disorder because they are both highly effective and well tolerated. Geller et al. performed a meta-analysis of 12 randomized, double-blind, placebo-controlled studies of the effects of SSRIs and clomipramine (a tricyclic antidepressant) that involved a total of 1044 children and adolescents (e13). The pooled effect strength of SSRIs and clomipramine in comparison to placebo was determined to be 0.46. Thus, the effect of these drugs was highly statistically significant, but only moderately strong, in fact weaker than that of behavioral therapy. Later studies, however, revealed stronger effects for both behavioral therapy and medication. Clomipramine was found to be the most effective drug in children and adolescents, as it is in adults. In Germany, clomipramine is approved for the treatment of enuresis, but not of obsessive-compulsive disorder, in children aged 5 years or older. Among the SSRI's, fluvoxamine is approved in

Germany for the treatment of obsessive-compulsive disorder in children aged 8 or older. The SSRI's do not differ from each other in their efficacy at improving the manifestations of the disease. The recommended doses for children and adolescents largely correspond to those for adults and are higher than the recommended doses of the same medications in the treatment of depressive disorders (for more on this topic, cf. Gerlach et al., 2009) (e14). The authors recommend therapeutic drug monitoring in children. Even though clomipramine is highly effective, it also has pronounced adverse effects and is therefore a third-choice drug. When either an SSRI or clomipramine is given, the beneficial effect should be expected to set in only after 4 to 10 weeks of treatment, and thus the effect should only be judged after 8 to 12 weeks have elapsed. If one SSRI should prove ineffective, another SSRI should be tried next; if the disease manifestations do not improve in response to the second SSRI either, one can consider adding an atypical neuroleptic drug, particularly if the patient suffers from a comorbid tic disorder. When switching drugs or giving combination therapy, one should keep in mind that SSRIs differ markedly from one another in pharmacokinetics (e15). Pharmacotherapy should be planned for the long term; attempts to taper and discontinue the drug(s) should always be carried out very slowly and no sooner than 6 months after the start of treatment, even if the initial treatment has been highly successful. Studies of the effects of CBT, medications, and combination therapy compared to placebo have shown that CBT is superior to the other options, but that the best effect of all can be obtained through a combination of CBT with medications [see e.g. the Pediatric OCD Treatment Study, POTS, (2004) (e16)].

Treatment recommendations and future prospects

Eight studies involving a total of 343 children and adolescents with obsessive-compulsive disorder who were treated with behavioral therapy (BT with exposure) or cognitive behavioral therapy (CBT with exposure and cognitive elements) were reviewed in a Cochrane analysis (e17). Separate analysis of BT and CBT was not possible, so the two together were compared to pharmacotherapy and combination therapy. BT/CBT was found to be just as effective as treatment with an SSRI alone, and limited evidence was found for an even better effect from BT/CBT combined with medication. The drop-out rate was lower with BT/CBT than with medication. The authors of the Cochrane analysis concluded that the data did not support any particular recommendation for which of the two, BT/CBT or medication, should be given first. In view of the demonstrated and lasting effectiveness of behavioral therapy (i.e., BT or CBT), the current German-language guidelines recommend using these methods first to treat obsessive-compulsive disorder in childhood. For patients with longstanding, intractable manifestations of obsessive-compulsive disorder

that continue well into adulthood, studies have shown that deep brain stimulation can be an effective treatment. This mode of treatment is not currently under discussion for children and adolescents. Further treatment options would be desirable for patients whose illness takes a particularly long, severe, and intractable course.

Overview

Obsessive-compulsive disorder is common but often diagnosed late in children and adolescents, just as in adults. Standardized diagnostic techniques are available. Possible comorbidities should be considered. Improvement can be achieved with behavioral therapy, e.g., exposure and response prevention, either alone or in combination with SSRI. The authors' findings point to the importance of treating obsessive-compulsive disorder early. As this illness tends to become chronic, it seems wise for all patients to undergo psychotherapy (perhaps at low frequency), alone or in combination with medications, once the initial phase of intensive treatment has been completed, even if it has been highly successful.

KEY MESSAGES

- Obsessive-compulsive disorder is common among children and adolescents and causes marked distress.
- Psychological, neurobiological, and genetic factors participate in its causation.
- The treatment of choice is exposure with response prevention, potentially supplemented by cognitive interventions and involvement of the patient's family.
- The SSRI are the drugs of first choice.
- The sooner treatment is begun, the more favorable the course.

Conflict of interest statement

Prof. Walitza has received lecture honoraria from Janssen Cilag and AstraZeneca.

Prof. Warnke cooperates in research and lecture activities with Medice, Novartis, Lilly, Janssen-Cilag, AstraZeneca and Shire.

PD Melfsen, Dr. Zellmann, Dr. Jans, and Prof. Wewetzer state that they have no conflict of interest as defined by the guidelines of the International Committee of Medical Journal Editors.

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