Family-Based Cognitive-Behavioral Therapy for Pediatric Obsessive-Compulsive Disorder: Comparison of Intensive and Weekly Approaches

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ABSTRACT

Objective: To examine the relative efficacy of intensive versus weekly cognitive-behavioral therapy (CBT) for children and adolescents with obsessive-compulsive disorder (OCD). **Method:** Forty children and adolescents with OCD (range 7–17 years) were randomized to receive 14 sessions of weekly or intensive (daily psychotherapy sessions) family-based CBT. Assessments were conducted at three time points: pretreatment, posttreatment, and 3-month follow-up. Raters were initially blind to randomization. Primary outcomes included scores on the Children's Yale-Brown Obsessive-Compulsive Scale, remission status, and ratings on the Clinical Global Impression-Severity and Clinical Global Improvement scales. Secondary outcomes included the Child Obsessive Compulsive Impact Scale-Parent Rated, Children's Depression Inventory, Multidimensional Anxiety Scale for Children, and Family Accommodation Scale. Adjunctive pharmacotherapy was not an exclusion criterion. **Results:** Intensive CBT was as effective as weekly treatment with some advantages present immediately after treatment. No group differences were found at follow-up, with gains being largely maintained over time. Although no group × time interaction was found for the Children's Yale-Brown Obsessive-Compulsive Scale ($F_{1,38} = 2.2$, $p = .15$), the intensive group was rated on the Clinical Global Impression-Severity as less ill relative to the weekly group ($F_{1,38} = 9.4$, $p < .005$). At posttreatment, 75% (15/20) of youths in the intensive group and 50% (10/20) in the weekly group met remission status criteria. Ninety percent (18/20) of youths in the intensive group and 65% (13/20) in the weekly group were considered treatment responders on the Clinical Global Improvement ($\chi^2_1 = 3.6$, $p = .06$). **Conclusions:** Both intensive and weekly CBT are efficacious treatments for pediatric OCD. Intensive treatment may have slight immediate advantages over weekly CBT, although both modalities have similar outcomes at 3-month follow-up. *J. Am. Acad. Child Adolesc. Psychiatry,* 2007;46(4):469–478. **Key Words:** obsessive-compulsive disorder, cognitive-behavioral therapy, treatment, intensive.

Obsessive-compulsive disorder (OCD) is a relatively common childhood psychiatric condition with prevalence rates between 1% and 4% (Zohar, 1999). Pediatric OCD is often accompanied by significant psychosocial impairment (Piacentini et al., 2003) and, if untreated, may run a chronic course (Rufer et al., 2005). Two treatments have demonstrated efficacy, namely, pharmacotherapy with serotonin reuptake inhibitors (SRIs) and cognitive-behavioral therapy (CBT) with exposure and response prevention (see Abramowitz et al., 2005 for a review). Effect sizes from controlled CBT trials are large, paralleling or exceeding those of SRIs ($mean_{effect\ size\ CBT} = 1.98$ versus $mean_{effect\ size\ SRI} = 1.13$; Abramowitz et al., 2005), leading to the recommendation that CBT alone

or with concurrent pharmacotherapy should be the first-line treatment for pediatric OCD (Pediatric Obsessive-Compulsive Disorder Treatment Study Team, 2004).

Overall, CBT is an effective intervention with some advantages over medication on the side of both efficacy and safety. Furthermore, CBT appears to have more enduring effects following conclusion of treatment relative to medication (e.g., Barrett et al., 2005). Despite these advantages, a primary limitation remains access to trained practitioners. Much of the research on CBT has been conducted at specialized academic centers, not in routine clinical settings, so transportability remains an unresolved question. Patient access to treatment is limited by the availability of trained therapists, with the majority of OCD patients receiving no treatment, medication alone, and/or non-CBT psychotherapy (Goodwin et al., 2002).

Given these factors, alternative, empirically supported treatment models are needed to facilitate treatment access. One such model with support in adults (e.g., Abramowitz et al., 2003; Foa et al., 2005) is intensive CBT. Although there are variations in the delivery of intensive CBT (e.g., inpatient versus outpatient; 90-minute sessions versus several-hour sessions), our definition of intensive therapy includes 90-minute psychotherapy sessions held 5 days/week for 3 weeks. Intensive CBT may remove access barriers by allowing families to temporarily relocate to a site where they can receive treatment in a pediatric OCD specialty setting. There are a number of other potential benefits, which may include reducing functional impairment in a more rapid manner than standard approaches, providing an alternative for patients who have severe symptoms or are treatment resistant (Storch et al., in press), and enhancing family motivation by allowing therapy to be the primary focus for several weeks (Foa and Steketee, 1987). On balance, intensive treatment introduces several unique barriers such as removing the child from school, obtaining leave from the parent's workplace, and cost of temporarily relocating.

Although three randomized clinical CBT trials for pediatric OCD have been published (Barrett et al., 2004; de Haan et al., 1998; Pediatric Obsessive-Compulsive Disorder Treatment Study Team, 2004), to date only two open trials and two case reports of intensive treatment for pediatric OCD have been reported. Storch et al. (2006) found that six of seven children (ages 9–13) with OCD of the pediatric

autoimmune neuropsychiatric disorders associated with *Streptococcus* (PANDAS) subtype were responders to 3-week intensive CBT. PANDAS refers to a subset of children who present with symptoms of OCD and/or tic disorders as an immune response to a group A (β-hemolytic) streptococcal infection. Symptoms of PANDAS include an abrupt onset following a group A (β-hemolytic) streptococcal infection, a relapsing-remitting course of illness, and include any of a wide range of psychiatric symptoms (e.g., motor or vocal tics, obsessions, compulsions, irritability, sudden mood changes, separation anxiety; see Larson et al., 2005 for a review). Scores on the Children's Yale-Brown Obsessive-Compulsive Scale (CY-BOCS; Scahill et al., 1997) decreased significantly following intervention (Cohen's $d = 3.38$) and three of six remained responders at follow-up. Franklin et al. (1998) reported a 70% average reduction in CY-BOCS total score in seven youths (10–17 years old) who were treated daily for 1 month. Franklin et al. (2001) describe a 12-year-old boy with severe OCD who was seen 5 days/week for a total of 11 sessions. Results indicated marked improvements in clinician-rated OCD symptoms and self-reported depressive symptoms. Storch et al. (2004a) showed marked and sustained CY-BOCS reductions after intensively treating a 6-year-old boy with rapid-onset pediatric OCD of the PANDAS subtype.

Although these results are promising, a randomized clinical trial has yet to be conducted comparing intensive CBT to standard weekly treatment. Given the need to document the efficacy of intensive CBT relative to the current standard of psychological care, as well as the potential for intensive CBT to facilitate rapid improvements, we report a randomized trial to examine potential differences between intensive CBT (14 daily sessions over 3 weeks) and weekly CBT (14 weekly sessions). We expected significant reductions in both groups on measures of symptom severity, functional impairment, and child-reported anxiety and depression.

METHOD

Participants

Forty children (22 female) between the ages of 7 and 17 (mean 13.3 ± 2.7) participated in this study after completing human subjects informed consent processes approved by the University of Florida Institutional Review Board. Inclusion criteria were principal diagnosis of OCD and CY-BOCS total score ≥16, no change in psychotropic medication (if applicable) for at least 8 weeks before

study entry, 7 to 17 years old, and availability of at least one parent to accompany the child to all sessions. Children were excluded if they met any of the following criteria: history of and/or current psychosis, pervasive developmental disorder, bipolar disorder, or current suicidality measured by the Anxiety Disorder Interview Schedule for DSM-IV-Child Interview Schedule-Parent version (ADIS-IV-P) and all available clinical information; principal diagnosis other than OCD; a positive diagnosis in the caregiver of mental retardation, psychosis, or other psychiatric disorders or conditions that would limit their ability to understand CBT (based on clinical interview). Participants were not excluded because of comorbid psychiatric diagnoses.

Participants were recruited from families who presented to the University of Florida OCD Program for treatment. During the initial evaluation, families who met study criteria were asked if they would like to hear about a study evaluating CBT for pediatric OCD. Fifty families were screened, of which eight did not meet inclusion/exclusion criteria (Fig. 1). Of the 42 eligible families, only 2 families declined participation because they did not wish to be randomized.

All of the participants had a principal diagnosis of OCD, according to *DSM-IV-TR* criteria, made by a clinical child psychologist or board-certified child psychiatrist, based on clinical interview. Diagnoses were verified through administration of the ADIS-IV-P (Silverman and Albano, 1996) and CY-BOCS by a trained independent evaluator. Determination of the principal diagnosis was based on current symptom severity and impairment. Baseline demographic and clinical characteristics are included in Table 1. Sixty percent of children (*n* = 24) were receiving medication for OCD at the time of the study.

Measures

ADIS-IV-P. The ADIS-IV-P (Silverman and Albano, 1996) is a clinician-administered, structured interview that was developed from *DSM-IV* diagnostic criteria. The ADIS-IV-P focuses primarily on anxiety disorders, but also screens for related disorders (i.e., disruptive behavior disorders, psychotic disorders, and eating disorders). Diagnoses are based on symptom endorsement as well as obtaining a distress/impairment severity rating of ≥4 (on a scale of 0–8). The ADIS-IV-P has demonstrated excellent psychometric properties (Silverman et al., 2001).

CY-BOCS. The CY-BOCS (Scahill et al., 1997) is a clinician-rated, semistructured measure of OCD severity rated over the previous week. The CY-BOCS consists of 10 items rated on a 5-point Likert scale. The CY-BOCS yields an Obsession Severity score (five items)
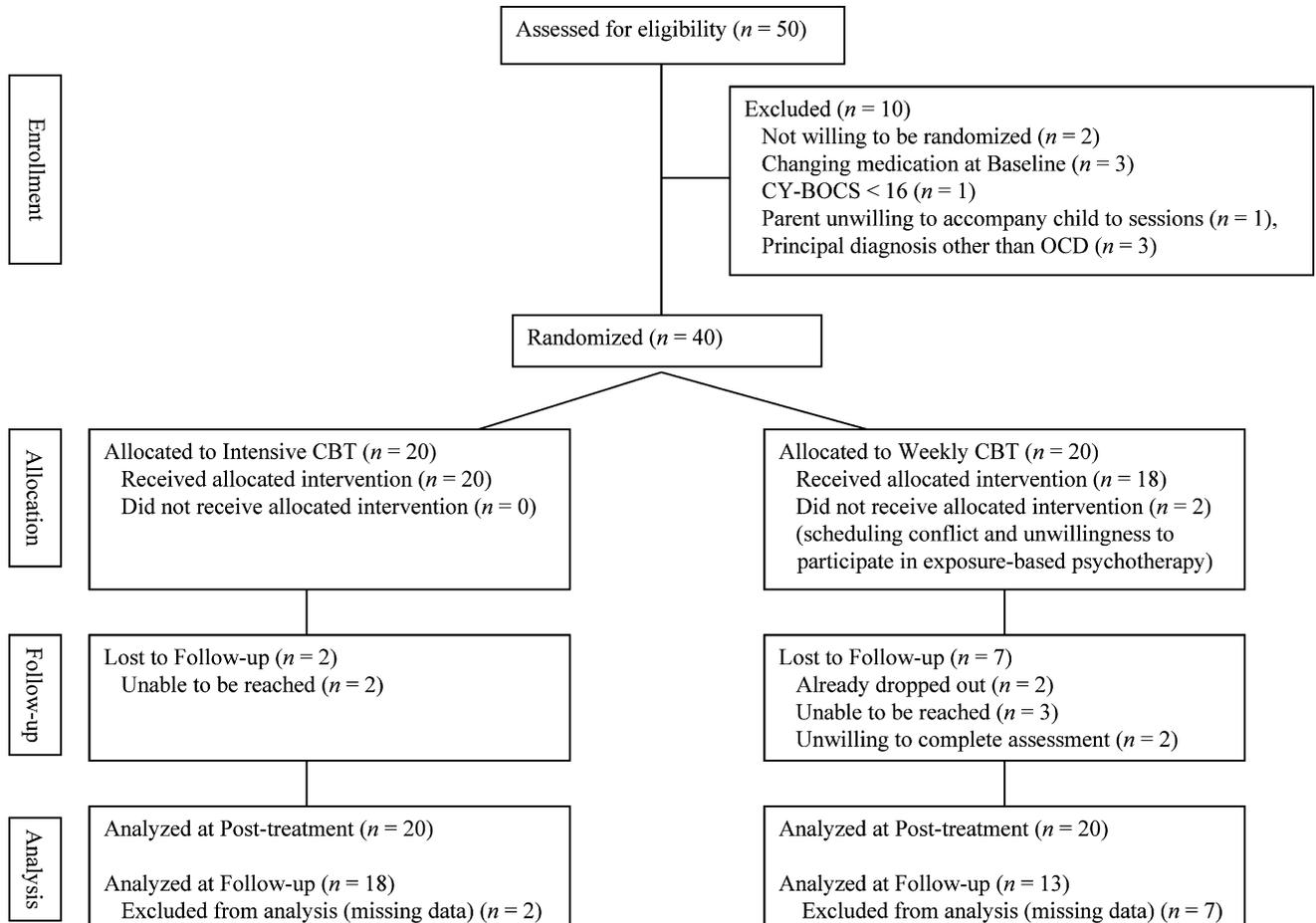

Fig. 1 Study flowchart. CY-BOCS = Children's Yale-Brown Obsessive-Compulsive Scale; OCD = obsessive-compulsive disorder; CBT = cognitive-behavioral therapy.

TABLE 1
Baseline Demographic and Clinical Characteristics

Characteristics	Total Sample	Intensive	Weekly
Gender	18 male	10 male	8 male
Ethnicity	37 white, 3 Hispanic	18 white, 2 Hispanic	19 white, 1 Hispanic
Age, y (mean ± SD)	13.3 ± 2.7	12.0 ± 2.1	14.5 ± 2.8
Family income, mean ± SD	$96,055 ± 49,855	$85,588 ± 33,160	$105,421 ± 60,493
Treatment history (lifetime)[a]			
Medication alone	9	6	3
Psychotherapy alone	2	1	1
Medication and psychotherapy	18	9	9
Psychiatric comorbidity			
Generalized anxiety disorder	11	6	5
Tourette's disorder or tics	5	3	2
Major depression	7	3	4
Attention-deficit/ hyperactivity disorder	12	6	6
Oppositional defiant disorder	7	4	3
Social phobia	5	1	4
Asperger's disorder	3	1	2
Panic disorder	2	1	1
Trichotillomania	1	1	0
Agoraphobia without panic disorder	1	1	0
No comorbid diagnosis	11	5	6

[a] At the baseline assessment, 24 children (13 in intensive) were taking psychotropic medication(s) for their obsessive-compulsive disorder.

and a Compulsion Severity score (five items) as well as the total score. The CY-BOCS was administered to both the child and parent(s) jointly, given that many youths underestimate their symptoms. The CY-BOCS has shown excellent internal consistency (α = .87–.90; Scahill et al., 1997; Storch et al., 2004b), good to excellent interrater agreement (intraclass correlations [ICCs] 0.66–0.91) (Scahill et al., 1997), and good 6-week stability (ICC 0.79) (Storch et al., 2004b). The CY-BOCS has treatment sensitivity (e.g., Pediatric Obsessive-Compulsive Disorder Treatment Study Team, 2004), and convergent and discriminant validity (Scahill et al., 1997; Storch et al., 2004b). A score of 8 to 15 corresponds to mild symptoms, whereas scores of 16 to 23, 24 to 31, and 32 to 40 correspond to moderate, severe, and extreme symptoms, respectively (Goodman et al., 1989).

Clinical Global Impressions-Severity. The Clinical Global Impressions-Severity (CGI-S) scale (National Institute of Mental Health, 1985) is a clinician rating of symptom severity. Ratings range from 0 (no illness) to 6 (extremely severe). In previous research with pediatric patients with OCD (Storch et al., 2004b), the CGI-S demonstrated strong correlations with the CY-BOCS total score (r = 0.75). The CGI-S is widely used and treatment sensitive (e.g., Pediatric Obsessive-Compulsive Disorder Treatment Study Team, 2004).

Clinical Global Impressions-Improvement. The Clinical Global Impressions-Improvement (CGI-I; Guy, 1976) is a clinician-rated measure of treatment response. Response options fall along a 7-point scale ranging from 1 (very much improved) to 7 (very much worse). For the present study, youths obtaining a score indicating very much improved or much improved were defined a priori as treatment responders.

Child Obsessive Compulsive Impact Scale-Parent Rated. The Child Obsessive Compulsive Impact Scale-Parent Rated (COIS-P; Piacentini et al., 2003) is a 56-item parent-rated questionnaire that examines OCD-related impairment in specific areas of child psychosocial functioning. The COIS-P assesses difficulties in school activities (16 items), social activities (19 items), and home/family activities (17 items). Parents rate OCD interference for each area of functioning using a 4-point scale ranging from not at all to very much. Four global questions assess overall impairment in school, social activities, going places, and home/family activities. The COIS-P has demonstrated good internal consistency and construct validity (Piacentini et al., 2003).

Children's Depression Inventory. The Children's Depression Inventory (CDI; Kovacs, 1992) is a 27-item self-report measure of depressive symptoms. Respondents choose one sentence from a group of three that best describes them during the past 2 weeks. Items are rated 0 to 2, depending on the severity of their response. The CDI has demonstrated strong psychometric properties (Kovacs, 1992).

Multidimensional Anxiety Scale for Children. The Multidimensional Anxiety Scale for Children (MASC; March et al., 1997) is a 39-item, self-report measure of anxiety symptoms in children. It is composed of four basic subscales: Physical Symptoms, Harm Avoidance, Social Anxiety, and Separation/Panic, as well as an Inconsistency Index, which helps to identify random/careless response behaviors. Items are rated on a 4-point scale and summed to derive a total score. Only the total score was analyzed for this study. The MASC has demonstrated good psychometric properties (March et al., 1997, 1999).

Family Accommodation Scale. The Family Accommodation Scale (FAS; Calvocoressi et al., 1995) is a 13-item parent-report questionnaire scored on a 5-point Likert-type scale that assesses the degree to which family members have accommodated the child's OCD symptoms during the previous month (9 items) and the level of distress/impairment that the family members and patient experience as a result of the family accommodating or not accommodating the child (4 items). The FAS has demonstrated good psychometric properties, including adequate internal consistency, and positive correlations with symptom severity, family relationships, and caregiver distress (Calvocoressi et al., 1995).

Procedures

Assessments. After obtaining appropriate written consent and assent, participants were randomly assigned to receive CBT administered in either intensive or weekly format. At pretreatment, posttreatment, and 3-month follow-up assessments, research assistants (master's degree–level or doctoral-level graduate students in clinical psychology who were blinded to treatment condition at

pretreatment) administered the ADIS-IV-P, CY-BOCS, and CGI-I to parents and children jointly, and the FAS to parents alone. Ratings for the former were based on both parent and child responses, as well as clinician judgment and behavioral observation of the child. At each assessment, a licensed psychologist (G.R.G.) not involved in participants' treatment confirmed diagnoses. Confirmation was based on a review of all of the available information and discussion with the assessor. Following administration of clinician-rated measures, instructions were given on completing the self-report questionnaires. Parents completed the COIS-P, and youths completed the CDI and MASC. Participants were assessed at baseline, posttreatment, and at 3-month follow-up. Children were allowed up to four CBT booster sessions during the follow-up period, depending on their needs. Psychotropic medications remained stable throughout the study.

All of the research assistants underwent extensive training with the first author in the administration of these measures, which included attending an instructional meeting, observing three administrations of the measures, and administering the measures three times with in vivo observation and supervision. The first author readministered the CY-BOCS to 20 children and their parents at pretreatment to evaluate interrater reliability; κ was 0.96 for the CY-BOCS total score.

Treatment

Intensive CBT. Participants randomized to the intensive CBT condition received individual CBT sessions each weekday for 3 weeks (total of 14 sessions). Sessions lasted 90 minutes and were conducted according to the Lewin et al. (2005) treatment manual. The manual was adapted for intensive intervention from the CBT protocol used in Pediatric Obsessive-Compulsive Disorder Treatment Study Team (2004) and includes psychoeducation, cognitive training, and exposure with response prevention. One notable difference is that sessions are delivered in a "family-based" format, with at least one parent attending all sessions with the patient. Based on work by Freeman et al. (2003), parents are included in treatment to facilitate understanding of treatment principles, to assist with generalization of treatment gains by enlisting the parent as an at-home "coach," to reduce parent accommodation of OCD symptoms, and to encourage optimal effort by the child during in-session exposures and homework assignments. Briefly, during sessions 1 through 3, the cognitive-behavioral model of OCD is reviewed and an exposure and response prevention hierarchy created ranking situations from least to most distressing on the Subjective Units of Distress Scale. In session 4, the child selects a trial exposure of relative ease. Thereafter, CBT sessions consist of gradual exposure (both imaginal and in vivo) to hierarchy items, with instructions for strict abstinence from compulsions. Early exposures are to moderately distressing situations with progression toward more anxiety-provoking ones. Consistent with best practices recommendations, the majority of time in session was spent in exposure-related activities. During exposures, therapists directed attention to youths' mistaken cognitions about the likelihood of catastrophic consequences. Between-session homework was assigned (≥60 minutes daily) consisting of exposures to stimuli similar to those addressed in session. Parts of the final two sessions were used to prepare the patient to manage symptoms independently. Potential barriers and problem situations were also reviewed accompanied by a discussion of the appropriate action.

As in the Pediatric Obsessive-Compulsive Disorder Treatment Study Team protocol, treatment plans were individually tailored to address patient-specific symptoms as well as other needs (e.g., family accommodation, oppositionality, parent–child communication problems, developmental needs). For younger children in both groups, fewer and less sophisticated cognitive components to treatment were included. In addition, younger children often required more parental involvement (e.g., reduce accommodation) and contingency management strategies (e.g., rewards for participation in exposure and response prevention exercises). Each participant's treatment was conducted by a team of three therapists (clinical child psychology postdoctoral fellows and/or doctoral candidates) under the first author's supervision, who distributed the 14 sessions between him or her. Therapists provided an average of two sessions per week and participated in daily supervision with the first or second author.

Weekly CBT. Participants randomized to the weekly CBT condition received 14 individual weekly CBT sessions. Sessions lasted 90 minutes and were conducted according to the Pediatric Obsessive-Compulsive Disorder Treatment Study Team (2004) protocol (see above description), with minor adaptations. The adaptations included delivering treatment sessions over a 14-week span (rather than the 12-week protocol described by the Pediatric Obsessive-Compulsive Disorder Treatment Study Team [2004]) and delivering the sessions in a family-based format as described above. Unlike the intensive treatment, therapy sessions were conducted by an individual therapist rather than therapy teams. The same therapists (clinical child psychology postdoctoral fellows and/or doctoral candidates) provided the treatment for both conditions, seeing approximately the same number of patients in each condition. For the weekly intervention, therapists received weekly supervision by the first or second author.

Data Analysis

Data were reviewed descriptively using frequency counts, means, and SDs. Mean item total or subscale scores were used to replace missing data for measures missing less than 15% of items. Distributions were reviewed to evaluate underlying statistical assumptions of the data. *t* Tests were performed to examine pretreatment differences on continuous data. Primary outcomes included scores on the CY-BOCS, remission status, and ratings on the CGI-S and CGI-I scales. Secondary outcomes included the COIS-P, CDI, MASC, and FAS.

Next, similar to Barrett et al. (2004), we examined time main effects and group × time interactions for pre-and posttreatment outcomes using 2 (group: intensive versus weekly) × 2 (time: pretreatment, posttreatment) repeated-measures mixed factorial analysis of variance. Given variation in sample size at follow-up, stability of treatment gains was assessed using 2 (group: intensive versus weekly) × 2 (time: posttreatment, follow-up) repeated-measures mixed factorial analyses of variance. Raw scores were used for continuous variables. Group comparisons of CGI-I ratings and remission status were performed using χ^2 analysis. Finally, 2 (group: CBT without medication versus CBT with concurrent medication) × 2 (time: pretreatment, posttreatment) repeated-measures factorial analyses of variance were conducted to examine the effects of combined CBT and medication on outcome across participants. Given limited power because of the modest sample size and use of two active treatment groups, no statistical correction was employed for type I error.

For the current study remission was classified as having a severity rating on the ADIS-IV-P ≤3 and CY-BOCS total score ≤10. To

further evaluate the clinical relevance of the findings, independent of sample size, the standardized difference between means was calculated as a measure of effect size for the pre- and posttreatment difference. The following formula was used for this analysis: Cohen's $d = mean_1 - mea_2/s_{pooled}$, where $s_{pooled} = \ddot{O}[(s_1^2 + s_2^2)/2]r_{Y1} = d/\ddot{O}(d^2 + 4$ (Cohen, 1988). All of the statistical procedures were performed using SPSS 13.0. Given the small sample size and that only two subjects dropped out of treatment, we used last-observation-carried-forward analyses to account for missing data at the posttreatment assessment. Analyses of follow-up data did not use last observation carried forward because of modest missing data and only included those who completed the follow-up assessment.

RESULTS

Twenty subjects were randomized to intensive treatment and 20 to weekly treatment. In total, 95% of the children completed the intervention with two subjects in the weekly condition dropping out at after sessions 4 and 5. Follow-up data were complete for 31 of 40 children (80%; intensive $n = 18$, weekly $n = 13$). Consistent with Tolin et al. (2004), the first author assigned a treatment fidelity rating on a 6-point scale (0 = poor fidelity, 5 = excellent fidelity) for each child's treatment based on a comparison to the manuals (mean 4.67, SD 0.52, range 3–5). No group differences in integrity existed. Fifteen patients received booster sessions (intensive, $n = 9$; weekly $n = 6$) following posttreatment (range 0–4, mean 1.2 ± 1.7). Table 2 shows descriptive statistics and effect sizes for outcomes for intensive and weekly treatment groups at each assessment point.

Preliminary Comparisons

Preliminary analysis revealed that the groups did not differ significantly on gender, medication status, past psychotherapy involvement, income, or parental marital status. Despite the inclusion of a blinded randomization procedure, however, a significant imbalance was noted between the intervention groups across the variables of age ($t(39) = -3.2$, $p < .01$) and CGI-S rating ($t(39) = -2.7$, $p < .01$). The mean age in the intensive treatment arm was 12.0 ± 2.1 years compared to 14.5 ± 2.8 years in the weekly arm. The mean CGI-S rating for the intensive group was 4.2 versus 3.5 for the weekly group. As these variables were not prespecified covariates, an adjusted analysis was not performed.

Primary Outcomes

CY-BOCS. A significant within-group main effect was identified for CY-BOCS change from pre- to posttreatment ($F_{1,38} = 136.1$, $p < .001$). No significant group × time interaction was found ($F_{1,38} = 2.2$, $p = .15$). At follow-up, there was no significant time main effect ($F_{1,29} = 0.3$, $p = .60$) or group × time interaction ($F_{1,29} = 0.7$, $p = .42$), suggesting that gains were maintained over time.

CGI-S. A significant within-group main effect was identified for the CGI-S rating from pre- to posttreatment ($F_{1,38} = 126.8$, $p < .001$). A significant group × time interaction was found ($F_{1,38} = 9.4$, $p < .005$) suggesting that the intensive condition was rated as being less ill relative to the weekly group (mean change

TABLE 2
Means, SDs, and Effect Sizes for Outcome Measures for Intensive and Weekly Treatment Groups

Scale	Baseline, Mean (SD)		Posttreatment, Mean (SD)			Follow-up, Mean (SD)			Posttreatment Effect Size[a]	Follow-up Effect Size[b]
	Intensive	Weekly	Intensive	Weekly	p	Intensive	Weekly	p	Intensive, Weekly	Intensive, Weekly
CY-BOCS	25.9 (5.6)	25.4 (5.8)	9.5 (6.9)	12.8 (8.8)	.151	10.2 (8.7)	9.8 (7.6)	.422	2.62, 1.73	2.20, 2.33
CGI-S	4.2 (0.8)	3.5 (0.8)	1.4 (0.9)	1.9 (1.1)	.004	1.4 (1.0)	1.3 (1.0)	.546	3.29, 1.68	3.11, 2.44
COIS-P	44.2 (25.9)	39.1 (29.8)	18.2 (14.2)	25.9 (28.8)	.075	9.9 (10.4)	23.5 (24.7)	.069	1.30, 0.45	1.89, 0.57
CDI	11.3 (8.9)	13.1 (6.2)	7.8 (9.0)	8.6 (6.2)	.606	6.5 (7.4)	8.7 (5.9)	.127	0.40, 0.74	0.60, 0.75
MASC	50.1 (18.4)	39.4 (14.6)	34.8 (17.3)	34.3 (13.1)	.063	33.1 (15.7)	32.6 (15.8)	.620	0.86, 0.37	1.00, 0.45
FAS	24.2 (10.0)	16.3 (10.4)	10.7 (9.1)	11.5 (8.2)	.036	13.0 (7.9)	13.7 (6.1)	.716	1.41, 0.52	1.24, 0.32

Note: Raw scores were used for all variables in this table. CY-BOCS = Children's Yale-Brown Obsessive-Compulsive Scale; CGI-S = Clinical Global Impressions-Severity; COIS-P = Child Obsessive Compulsive Impact Scale-Parent Rated; CDI = Children's Depression Inventory; MASC = Multidimensional Anxiety Scale for Children; FAS = Family Accommodation Scale.

[a] Based on pre- and posttreatment differences.
[b] Based on pre- and follow-up difference.

2.8 versus 1.6). At follow-up, there was no significant time main effect ($F_{1,29}$ = 0.1, p = .91) or group × time interaction ($F_{1,29}$ = 0.4, p = .55), suggesting that gains were maintained at follow-up.

CGI. Chi-square analysis revealed no group difference in CGI-I ratings at posttreatment (χ_1^2 = 3.6, p = .06). At posttreatment, 90% (18/20) of the children in the intensive group and 65% (13/20) in the weekly group were considered treatment responders on the CGI-I. There was no group difference at follow-up (χ_1^2 = 0.2, p = .66). Seventy-five percent (15/18) of those in the intensive group and 50% (10/13) in the weekly condition were classified as responders at follow-up.

Remission Status. Chi-square analysis revealed no group difference in remission status (i.e., no diagnosis on ADIS-IV-P and CY-BOCS total score ≤10) at posttreatment (χ_1^2 = 2.7, p = .10). At posttreatment, 75% (15/20) of the children in the intensive group and 50% (10/20) in the weekly group met remission status criteria. No statistical difference emerged at follow-up (χ_1^2 = 0.8, p = .77). Seventy-two percent (13/18) of those in the intensive group and 77% (10/13) in the weekly condition were without an OCD diagnosis at follow-up.

Secondary Outcomes

MASC. A significant within-group main effect was noted for the MASC total score across pre-and posttreatment assessments ($F_{1,34}$ = 18.6, p < .001) with both groups showing a decrease over time. No group × time interaction was found at posttreatment ($F_{1,34}$ = 3.7, p = .06).

CDI. A significant within-group main effect was noted for the CDI total score across pre-and posttreatment assessments ($F_{1,34}$ = 12.8, p < .001) with both groups showing a decrease over time. No significant group × time interaction was found ($F_{1,34}$ = 0.3, p = .61). At follow-up, there was no significant time main effect or group × time interaction, suggesting that the gains made at posttreatment were maintained at follow-up.

COIS-P. A significant within-group main effect was noted for the COIS-P total score across pre- and posttreatment assessments ($F_{1,33}$ = 31.2, p < .001). No group × time interaction was found ($F_{1,33}$ = 3.4, p = .08). At follow-up, there was no significant time main effect or group × time interaction ($F_{1,19}$ = 3.7, p = .07), suggesting that gains were maintained at follow-up.

FAS. A significant within-group main effect was noted for the FAS total score across pre-and posttreatment assessments ($F_{1,34}$ = 21.6, p < .001) with both groups showing a decrease over time. A significant group × time interaction was found with a greater reduction in the FAS total score for the intensive group ($F_{1,34}$ = 4.8, p < .05). At follow-up, there was a significant time main effect ($F_{1,21}$ = 12.4, p < .01) but no group × time interaction, suggesting that families in both conditions displayed a modest relapse in level of family accommodation over time.

Combined CBT and Medication Effects

Thirteen youths in the intensive group were receiving concurrent medication versus 11 in the weekly condition (χ_1^2 = 0.4, p = .52). Of those taking medication, 9 were male and 23 white. Similar numbers of youths in each group were taking multiple medications (intensive n = 7, weekly n = 5). Medications being taken by the entire sample are shown in Table 3. Based on parent report, the few youths taking low medication doses were doing so because of side effects associated with upward titration or no additional benefit at higher doses. No meaningful group dose differences were found across specific medications. Complete medication breakdowns, demographics of the medication/nonmedication groups, and statistical findings can be obtained from the first author.

When comparing children with and without concurrent pharmacotherapy, no significant group × time interactions were found across any variables, suggesting

TABLE 3
Medications Being Taken by Participants

Medication	No. Taking	Mean Dose (Range), mg
Sertraline	10	107.5 (25–200)
Citalopram	2	20 (20)
Escitalopram	4	22.5 (10–40)
Fluoxetine	3	30 (10–60)
Fluvoxamine	3	91.7 (75–100)
Venlafaxine	1	75
Bupropion	3	216.7 (200–250)
Aripiprazole	4	17.5 (10–20)
Risperidone	2	0.75 (0.5–1.0)
Quetiapine	2	200 (200)
Clonipine	2	0.5 (0.5)
Mirtazapine	1	15
Imipramine	1	50
Divalproex sodium	1	500

that those stabilized on medication at pretreatment did not have a different outcome relative to those not taking medication.[2] For example, no significant group × time interaction was found on the CY-BOCS between those on medication and those who were not ($F_{1,38} = 0.8$, $p = .38$, mean$_{Medication}$ 12.4, mean$_{No\ medication}$ 9.2).

DISCUSSION

Although CBT has been identified as an efficacious treatment for pediatric OCD, many youths are unable to access treatment because of barriers, particularly the shortage of trained practitioners and geography. One potential solution, with support in adult OCD patients (e.g., Abramowitz et al., 2003; Foa et al., 2005) and preliminary support in youths (Franklin et al., 1998; Storch et al., 2006), is intensive CBT. With this in mind, we report results from the first randomized trial comparing outcomes for intensive and weekly CBT for pediatric OCD patients.

Overall, both intensive and weekly treatment conditions showed marked improvements, with effect sizes on the CY-BOCS of 2.62 and 1.73, respectively. A slight advantage for intensive treatment at posttreatment was shown on remission and improvement rates; however, differences were generally not present at follow-up. That differences were not maintained at follow-up suggests the need for additional care following intensive treatment. This care may come in the form of weekly in-person or telephone (when geographically isolated) booster sessions. Consistent with Abramowitz et al. (2003), our findings suggest that both approaches eventually achieve a similar endpoint, but that intensive treatment may be somewhat more expedient. Alternatively, it could be interpreted that the effects of intensive CBT deteriorate slightly over time, perhaps because of difficulty maintaining and/or generalizing treatment gains upon treatment conclusion. Abramowitz et al. (2003) suggest that longer and more varied intervals between weekly therapy sessions may hinder learning during acquisition but enhance retention because of increased generalization of skills across varied contexts. In contrast, the amassed exposure practice occurring during intensive treatment may maximize immediate performance but be associated with modest performance deterioration in less controlled environments.

Analysis of secondary outcomes showed greater reductions in family accommodation and OCD-related impairment in the intensive condition relative to those receiving weekly treatment. Our treatment protocol was specifically tailored toward addressing problematic family dynamics that may be linked to greater overall impairment by virtue of affecting family members. Together with the findings of Barrett et al. (2004), who also used a family-based approach, these data further suggest that family-based cognitive-behavioral interventions may have advantages over individual approaches in treating pediatric OCD.

No difference was found between youths receiving CBT and medication versus those receiving CBT alone. Although adult studies have produced inconsistent findings regarding the additive effects of medication to CBT (e.g., Foa et al., 2005), the Pediatric Obsessive-Compulsive Disorder Treatment Study Team (2004) study demonstrated a benefit from combined treatment on the CY-BOCS total score. One possibility is that youths taking medication(s) had greater symptom severity than unmedicated youths, which may have been partially reduced with medication management. Notably, few data exist on the efficacy of CBT for medication nonresponders. In the most rigorous trial to date, Tolin et al. (2004) found promising results using a waitlist controlled open trial to examine the additive benefits of CBT in 20 adults who had failed at least two serotonin reuptake inhibitor trials. Our findings provide initial support for CBT, either intensive or weekly, as an effective treatment for those with an incomplete medication response.

Although both treatment schedules were similarly efficacious, our data raise the question of which factors may indicate intensive versus weekly treatment. First, intensive treatment may be well suited for children with severe symptomatology or functional impairment (e.g., not going to school) in efforts to minimize the duration or impact of illness. Given that adult CBT predictor studies negatively link illness duration and severity with outcome (Mataix-Cols et al., 2002), reducing impairment rapidly may have important long-term implications. Alternatively, for those with less debilitating symptoms, a weekly approach may be preferable to avoid the commitment (e.g., parents taking off work, children missing school) sometimes associated with intensive treatment. Second, intensive treatment may be a viable treatment option for families without local access to a competent CBT provider. Inconsistent with practice parameters (American Academy of Child and

Adolescent Psychiatry, 1998; Pediatric Obsessive-Compulsive Disorder Treatment Study Team, 2004), approximately 70% of our sample had received non-CBT psychotherapy or no psychotherapy at all before enrollment. Because most intensive programs are located in university-based clinics, dissemination of this approach to other settings warrants attention. Finally, time-limited, intensive programs may enhance the child's motivation by becoming the primary focus for several weeks, which may not be the case with standard weekly treatment (Foa and Steketee, 1987). Daily sessions also permit close monitoring of therapeutic compliance and family dynamics, both of which may negatively affect treatment without adequate attention. We believe that the close monitoring and frequent feedback to family members about their behavior (e.g., providing reassurance) contributed to greater reductions in family accommodation among those receiving intensive treatment. Although intensive treatment has certain advantages, it also introduces a number of barriers (e.g., cost of relocating, challenge of securing time off from work, missing school and extracurricular activities, negotiating coverage for intensive treatment with insurance companies) that must be addressed before beginning treatment. In health science centers, connecting families with hospital support services may be useful in securing low-cost, temporary housing, and/or educational support.

Limitations

There are several limitations to the present study that should be noted. First, raters were aware that participants were receiving treatment and, given the temporal differences between pre- and posttreatment assessments for intensive and weekly conditions, were not blinded to group status at the postassessment. We believed that maintaining consistency among raters was important to minimize potential rater effect. We did not collect interrater reliability on the CY-BOCS at post- or follow-up assessments. Second, limited power resulting from our modest sample size prevented us from detecting small group differences. Third, a control condition was not incorporated into the study design, and it was not possible to control for time at posttreatment. Because pediatric OCD shows limited response to placebo or waitlist (e.g., Barrett et al., 2004; Pediatric Obsessive-Compulsive Disorder Treatment

Study Team, 2004), we thought it unnecessary to withhold treatment. Fourth, although youths were randomly assigned to group condition, pretreatment illness severity assessed by the CGI-S was greater for the intensive group relative to the weekly group. The weekly group was also older. Unequal variable distributions are a risk in modest-sized trials. It is possible that the shorter illness duration in the younger intensive group may have fostered improved outcome. Fifth, data from a number of children were not available at follow-up. Sixth, although treatment in both groups was of comparable integrity, the use of multiple therapists in the intensive group (versus one in the weekly group) introduces a possible bias perhaps by affecting the patient–therapist alliance or increased difficulty conveying subtle nuances that took place in session to members of the treatment team. Although it was not systematically measured, anecdotal reports indicated no concerns about alliance or treatment provision. Seventh, our results have limited generalizability given that recruitment took place at one clinic and the majority of youths were white and in families with a higher income than the U.S. median. Eighth, given the modest number of analyses and absence of any statistical correction, the possibility of committing a type I error is increased. Finally, our 3-month follow-up period does not provide an estimate of long-term treatment durability.

Clinical Implications

Intensive CBT was as effective as weekly treatment in youths with OCD with some advantages immediately after treatment. Because many families do not have access to trained CBT providers in close proximity to their homes, traveling to receive intensive treatment may be a viable treatment option in such cases. In addition, our data provide preliminary support for the utility of CBT for children who have had an incomplete response to past medication treatment. That differences were not found at follow-up suggests the need for additional care following intensive treatment. This may come in the form of weekly in-person or telephone (when geographically isolated) booster sessions.

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