Brief Report

Cognitive-behavioral therapy for bipolar disorders in adolescents: a pilot study

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Objectives: To develop a cognitive behavioral intervention for adolescents with bipolar disorders, test its feasibility and preliminary efficacy.

Methods: Based on existing research, a manualized, individually delivered cognitive behavioral intervention was developed and tested with adolescents with bipolar disorders as an adjunct to pharmacological treatment. Using existing data, baseline characteristics and outcome were compared to a matched group of eight adolescents with bipolar disorders who did not receive any psychosocial intervention.

Results: Preliminary results support the feasibility and efficacy of this manualized cognitive behavioral intervention.

Conclusions: Individually delivered cognitive-behavioral therapy (CBT) as an adjunct to pharmacological treatment is feasible and associated with symptom improvement in adolescents with bipolar disorders. Randomized controlled studies are needed.

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Bipolar disorder (BP) is a chronic, debilitating psychiatric condition, which affects approximately 1% of the population. BP is associated with comorbid psychiatric disabilities and substance abuse problems and often is disruptive to family, social, academic and vocational functioning (1–3). In fact, BP was recently ranked as the world's eighth greatest cause of medical disability (4). In addition, BP carries high mortality rates, as one-third of BP patients have attempted suicide at least once (5, 6). Given the severity and chronicity of BP, along with its impact on society, it is imperative that adequate, empirically supported interventions are available for individuals who are diagnosed with this disorder.

Although significant research has been dedicated to developing and evaluating treatments for adult BP (7–9), interventions for pediatric BP have only begun to emerge in the literature in the past decade. There is a growing body of literature suggesting that combined psychopharmacological and psychosocial interventions are optimal for treatment of adults with BP (10, 11), with recent national efforts focusing on developing consensus

on a template for treatment of BP in children and adolescents (12) and generating a public health intervention model for BP (13). Additionally, several recent clinical trials have investigated the usefulness of various pharmacological agents for pediatric BP (14–17). However, there is a paucity of research on psychosocial intervention with pediatric BP. Despite the call for psychosocial interventions with children and adolescents by clinicians, researchers and families living with BP, the severity of BP symptoms and outcomes and the amount of attention given to its psychosocial treatment with adults (18–20), empirically supported psychosocial interventions for children and adolescents with BP have been limited to multi-family psychoeducation groups for mood disorders (20, 21). Additionally, one small open trial supports the usefulness of cognitive behavioral interventions for these youth (22). Thus, the goal of this paper is to describe the development of and present preliminary data regarding the feasibility and efficacy of a newly developed manualized cognitive-behavioral treatment for adolescents with BP.

Treatment development

To develop an optimal psychosocial intervention, we reviewed empirical findings with regard to factors that contribute to the onset of BP and factors that affect its course of treatment. The second author performed a comprehensive literature review using PsychLit® and Medline® to gather current empirical literature related to the identification, assessment, etiology, course, prognosis and treatment of BP in adults and in youth (23). Based on this review, common problems/difficulties in this population were identified, from which we developed intervention components. These components include: (i) psychoeducation; (ii) medication compliance; (iii) mood monitoring; (iv) identifying and modifying unhelpful thinking; (v) stressor/trigger identification; (vi) sleep maintenance; and (vii) family communication (19). In addition, optional modules devoted to other problems common among adolescents with BP (i.e., substance abuse, social skills, anger management and contingency management) are offered.

In our attempts to develop interventions for these identified difficulties, we focused on cognitive-behavioral therapy (CBT) techniques that have been demonstrated in the literature to be useful in treating adults with BP. We also incorporated psychoeducation strategies, given that psychoeducation is the only promising psychosocial intervention for youth with BP that has been published to date (20). In addition, since

depressive symptoms are commonly part of BP symptomatology, particular attention was paid to treatments that have been found to be efficacious in treating adolescents with depression (24–26). This information was integrated with the authors' clinical experiences with CBT techniques and treatment of adolescent mood disorders to produce an outline of the skills and topics that would be potentially beneficial to this population. Various CBT treatment protocols served as models for the manual we developed, with particular emphasis on the manual in use in the ongoing National Institute of Mental Health (NIMH) funded 'Treatment for Adolescents with Depression Study' (TADS) (27, 28). John Curry, PhD, a principle investigator of the TADS project and first author on the TADS CBT manual gave permission for the use of material from the TADS manual.

Consistent with other cognitive-behavioral approaches, homework assignments were formulated to accompany each session in order to encourage regular practice of the skills taught. Modeled closely on the TADS treatment manual and Kathleen Carroll's (29) work with substance abuse, each session in the current intervention follows the same structure: (i) review of symptoms; (ii) review of homework from previous session; (iii) set the agenda (i.e., identify issues on which the adolescent would like to focus the session, such as conflict with family or friends, anxiety about an upcoming school project or event, etc.); (iv) teach a new skill (e.g., mood monitoring, problem-solving); (v) address (adolescent's) agenda items (with an attempt to apply newly learned skill to the previously identified agenda item); (vi) assign new homework.

The weekly treatment is delivered individually, but includes some parent involvement, as family involvement has been shown to be particularly useful to families coping with BP (30, 31). Thus, two sessions are co-joint sessions with the adolescent and parents, and one session midway through treatment is with parents only. Further, optional 15-min parent check-ins are offered at the end of every session for families with whom it seems advantageous. These check-ins can be used to review the skills taught in the session (e.g., remind parent how to apply the problem-solving strategy to a recent conflict with the adolescent or to obtain feedback from a parent on how a particular technique is working). We developed a 12-session treatment that incorporated all the modules/skills identified above. For more detail regarding session content and treatment delivery, see the review by Danielson et al. (23).

Method

Participants

Participants (n = 16) were youth aged 10–17 years, recruited through the Division of Child and Adolescent Psychiatry at a large midwestern hospital. Participants who met the criteria for a primary diagnosis of BP I, BP II, BP not otherwise specified (NOS) or cyclothymia were eligible. No youth with BP NOS enrolled in this study. Eight of the youth were active participants in the CBT treatment, and data from the other eight youth comprised the historical control group. Seven out of eight of these youth in the active treatment sample had previously been seen in the clinic for participation in a randomized psychopharmacological treatment for BP. With regard to the other participant, the parent had contacted the Division seeking help with maintenance of the child's BP. Historical controls were youth who also had received psychopharmacological treatment and then medication management within the context of medication clinical trials taking place in the Division. Table 1 provides demographic information for the active treatment and the control groups.

Inclusion criteria for both the active treatment group and the control group included being between the ages of 10 and 17 years and meeting DSM-IV diagnostic criteria for BP I, BP II, BP NOS or cyclothymia. Each participant had to have experienced at least one mood episode in the past 6 months, indicating clinically significant symptoms. In addition, each child was required to be stable on medication, as defined by no changes to medication in the 3 months prior to entry in the study. The exclusion criteria for the active treat-ment group included if the child or his/her family was unwilling or unable to keep medication stable for duration of treatment, if the child was actively psychotic or suicidal or if the child had a history of mental retardation or pervasive developmental disorder.

Therapists

Three therapists provided treatment. Two of the therapists (CKD and LS) were Master's level clinical psychology graduate students, who had completed training, practicum and supervision in CBT and manualized treatments. The third therapist and supervisor (NCF) was a licensed clinical psychologist who specializes in CBT, manualized treatments and treatment of anxiety and mood disorders.

Diagnostic measure

Schedule for Affective Disorders and Schizophrenia for School Age Children – Present and Lifetime Version (K-SADS-PL) (32). The Schedule for Affective Disorders and Schizophrenia for School Age Children – Present and Lifetime Version (K-SADS-PL) is a structured clinical interview designed to obtain severity ratings of symptomatology and assess lifetime history of psychiatric disorders. The K-SADS-PL divides symptoms surveyed into a screening interview and five diagnostic supplements and generates DSM-III-R and DSM-IV diagnoses. The interview has good reliability and validity and is a popular assessment instrument for diagnosis of childhood psychopathology (32, 33). Test–retest reliability kappa coefficients are reported to be in the excellent range for present and/or lifetime diagnoses for several psychiatric diagnoses, including bipolar disorder.

Outcome measures

The Young Mania Rating Scale (34). The Young Mania Rating Scale (YMRS) is an 11-item measure administered via interview in which the rater is asked to rank symptoms of mania on five explicitly defined grades of severity. Item scores range from 0 to 4, with higher numbers indicating greater severity of the symptom. The YMRS yields one score that can range from 0 to 60, with higher scores representing greater psychopathology. Symptoms were assessed for the past week. Adequate reliability and validity of the YMRS in adult populations (34) and child populations (35) have been established.

Table 1. Demographic and screening data for CBT and control groups

	Controls (n = 8)	CBT group (n = 8)
Age	14 (2.5 years)	14 (1.4 years)
Gender	40% Male	50% Male
Ethnicity	100% Caucasian	100% Caucasian
Economic status		
>$60,000 (%)	20	50
$40,000–60,000 (%)	80	50
Primary diagnosis		
BP I	6	6
BP II	1	2
Cyclothymia	1	0
Age of onset (years)	9.2 (4.1)	9.0 (2.9)
Length illness (weeks)	190 (166.60)	132 (90.42)
Primary comorbidity		
ADHD	80%	67%

CBT = cognitive-behavioral therapy; ADHD = attention deficit/hyperactivity disorder.

Inventory of Depressive Symptoms (36). The Inventory of Depressive Symptoms (IDS) is a 30-item interview-administered measure that is designed to assess symptoms of depression. All items are rated on a 0–3 scale, with higher scores indicating higher degrees of pathology. Symptoms were assessed for the past week. The reliability and validity of the IDS have been established with adult patients with major depression, bipolar depression and remitted depression (37), including good internal consistency ($\alpha = 0.88$) and construct validity. The IDS correlates highly with the Hamilton Rating Scale for Depression (HRSD) (38) ($r = 0.92$) and the Beck Depression Inventory (39) ($r = 0.61$). There is no published reliability and validity data for the IDS in pediatric populations.

The General Behavior Inventory (40). The General Behavior Inventory (GBI) is a 73-item self-report inventory with items focusing on mood-related behaviors (depression, hypomania and biphasic symptoms) over the past week. Responses are given on a four-point Likert scale, with '0' being 'never or hardly ever' and '3' being 'very often or almost constantly.' The measure has demonstrated excellent reliability and good discriminant validity with adult populations (41–43) and child populations, through parent report (44) and child self-report (45). In this study, the GBI was completed by a parent regarding their child and by the child him/herself. The GBI was only completed by the active treatment group and had not been administered to the controls.

Procedure

All procedures were approved by our institution's Institutional Review Board (IRB). Every participant in the study had been seen previously in the Division for a screening, an assessment and/or participation in a psychopharmacological trial for medication management of bipolar disorder in the 2 years prior to this study. Age and diagnosis matched controls were selected from ongoing assessment protocols in the Division. The data for these controls were taken from charts with non-identifying information; no contact was ever made with these families. To recruit active participants for the current study, parents of the children who had completed the pharmacological trial (including follow-up assessments) or those who had ceased participation in the treatment for side effect reasons and met all other inclusionary criteria for the present study were contacted by a research assistant or the second author (CKD) to describe

the treatment study. Screening questions were asked to insure that the child was stable on medication and that the child was not currently receiving therapy. An appointment was then scheduled to meet with the parent and child to inform them about the treatment and to attain informed consent.

After consent was obtained, the child was given a K-SADS-PL interview if one had not already been conducted. In all but one case, the K-SADS-PL had been completed as part of the previous psychopharmacological trial. In these cases where the K-SADS-PL had already been administered, research assistants (trained to an inter-rater reliability level of > 0.85) conducted the interview and a child and adolescent psychiatrist confirmed the diagnoses. The second author (CKD), who underwent the same K-SADS training as the research assistants, conducted the K-SADS-PL with the child and parent who had not been interviewed with the protocol previously.

Prior to beginning of treatment, a trained research assistant completed the IDS and the YMRS while meeting with the family, and then had the parent and child complete the GBI. These assessments were also given at post-treatment (i.e., after 12 sessions) and then at an 8-week follow-up. Therapy sessions were scheduled weekly on average, although sometimes due to scheduling conflicts, a few weeks would occur between sessions. All participants, with the exception of one, completed the treatment.

Treatment

Treatment development was described above. The 12-session individual treatment was manualized and the first author conducted the weekly therapist supervision. All participants received the same treatment modules in the same order, with the exception of two optional modules (sessions 10 and 11), which were chosen individually based on the specific needs of the youth.

Results

Given the small sample size, statistical analyses were constrained. We conducted completer analyses for pre- to post-treatment and more conservative last observation carried forward (LOCF) for pretreatment to follow-up comparisons. We report the frequencies and proportions and results of paired *t*-tests and ANOVAs, and provide effect sizes as a supplement to these significance tests.

Pretreatment diagnoses and symptom severity

K-SADS-PL diagnoses based on the adolescent and parent interview are presented in Table 1. All 16 adolescents met the criteria for a bipolar disorder: BPI, BPII or cyclothymia. The majority had comorbid attention deficit/hyperactivity disorder (ADHD) as well.

Interview-assessed symptoms

To examine changes in interviewer rated symptoms following the 12-session intervention, two (group: CBT versus controls) × two (time: pre and post) repeated measures ANOVAS were conducted on the IDS and YMRS. No main effects or interactions were observed. At post-intervention, participants in the CBT condition did not evidence significantly lower scores than controls on interview-administered measures of depressive symptoms [IDS; F (1, 8) = 1.96, p = NS] and manic symptoms [YMRS; F (1, 8) = 0.93, p = NS]. However, it is important to note that effect sizes were large for the IDS ($d = 0.90$) and moderate for the YMRS ($d = 0.62$). Effect sizes were calculated as the ratio of the estimated treatment effect (CBT score minus control group score at post or follow-up, after controlling for baseline scores) to the pooled SD at baseline.

To examine change in interviewer rated symptom measures from pretreatment to follow-up, two (group: CBT versus controls) × two (time: pre and follow-up) repeated measures ANOVAs were also performed. At 2-month follow-up, once again no main effects or interactions were detected; participants in the CBT condition did not evidence significantly lower scores than controls on interview-administered measures of depressive symptoms [IDS; F (1, 8) = 5.11, p = 0.05] and manic symptoms [YMRS; F (1, 8) = 0.07, NS]. Effect sizes were large for the IDS ($d = 1.6$) and small for the YMRS ($d = 0.00$). Mean values and standard deviations for both groups at all three time points are presented in Table 2.

Table 3. Means, standard deviations and effect size estimates for symptom measures at pre, post and follow-up for CBT participants

Measure	Pre-treatment	Post-treatment	Follow-up	Effect size Pre–post	Pre–FU
PGBI dep	96.0[a] (27.7)	70.0[b] (21.7)	75.7[b] (17.5)	1.25	3.53
PGBI man	46.5[a] (11.7)	36.3[b] (8.4)	40.2[a] (7.6)	1.12	1.29
CGBI dep	79.2[a] (27.6)	53.0[a] (9.2)	66.0[a] (18.4)	1.09	1.13
CGBI man	41.0[a] (9.9)	32.4[a] (5.4)	39.3[a] (11.3)	0.79	0.25

Means in the same row sharing the pretreatment superscript[a] are not significantly different from pretreatment values. Those with the superscript[b] are significantly different. Effect sizes were calculated for paired t's using the formula $d = 2t/\text{sqrt(df)}$.
PGBI = parent completed General Behavior Inventory; CGBI = child completed General Behavior Inventory; dep = depressive symptoms; man = manic and hypomanic symptoms; CBT = cognitive-behavioral therapy; FU = follow-up.

Self-reported depressive and manic symptoms

The GBI was administered in the CBT group only, therefore paired t-test were conducted to examine pre–post and pre- to follow-up change. Youth did not report a significant decline in manic [t (4) = 1.76, NS, $d = 0.79$] or depressive symptoms [t (4) = 2.43, NS, $d = 1.09$] from pre- to post. However, effect sizes were large for both indices. Effect sizes were calculated for paired t's using the formula $d = 2t/\text{sqrt(df)}$.

Similarly, when examining pre- to follow-up scores, youth again did not report a significant decline in manic [t (5) = 0.28, NS, $d = 0.25$] or depressive symptoms [t (5) = 1.26, NS, $d = 1.13$] from pre- to follow-up. In regard to effect sizes, they were small for the manic symptoms and large for the depressive symptoms. Mean values and standard deviations for the GBI subscales at all three time points are presented in Table 3.

Parent-reported depressive and manic symptoms

Parents did report a significant decline from pre- to post-treatment in both manic [t (5) = 2.75,

Table 2. Means, standard deviations and effect size estimates for symptom measures at pre, post and follow-up for CBT and control group

Measure	Pre-treatment CBT	Control	Post-treatment CBT	Control	Follow-up CBT	Control	Between-group ES Pre–post	Pre–FU
IDS	15.4 (9.9)	3.4 (8.2)	10.7 (9.2)	4.0 (7.9)	12.6 (5.4)	2.9 (5.0)	0.90	1.6
YMRS	8.8 (9.0)	10.3 (11.7)	4.4 (5.3)	14.7 (11.2)	6.0 (4.9)	8.1 (6.4)	0.62	0.00

Uncorrected descriptive statistics are reported here for all available data. Effect sizes were calculated as the ratio of the estimated treatment effect (CBT score minus control group score at post-treatment or follow-up, after controlling for baseline scores) to the pooled SD at baseline.
IDS = Inventory of Depressive Symptoms; YMRS = Young Mania Rating Scale; ES = effect size; CBT = cognitive-behavioral therapy; FU = follow-up.

p < 0.05, $d = 1.12$) and depressive symptoms [t (5) = 3.07, p < 0.05, $d = 1.25$] on the GBI. Indeed, effect sizes were large for both depressive and manic symptoms. When examining pre- to follow-up scores on the GBI, parents reported maintained gains in depressive symptoms [t (5) = 3.95, p < 0.05, $d = 3.53$], but not in manic symptoms [t (5) = 1.44, NS, $d = 1.29$].

Retention

Retention over the course of treatment was quite good. Eighty-seven percent (seven of eight) of the clients who participated in the CBT program completed the 12-session treatment.

Additional services sought during treatment

Almost no additional treatment or resources were sought during treatment. Of those who received CBT, only one client received additional services. One teen received Electro-Convulsive Therapy (ECT) at session 11 of treatment due to worsening depression symptoms. For the remaining 87% of the CBT participants, the treatment that we provided in conjunction with pharmacotherapy was sufficient.

Discussion

The results of this pilot study indicate that a comprehensive cognitive-behavioral manualized treatment for adolescents with BP who are currently being treated with medication is feasible and potentially efficacious. In a population in which treatment compliance is often problematic (15), all participants, with the exception of one, completed treatment. Results indicated that, according to parent report, both manic and depressive symptoms were substantially reduced following treatment. Although medication has typically been the standard and most effective treatment for both adults and youth with bipolar disorders (7, 46, 47), results of this study indicate that adolescents who are already stable on mood stabilizing medications can still benefit from psychosocial interventions. Additionally, this pilot study supports the feasibility of such additional treatment as indicated by the high retention. The support of this feasibility is an important finding, as parents of children and adolescents with BP often request additional help in the treatment of symptoms, above and beyond what is provided by medication. Although other symptom measures did not evidence statistically significant reduction, limited power substantially impacted our ability to detect statistical differences between groups (48). Indeed, power calculations

showed that a sample size of 26 participants per group would have been necessary to obtain significant results on our main between-group outcome measures (49). It is important to note that effect size estimates of the magnitude of the CBT change were moderate to large across all symptom measures in the active treatment group and where control group comparisons were possible, providing preliminary evidence that these youth appeared to benefit from the psychosocial intervention when compared to youth who did not receive the treatment.

This pilot study is the first controlled test of an individually delivered, manualized cognitive-behavioral treatment for adolescents with BP. Additionally, one uncontrolled trial has been published also providing preliminary support for CBT in this population (22). To our knowledge, the only other published psychosocial treatment model for adolescents with BP has been limited to psychoeducation which has been shown to improve both parent report of understanding of mood symptoms and parent report of reductions in child-expressed negative emotion (20, 21). Our treatment extended that which Fristad and colleagues. have tested by adding components aimed at building skills to improve mood symptoms and functioning. We also included components in the treatment that have been shown to be effective interventions in mood disorders with adults and other adolescent populations. Specifically, our treatment included skill-based training in problem-solving, goal-setting, medication compliance, communication and social skills, coping and relaxation and relapse prevention.

This pilot study also extends previous treatment studies of adolescents with BP by including measures of adolescent report of depressive and manic symptoms. Additionally, this intervention study had few exclusionary criteria and included adolescents with comorbid diagnoses, such as ADHD. Indeed, the majority of adolescents in both groups also met criteria for ADHD. Given the importance of maintaining flexibility in implementation of treatment manuals (50), we also included optional modules that targeted specific comorbid difficulties seen in many youth with BP (e.g., substance abuse, social skills deficits and anger management problems). Also, our pilot study included a control group, which included adolescents with BP being treated with medication only.

Despite numerous strengths, there are also several study limitations worth noting. The sample size is small, thus limiting power to detect statistically significant differences. However, the sample size is comparable to that of other recently published pilot studies testing psychosocial interventions (51). Interestingly, despite the small sample, the results

did show feasibility and significant treatment effects for parent report of mood symptoms. This result is promising as others have found that parent report better detects bipolar symptoms than either self-report or teacher report (52). Moreover, moderate to large effect sizes were seen across symptom measures and informants. The generalizability of the findings is limited by the fact that participants in the sample were Caucasian and primarily middle class. On the other hand, the fact that we included all bipolar spectrum disorders, instead of, for example of focusing on BPI, may limit the specificity of our findings. Future studies should be conducted with larger, more ethnically and socioeconomically diverse samples. In addition, despite the fact that we did have a control group, this was not a randomized study and the control group data were culled from chart review. Other limitations included that the control group was not administered the GBI and had more incomplete data than the treatment group and that not everyone in the treatment group completed the follow-up assessment. It is also worth noting while the treatment dropout rate was low in this sample, the study benefits (e.g., free CBT treatment) could have impacted study completion rate. In regard to future research, randomized controlled trials with larger and more diverse samples are needed to further evaluate the generalizability, feasibility and efficacy of this cognitive-behavioral treatment for youth with BP. Additionally, manualized interventions should be developed for and tested with younger children, especially children at risk for BP who may be likely to be diagnosed with BP in adolescence, in order to test whether or not such treatment can be used in a younger and/or at-risk population. Such risk factors that may indicate the need for early intervention include familial history of bipolar disorders and early problems with mood and temperamental dysregulation (53). In order to address the need for psychosocial interventions with younger at-risk children, we have adapted and are currently testing this promising treatment for such a population.

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