

THE NATURE, ASSESSMENT, AND TREATMENT OF PEDIATRIC OBSESSIVE-COMPULSIVE DISORDER

Mary Keeley¹ and Eric A. Storch²

¹*University of Florida;* ²*University of South Florida (USA)*

Abstract

Obsessive-compulsive disorder (OCD) is an anxiety disorder characterized by recurrent or persistent thoughts, impulses, or images that are experienced as intrusive or distressing (obsessions), and repetitive behaviors or mental acts (compulsions) often performed in response to an obsession. Approximately 1-4% of children and adolescents are affected by OCD at some point during youth, and the disorder is characterized by broad impairments in academic, social, and family functioning. This paper reviews the nature of obsessive-compulsive symptoms as well as etiological explanations for the disorder. Additionally, the topic of evidence-based assessment and treatment of OCD is discussed, with a particular focus on cognitive-behavioral treatment. We conclude with a discussion of future directions for the field.

KEY WORDS: *obsessive-compulsive disorder, children, treatment, review.*

Resumen

El trastorno obsesivo-compulsivo (TOC) es un trastorno de ansiedad caracterizado por pensamientos, impulsos o imágenes recurrentes o persistentes, que se experimentan como intrusos o perturbadores (obsesiones) y comportamientos o actos mentales repetitivos (compulsiones) que se realizan en respuesta a una obsesión. Aproximadamente del 1 al 4% de los niños y adolescentes presentan TOC en algún momento durante la niñez y la juventud, caracterizándose el trastorno por un importante deterioro en el funcionamiento académico, social y familiar. Este artículo revisa la naturaleza de los síntomas del trastorno obsesivo-compulsivo, así como las explicaciones etiológicas de este trastorno. Además, se discute sobre el tema de la evaluación y el tratamiento basados en la evidencia, con atención especial en el tratamiento cognitivo-conductual. Se concluye con una discusión sobre las directrices futuras para el campo.

PALABRAS CLAVE: *trastorno obsesivo-compulsivo, niños, adolescentes, tratamiento, revisión.*

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Correspondence: Eric Storch, Department of Pediatrics, University of South Florida, 800 6th St South, Box 7523, St. Petersburg, Florida 33701 (USA). E-mail: estorch@health.usf.edu

Obsessive-Compulsive Disorder (OCD) is an anxiety disorder characterized by the presence of recurrent and persistent obsessions and/or compulsions that are distressing, time consuming (more than one hour per day), or cause significant interference with normal functioning (American Psychiatric Association [APA], 2000). One of the most common childhood psychiatric illnesses, OCD affects approximately 1-4% of children and adolescents before adulthood (Douglass, Moffit, Dar, McGee, Silva, 1995; Zohar, 1999). These rates may even be an underestimation of the true prevalence of the disorder in youth, given childhood tendencies to be secretive about embarrassing thoughts/behaviors, parental difficulty in recognizing OCD symptoms, and limited insight among youth with OCD symptoms (American Academy of Child and Adolescent Psychiatry [AACAP], 1998). If left untreated, OCD can take a chronic and debilitating course, with studies finding that early OCD-related impairments are associated with later interpersonal and psychological difficulties in adulthood (Thomsen & Mikkelsen, 1995; Flament, Koby, Rapoport, & Berg, 1990). Although some variation in the level of functional impairment exists, OCD symptoms generally have detrimental effects on academic, social, and family functioning (Flament et al., 1988; Leonard, Swedo, Lenane, Rattew, Hamberger, & Bartko, 1993; Piacentini, Bergman, Keller, & McCracken, 2003), and recent research has highlighted the negative effect that the disorder has on the child's overall quality of life (Storch, Lack, Keeley, Geffken et al., 2007a). The bimodal age of onset distribution has an initial peak incidence occurring pre-puberty, in which males are more commonly affected than females (Geller et al., 1998), and a second peak incidence occurring in early adulthood, during which gender differences disappear (Parkin, 1997; Pauls, Alsobrook, Goodman, Rasumussen, & Leckman, 1995). Substantial comorbidity exists among youth with OCD (e.g., Masi et al., 2005; Storch et al., 2008), with one epidemiological study revealing that 84% of youth diagnosed with OCD had comorbid disorders, including major depression (62%), social phobia (38%), alcohol dependence (24%), and dysthymia (22%) (Douglass et al., 1995).

Symptom presentation

Obsessions are persistent and intrusive thoughts, ideas, impulses or images that lead to increased levels of anxiety and accompanying distress. Among the most common obsessive themes in the pediatric population are fears of contamination (e.g., dirt, germs, toxins); concerns about harm to self or others; preoccupations with symmetry, exactness, and order; concerns regarding religious or moral conduct (e.g., being concerned with committing a sin); lucky or unlucky numbers, and preoccupations concerning forbidden sexual or aggressive thoughts (Masi et al., 2005; Swedo, Rapoport, Leonard, Lenane, & Cheslow, 1989).

Compulsions are repetitive or ritualistic behaviors or mental acts that serve to temporarily reduce or prevent anxiety associated with an obsession. Among the most common compulsive themes are cleaning or decontamination rituals (e.g., excessive washing, bathing, or grooming); checking, counting, repeating, straightening, and routinized behaviors (e.g., doors, locks, homework, appliances);

confessing, praying, and reassurance seeking; touching, tapping, and rubbing; measures to prevent harm to self or others; and hoarding and collecting (Masi et al., 2005; Swedo et al., 1989). Typically, youth with OCD have multiple obsessions and compulsions, and certain compulsions (e.g., handwashing) are linked with certain obsessions (e.g., contamination fears).

Several adult studies have consistently identified distinct symptom dimensions of OCD. Sookman et al. (2005) highlighted four overt symptom subtypes that have been consistently recognized (through factor and cluster analyses) across samples of patients with OCD: contamination/cleaning, doubting/checking, obsessions without compulsions (e.g., religious, sexual, or aggressive obsessions), and hoarding. Researchers purport that identifying symptom dimensions in youth with OCD has significant implications for establishing developmental trajectories for the disorder as well as for predicting response to both psychological and pharmacological interventions (McKay et al., 2006). Few studies have examined symptom dimensions in youth, however, and these studies have yielded inconsistent findings, with one study identifying similar factors as found in adult studies (Stewart et al., 2007) while another study found a factor structure different in content from adult studies (McKay et al., 2006). Although there is limited research examining the unique clinical presentations of specific symptom dimensions in youth with OCD, one recent study reported that, relative to non-hoarders, youth with hoarding symptoms exhibited worse insight, a finding that has been shown consistently within the adult literature (Storch, Lack, Merlo, Geffken et al., 2007b). Additionally, hoarders had higher levels of internalizing and externalizing symptoms, as well as higher rates of panic disorder, relative to non-hoarders. In another study investigating the impact of treatment specific symptom dimensions on treatment response in pediatric OCD, results indicated that youth who exhibited aggressive/checking symptoms were more likely to respond to treatment compared to youth who did not present with those symptoms (Storch et al., 2008). Additionally, although the results were not statistically significant, findings from this study also indicated that youth with hoarding symptoms displayed the lowest treatment response rates (64.3%) followed by youth with sexual/religious symptoms (72.5%).

In addition to common obsessive and compulsive themes, there are a number of miscellaneous symptoms that occur with increased frequency among youth (Storch et al., 2007c). For example, youth often report having obsessions related to a need to know/remember and a fear of saying certain things. Additionally, youth often report having compulsions related to a need to tell/ask/confess, need to touch/tap/rub, or a need to do things until it feels "just right." Research has indicated that many of these miscellaneous symptoms are related to distinct symptom dimensions (e.g., contamination/cleaning associated with need to tell/ask/confess; Storch et al., 2007c).

Developmental considerations

Demographic and clinical characteristics

Research has supported a distinction between early and late onset OCD, highlighting that youth with early onset (i.e., prepubertal) OCD are more likely to be male and to have comorbid tic symptoms (Chabane et al., 2005; Tükel et al., 2005). Additionally, youth with early onset OCD are more likely to have compulsions without experiencing any identifiable obsession, and they typically exhibit a greater percentage of tactile compulsions (i.e., touching, tapping, rubbing) (Flament, Geller, Irak, & Blier, 2007; Freeman et al., 2003). Compared to adults, youth with OCD often have less insight into their symptoms, and may be less bothered by their obsessions and compulsions (i.e., experience their symptoms as ego-syntonic; AACAP, 1998). Furthermore, the range of comorbid conditions among youth with OCD is broader than adults with the disorder, with common comorbid conditions in youth including disruptive behavior disorders, developmental disorders, and anxiety and mood disorders (Masi et al., 2005, Storch et al., 2008).

Cognitive factors

Recent research has indicated developmental differences in cognitive processing of among patients with OCD, such that children with OCD have been found to experience fewer intrusive thoughts, which were reportedly less distressing and less controllable, when compared to adolescents and adults with OCD (Farrell & Barrett, 2006). Despite experiencing fewer intrusive thoughts than adults, research has indicated that children with OCD experience similar types of cognitive distortions as identified by the Obsessive Compulsive Cognitions Working Group (OCCWG; 1997). Furthermore, although children experience lower rates of some distortions (e.g., probability biases, responsibility biases), research has revealed that children experience comparable rates of other distortions (e.g., thought-action fusion, self-doubt; Farrell & Barrett, 2006).

Family factors

In addition to cognitive processes, another developmental consideration pertains to family involvement and functioning. Children with OCD involve their family members in their rituals in a myriad of ways, including asking for verbal reassurance, requesting assistance with ritual completion (e.g., checking locks), and demanding schedule modifications to avoid feared stimuli (Calvoroceossi et al., 1995; Storch, Geffken, Merlo, Jacob et al., 2007d). Family accommodation of symptoms is a frequent phenomenon, and studies have revealed a relation between family accommodation and symptom severity, emotional and behavioral problems, and functional impairment (Storch, Geffken, Merlo, Jacob et al., 2007d). Although

accommodation of symptoms is often well-intentioned, family accommodation serves to maintain OCD symptoms because it does not allow the child to naturally habituate to anxiety nor does it permit the child to learn that feared consequences (e.g., contraction of an illness) typically do not occur. An additional consequence of family accommodation is the negative impact it has on family functioning, as studies have shown that family involvement in rituals results in added tension and frustration within family relationships (Waters & Barrett, 2000).

Etiology

Biological factors

A host of biological factors have been indicated as possible etiological contributors to the development of OCD (Micallef & Blin, 2001). Twin studies have highlighted the heritability of OCD symptoms, with a recent review of twin studies suggesting that the range of genetic influences is between 45 and 65 percent (Van Grootheest, Cath, Beekman, & Boomsma, 2005). Additionally, family studies have provided support for the role of genetic factors in OCD, with research indicating a greater rate of the disorder among first-degree relatives of patients with OCD (Nestadt et al., 2000; Rasmussen, 1993). Research has also implicated the role of neurochemical factors in the development of OCD. In particular, pharmacological trials revealing the benefits of serotonergic medications in OCD symptom reduction have suggested that the dysregulation of serotonin in the brain may be influential in the etiology of OCD (Abramowitz, Whiteside, & Deacon, 2005; Fineberg & Gale, 2005; Geller et al., 2004; Liebowitz et al., 2002; Riddle et al., 2001;). Additionally, researchers have begun to investigate the role of the dopaminergic system in the development of OCD, citing evidence of the benefits of augmenting serotonergic medications with dopaminergic agents in treatment-refractory patients (Denys, Zohar, & Westenberg, 2004). Brain-imaging research has identified several neuroanatomical etiological models of OCD, with studies highlighting structural and/or metabolic differences in the dorsolateral-caudate-striatum-thalamus circuitry (i.e., executive dysfunction model) as well as in the orbitofrontal-medial-cingulate circuitry (i.e., modulatory control model) among individuals with and without OCD (Friedlander & Desrocher, 2006). Finally, research has suggested the influence of neuroimmunological factors in the development of OCD. In particular, studies have highlighted a link between pediatric OCD and group A beta-hemolytic streptococcal infections (GABHS; see Larson, Storch, & Murphy, 2005 for a review). Specifically, research has indicated that misdirected autoimmune responses resulting from GABHS lead to basal ganglia dysfunction, which in turn, results in the manifestation of a range of impulsive reactions, including obsessive-compulsive symptoms, tics, and hyperactivity (Larson et al., 2005; Snider & Swedo, 2004). This condition is now referred to as pediatric autoimmune neuropsychiatric disorder associated with streptococcal infections (PANDAS) (AACAP, 1998).

Cognitive-behavioral factors

The cognitive-behavioral model of OCD highlights the roles of distorted cognitive appraisals and behavioral conditioning in the etiology and maintenance of symptoms (Turner, 2006). Within this model, obsessions are theorized to be a result of cognitive errors in the interpretations of the meaningfulness of normal intrusive thoughts (Salkovskis, 1985). Such errors include inflation of responsibility, over-importance of thoughts, excessive need to control thoughts, overestimation of risk, intolerance of uncertainty, and perfectionistic beliefs (OCCWG, 1997). Salkovskis (1999) described a worsening spiral of cognitive and behavioral responses characteristic of patients with OCD, which entails (1) selective attention to intrusive thoughts, resulting in (2) increased accessibility of intrusive thoughts, which leads to (3) increased anxiety and discomfort associated with intrusive thoughts, which in turn, results in (4) counterproductive attempts aimed at decreasing anxiety. Over time, these attempts, which include both compulsive rituals as well as avoidance behaviors, increase in frequency, as individuals learn via negative reinforcement that these attempts result in a reduction in anxiety (Albano, March, & Piacentini, 1999; Storch, 2005). This reduction in anxiety is only temporary, however. In fact, compulsions and avoidance paradoxically serve to increase the frequency of intrusive thoughts and cognitive biases, such that patients with OCD become trapped in a relentless cycle of obsessions and compulsions as well as accompanying distress (Salkovskis, 1999).

Assessment

A comprehensive multi-method and multi-informant assessment of obsessive-compulsive symptoms is recommended for an accurate diagnosis in youth, especially given the low levels of insight among some children and adolescents with OCD, as well as their tendency to be secretive about their symptoms (AACAP, 1998; Lewin, Storch, Adkins, Murphy, & Geffken, 2005). Evidence-based approaches to OCD assessment in youth include diagnostic interviews, clinician administered measures, and self-report and parent-report questionnaires (see Merlo, Storch, Murphy, & Geffken, 2005 for a review). Critical information to be obtained from an assessment includes (1) identification of specific symptoms and their degree of severity, (2) the context, frequency, and degree of associated distress and functional impairment, (3) the frequency in which the child attempts to resist the obsessions and compulsions and the outcome of these attempts, and (4) the child's attitude and level of insight into the symptoms (AACAP, 1998).

Diagnostic interviews are clinician-administered measures that assess for specific diagnostic criteria found in the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision* (DSM-IV-TR; APA, 2000). Although reliable and valid, as well as comprehensive (i.e., also assess for potential comorbid disorders), diagnostic interviews are often time consuming and expensive. The Anxiety Disorders Interview Schedule for DSM-IV: Child and Parent Versions (ADIS-

IV-C/P; Silverman & Albano, 1996) and the Schedule for Affective Disorders and Schizophrenia for School-Age Children - Present and Lifetime Version (K-SADS-PL; Kaufman, Birmaher, Brent, & Rao, 1997) are the two most common diagnostic interviews for youth with OCD.

Once a diagnosis has been made, it is important to establish current symptom severity, which entails an assessment of the amount of time consumed by obsessive-compulsive symptoms, the degree of distress associated with symptoms, and the extent to which obsessive-compulsive symptoms interfere with important domains of functioning. The Children's Yale-Brown Obsessive Compulsive Scale (CY-BOCS; Scahill et al., 1997), a clinician-rated, semi-structured inventory, is the most widely used measure of symptom severity. The CY-BOCS includes a symptom checklist for obsessions and compulsions as well as severity scales for obsessions, with parallel items for compulsions. The reliability and validity for the measure are well established, (Scahill et al., 1997; Storch et al., 2004) and administration time is between 15-30 minutes.

Self-report or parent-report questionnaires can be used to obtain additional information regarding the specific nature of OCD symptoms or OCD-related problems. Easy to administer and time-efficient, these measures often serve as useful screening devices. Among the most widely used questionnaires for the assessment of OCD in youth include the Leyton Obsessional Inventory - Child Version (LOI-CV; Berg, Rapoport, & Flament, 1986), the Children's Obsessional Compulsive Inventory (ChOCI; Shafran, Framptom, Heyman, Reynolds, Teachman, & Rachman, 2003), the Children's Yale-Brown Obsessive-Compulsive Scale-Child Report and Parent Report (Storch et al., 2006), the Child OCD Impact Scale (COIS; Piacentini & Jaffer, 1999), and the Family Accommodation Scale (Calvacoressi et al., 1995).

Treatment

There exist two evidence-based treatments for OCD in youth: Cognitive-Behavioral Therapy (CBT) with Exposure and Response Prevention (E/RP) and pharmacotherapy (serotonin reuptake inhibitors [SRIs] and selective serotonin reuptake inhibitors [SSRIs]). Findings from four randomized, controlled trials (RCTs) comparing CBT, pharmacological treatment, and placebo/waitlist conditions have established strong support for the efficacy of CBT, pharmacological treatment, and their combination (Barrett et al., 2004; de Haan, Hoogduin, Buitelaar, & Keijsers, 1998; POTS, 2004, Storch, Geffken et al., 2007e). In a recent meta-analysis of the effectiveness of treatments for pediatric OCD, findings indicated that both CBT and SSRIs are effective treatments for OCD (Abramowitz, Whiteside, & Deacon, 2005). Furthermore, results revealed that CBT was associated with greater clinically significant improvement in OCD symptoms when compared to SSRIs, suggesting the relative superiority of CBT to pharmacological treatment. Other advantages of CBT over SSRIs include durability of treatment gains (Barrett et al., 2005) and a lack of significant side effects from pharmacological treatment (Hammerness, Vivas, & Geller, 2006). Findings from research examining the effectiveness of CBT and SSRIs

suggest that CBT, delivered alone or in combination with SSRIs, should be the first-line treatment of pediatric OCD (POTS, 2004).

Cognitive-behavioral therapy

Based on the cognitive-behavioral etiological model of OCD, CBT targets both the behavioral (learned fear responses, avoidance) and cognitive (erroneous beliefs) symptoms of the disorder. The four major components of treatment include: consists of four components: psychoeducation, cognitive training, mapping of OCD, and exposure with response prevention (E/RP) (AACAP, 1998; March & Mulle, 1998). Lasting approximately 14 sessions, CBT can be delivered in either a weekly (POTS, 2004) or daily (Lewin et al., 2005; Storch et al., 2007e) format. The psychoeducational component of CBT includes a discussion of cognitive-behavioral etiological model of OCD to provide an understandable rationale for treatment. Additionally, the CBT clinician provides an orientation to treatment and answers any questions that the patient and his/her parents as may have regarding the nature of the child's symptoms. If relevant, the CBT clinician may also highlight the influence of family accommodation in the maintenance of symptoms and ways in which this will be addressed during treatment.

Cognitive training targets cognitive biases and erroneous beliefs in OCD patients. To facilitate the correction of these distortions, youth are first taught to identify and distinguish obsessive thoughts from his/her own rational thoughts (i.e., "externalize OCD"), and are then instructed in ways to cognitively restructure misinterpretations of harm or threat (March & Mulle, 1998; Piacentini & Langley, 2004). For example, a child with contamination fears is taught to examine the validity of the thought "I will get cancer from sitting in a doctor's waiting room" by gathering evidence for and against the thought (e.g., analyzing what has happened in the past, examining the likelihood of this occurrence). In addition to cognitive restructuring, patients are encouraged to engage in constructive self-talk (e.g., "I can beat OCD!") to facilitate motivation for treatment and their sense of self-efficacy. Cognitive strategies are adapted to the patient's developmental level and level of insight, with younger children typically benefiting more from constructive self-talk and older children benefiting from identifying and challenging distorted thoughts.

Mapping of OCD entails creating a fear hierarchy to be used for E/RP. The hierarchy includes a list of specific anxiety-provoking situations that are rank-ordered by the patient's rating of how much distress each situation causes (Wolpe, 1969). Exposure with response prevention involves exposing the patient to anxiety-provoking stimuli while having him/her refrain from engaging in anxiety-reducing rituals. Patients begin with the least anxiety-provoking stimuli and gradually move up their hierarchy upon mastery of lower-ranked stimuli (i.e., show minimal distress with exposure and response prevention exercise). For example, a patient with ordering obsessions and straightening compulsions might begin by cluttering her desk with school supplies without organizing them, and then might move on to throwing toys and clothes all over her room while refraining from tidying up. Through E/RP, the

patient learns to habituate to anxiety without engaging in compulsions, and also acquires new information about feared situations that facilitates a more realistic appraisal regarding beliefs about harm and responsibility (Foa & Kozak, 1986).

Involving parents in CBT is a crucial aspect of successful treatment for several reasons (Barrett, Healy-Farrell, & March, 2004; Storch et al., 2007e). Including parents in the psychoeducational component of treatment permits an increased understanding of their child's symptoms, which is thought to decrease critical remarks made toward the child (March & Mulle, 1998). Additionally, psychoeducation about family accommodation serves to assist the family in reducing the extent to which they reinforce their child's symptoms through modifying family schedules or participating directly in rituals (Freeman et al., 2003). Active parental participation also facilitates generalization of treatment principles to settings outside of the clinician's office, as parents are encouraged to take on the role of the therapist or "coach" during home exposures (March, Franklin, Nelson, & Foa, 2001). Parents are encouraged to utilize positive reinforcement techniques (e.g., verbal praise, tangible incentive) to provide support during difficult exposures and to strengthen treatment compliance.

Pharmacotherapy

The research literature strongly supports the efficacy of SSRIs, including fluoxetine, fluvoxamine, paroxetine, and sertraline, in the treatment of pediatric OCD (Cook et al., 2001; Geller et al., 2003; Geller et al., 2001; Liebowitz et al., 2002; POTS, 2004; Reinblatt & Riddle, 2007; Riddle et al., 2001). In a recent meta-analysis of randomized controlled trials (RCTs) of SSRIs, results revealed that the pooled effect size was .46, indicating a moderate effect, and serotonergic medications were found to be significantly superior to placebo conditions (Geller et al., 2003). However, it should be noted that effect sizes from individual RCTs varied considerably, with most studies reporting small to moderate effects. A recent review of the literature highlighted the dearth of studies examining the relative efficacy of SSRIs, noting that there has been no RCT directly comparing specific SSRIs (Reinblatt & Riddle, 2007). Findings from the meta-analysis suggested no significant differences between specific SSRIs (Geller et al., 2003), and currently, it is recommended that serotonergic medications be selected based on side effect profiles and individual pharmacokinetic properties (Hammerness et al., 2006).

Although SSRIs are generally well tolerated by patients (Williams & Miller, 2003), side effects of the medication include gastrointestinal problems (e.g., abdominal pain, diarrhea), headaches, insomnia, and activation syndrome (Hammerness et al., 2006). Symptoms of activation syndrome include irritability, somatic manifestations of anxiety, restlessness, aggressiveness, disinhibition, emotional lability, impulsivity, hypomania/mania, and social withdrawal (Goodman, Murphy, & Storch, 2007). Given reports of increased risk of suicidality among pediatric patients taking SSRIs (Goodman et al., 2007; Hammad, Laughren, & Racoosin, 2006), the FDA Advisory Committee has recommended that a black box warning regarding the

risk of suicidality for all antidepressants in pediatric patients be included as part of the product labeling (US Food and Drug Administration, 2007). However, it should be noted that few firm conclusions can be drawn regarding the safety of antidepressants in the pediatric population, as researchers have highlighted the paucity of longitudinal studies examining the long-term outcomes associated with antidepressant use in youth (Leckman & King, 2007).

Future directions

Despite considerable advancement in the field's understanding of pediatric OCD in the past several decades, there continues to be considerable gaps in the literature. One area deserving more research attention pertains to the investigation of OCD in early childhood (ages 5 to 8 years), given that research suggests that earlier onset of symptoms is related to more persistent OCD symptoms (Stewart et al., 2004). The developmental, social, and academic milestones occurring during early childhood are numerous, and they have an influential and long-lasting effect on later functioning. Suffering from a severe and impairing diagnosis like OCD during this time period is likely to have a dramatic impact on normal development. Despite these concerns, the current literature has largely neglected this age group, and therefore, little is known regarding the effectiveness of interventions with this population (e.g., what modifications are needed to facilitate the identification of obsessions and mental rituals in young children?). Research on the treatment of young children with OCD is greatly needed, as it will guide the development of early and targeted interventions that may prevent the condition from taking its debilitating course (Freeman et al., 2007). Furthermore, gathering longitudinal data regarding the developmental trajectories of young children with OCD may have a significant impact on the field's understanding of the disorder's course as well as potential predictors of symptom improvement and/or exacerbation.

Another area worthy of future research pertains to the impact of comorbidity on treatment for pediatric OCD. Although the current literature has highlighted the high rates of comorbidity among children with OCD (e.g., POTS, 2004), little attention has been paid to understanding how specific comorbid disorders may negatively affect treatment response. One study examining CBT response in children with and without comorbid disorders found that youth with non-anxiety comorbid disorders (i.e., attention-deficit hyperactivity disorder, oppositional defiant disorder, major depressive disorder, dysthymic disorder, trichotillomania) had the poorest treatment response, suggesting that certain disorders may be particularly detrimental to treatment outcome (Storch et al., *in press*). Anecdotally, clinicians have highlighted the negative impact of oppositionality on treatment compliance, and they have also implicated depressed mood and associated low motivation levels as a predictors of poor treatment response. Although the adult literature has identified several specific comorbid disorders as risk factors for poor treatment outcome (Keeley, Storch, Merlo, & Geffken, 2008), the child literature

has significantly lagged behind. However, a recent study examining the impact of comorbidity in the cognitive-behavioral treatment of pediatric OCD found that youth with one or more comorbid conditions evidenced lower treatment response and remission rates compared to those without a comorbid condition (Storch et al., 2008). Specifically, findings revealed that the presence of attention deficit hyperactivity disorder and disruptive behavior disorders were related to lower treatment response rates, and the presence of disruptive behavior disorders and major depressive disorder were related to lower remission rates (Storch et al., 2008). Results suggest the need to incorporate adjunctive interventions (e.g., parent management training, cognitive training specific to depressive distortions) into the treatment of pediatric OCD for those youth suffering from comorbid diagnoses in order to reduce the detrimental effects of comorbid symptoms on treatment response.

Another area worthy of future research pertains to the investigation of augmentative agents for youth who do not fully respond to SSRIs despite receiving optimal doses. Numerous augmentative agents have been examined (e.g., lithium, clonidine, haloperidol), but results have largely been unfavorable, with most studies suggesting that these agents yield partial or no meaningful effects (Jenike, 2001). Future studies should explore additional augmentative agents such as atypical antipsychotics, as preliminary findings from case and open label studies provide support for the efficacy of these medications (Degner, Bleich, Kornhuber, Rutter, 2000; Fitzgerald, Stewart, Tawile, & Rosenberg, 1999; Kawahara, Ueda, & Mitsuyama, 2000). Furthermore, future controlled studies should examine the potential benefit of combined medication strategies in pediatric OCD.

Finally, there have been very few investigations of the long-term outcomes of CBT for pediatric OCD. One study of individual and group CBT highlighted the long-term effects of treatment, with a total of 78% of participants in the study being diagnosis-free at 12-month follow-up (Barrett, Farrell, Dadds, & Boulter, 2005). Despite these promising results, not all youth maintain treatment gains. Anecdotally, many children and adolescents experience "flare-ups" of OCD symptoms during periods of significant stress and/or change, and other youth have difficulty following through with home-based exposures without ongoing therapist guidance and support. For these reasons, it will be valuable to investigate the effects of relapse prevention interventions on long-term outcomes of youth with OCD. Also deserving research attention are studies analyzing the effects of "booster" sessions on the long-term maintenance of treatment gains. The field has begun investigating the utility of computer- and telephone-administered CBT for adults (Lovell et al., 2006; Tumur, Kaltenthaler, Ferriter, Beverley, & Parry, 2007), and these modalities may have particular value in providing ways to access follow-up care for children and adolescents.

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