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Characteristics of the child behavior checklist in adolescents with depression associated with bipolar disorder

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Abstract

Background—The child behavior checklist-Juvenile bipolar disorder phenotype (CBCL-JBD) has been proposed as a distinct profile specific to children and adolescents who have been diagnosed with bipolar disorder. The objective of this study was to examine whether bipolar disorder youth with depression exhibit the “CBCL-Juvenile bipolar disorder phenotype.”

Methods—Thirty-two adolescents, ages 12–18 years, with a depressive episode associated with bipolar I disorder were recruited, and their primary caregivers completed the CBCL.

Results—Only the internalizing subscale (mean=70.2, SD=9.7) and total score (mean=71.5, SD=8.9) reached clinical significance (>70). Moreover, the CBCL-JBD profile scores of our subjects (204.6, SD=27.5) did not reach clinical significance (>210).

Limitations—Our subjects differed demographically from those in studies that have confirmed the CBCL-Juvenile bipolar disorder phenotype with regards to sex, age and ADHD comorbidity, thus limiting the interpretability of our comparisons with other studies. Furthermore, our investigation involved a small sample size and did not include a control group, which should be addressed in future studies.

Conclusions—The results of our study suggest that the CBCL-JBD profile is not characteristic of depressed youth with bipolar disorder. Better assessment tools for making an accurate and efficient diagnosis of bipolar disorder are needed so that appropriate treatment can be implemented and significant morbidity and mortality are minimized.

Keywords

Pediatric bipolar disorder; Bipolar depression; CBCL; CBCL-JBD

1. Introduction

Bipolar disorder (BD) is a common and recurrent condition, affecting familial, social and educational functioning. Indeed, according to the results of the National Comorbidity Survey-Adolescent Supplement (NCS-A), the lifetime prevalence of bipolar I and II disorders in adolescents is 2.9% (Merikangas et al., 2010). Despite the fact that youth with juvenile bipolar disorder (JBD) experience depression more frequently than mania and that depressive symptoms are often part of initial presentation, the emphasis in the literature has largely been on manic or mixed mood states (Chang, 2009). Additionally, depression associated with BD is often associated with significant morbidity and mortality, including risk of suicide. However, recognizing depressive symptoms that are part of BD as opposed to unipolar depression can be difficult, especially upon initial presentation. The importance of discerning between the two cannot be overstated, though, given the potential risk of manic activation in individuals with bipolar depression who are prescribed an anti-depressant (Goldsmith et al., 2011).

Several rating instruments have been validated and used as diagnostic and symptom severity assessments in JBD. The child behavior checklist (CBCL) is a well-studied standardized instrument that assesses the behavioral problems and social competencies of children ages 4 to 18 years, as reported by their caregivers (Achenbach, 1991a, b; American Psychiatric Association, 2000b). Biederman and colleagues (1995, 1996a, b; Faraone et al., 2005) found that children and adolescents who had been diagnosed with BD had a distinct profile on the CBCL; the “CBCL-JBD phenotype.” These findings have been replicated by other investigators (Giles et al., 2007; Hazell et al., 1999; Carlson and Kelly, 1998). Results of a meta-analysis showed that the CBCL-JBD profile can differentiate between children and adolescents with BD and those with ADHD, suggesting discriminant validity of the measure (Mick et al., 2003). The CBCL-JBD phenotype was defined by a profile of T-scores above 70 on the Anxious/Depressed, Aggression, and Attention Problems subscales (Faraone et al., 2005; Mick et al., 2003; Biederman et al., 2009). A sum of 210 on these subscales has also been shown to maximize the sensitivity, specificity, and positive and negative predictive powers when predicting a current diagnosis of bipolar disorder in children with ADHD (Biederman et al., 2009). None of the CBCL studies looked specifically at youth with bipolar disorder in a current depressed episode; rather subjects from aforementioned studies were either in a current manic state or current mood state was not specified.

Other literature suggests that the CBCL can predict, to varying degrees, depressive disorders. For example, Biederman et al. (1996a, 2005a, b), in two separate studies, found the Anxious/Depressed subscale to correlate well with unipolar major depression. Similarly, Eimecke and colleagues (2011) demonstrated low to medium predictive power of this subscale in both unipolar depressive disorder and other disorders with depressive symptomatology, including bipolar disorder.

Although the CBCL has been extensively studied in bipolar youth during manic or mixed episode and in youth with unipolar depression, there is a paucity of data on the CBCL profile of youth with depression associated with bipolar disorder. The aim of this study was to evaluate the CBCL profile of unmedicated adolescents with depression associated with bipolar disorder; we hypothesize that the CBCL profile of our subjects will fit the CBCL-JBD profile, given its purported utility in characterizing youth with BD.

2. Methods

This study was approved by the University of Cincinnati, the Cincinnati Children's Hospital Medical Center, and the Stanford University Institutional Review Boards. All subjects

provided written assent and legal guardians provided written informed consent prior to study participation. Thirty-two adolescents between the ages of 12–18 years who were diagnosed with bipolar I disorder, current episode depressed, were recruited from referrals to the Division of Bipolar Disorder Research at the University of Cincinnati and the Pediatric Bipolar Disorder Research Program at Stanford University from March 2006 through June 2007 (Table 1). Diagnosis was based upon Diagnostic and Statistical Manual of Mental Disorders, 4th edition, text revised (DSM-IV-TR) criteria, and determined using the Washington University in St. Louis Kiddie Schedule for Affective Disorders and Schizophrenia (WASH-U KSADS) interview (American Psychiatric Association, 2000a; Geller et al., 2001). All study participants had clinically significant scoring on the Children's Depression Rating Scale, Revised (CDRS-R) of >40 and were medication-free at the time of assessment (Poznanski et al., 1985; DelBello et al., 2009).

The CBCL inventoried the adolescent's behavior over the past six months and was completed by each subject's primary caregiver. The CBCL has 11 subscales: Delinquent Behavior, Aggressive Behavior, Withdrawn, Somatic Complaints, Anxious/Depressed, Social Problems, Thought Problems, Attention Problems, Externalizing Problems (includes Delinquent and Aggressive Behaviors), Internalizing Problems (includes Withdrawn, Somatic Complaints, and Anxiety/Depressed Problems), and Total Problems (includes Externalizing, Internalizing, Social, Thought, and Attention Problems) (Achenbach, 1991a, b). A cut-off score of 70 (2 SD above the norm) has been widely accepted as the clinically meaningful threshold for separating out psychiatrically referred and non-referred children (American Psychiatric Association, 2000b). Means and standard deviations were calculated for the CBCL subscales and composite scores described above.

3. Results

Adolescents with bipolar depression showed significantly elevated scores above the accepted norms in most of the CBCL subscales. However, a mean score of >70 , indicative of clinical significance, was only evident in the internalizing subscale (mean=70.2, SD=9.7) and the total score (mean=71.5, SD=8.9). The Anxious/Depressed score was elevated (mean= 68.9, SD= 9.9) but did not reach the cutoff score for clinical significance. Likewise, the CBCL-JBD phenotype score was elevated (mean=204.6, SD=27.5); however, it did not reach the cutoff score of 210 (Table 2).

4. Discussion

Although the CBCL has been used extensively in youth with a wide variety of psychopathology, including JBD, to our knowledge, this is the first study to specifically examine its utilization in youth with a depressive episode associated with bipolar I disorder. A majority of prior studies focused on the diagnostic utility of the CBCL in bipolar youth with a manic or mixed mood state or who were euthymic. Despite some controversies about the sensitivity and specificity of its use in this population in general, previous studies found the CBCL to be useful in identifying individuals with bipolar disorder. Since Biederman et al. (1995) proposed that youth with JBD have a specific CBCL-JBD profile, characterized by an elevation in Anxious/Depressed, Aggression, and Attention Problems subscales, the CBCL has been viewed as a behavioral assessment tool that is trait (bipolar disorder, per se) rather than state (manic, mixed, depressive, euthymic) specific.

Results of our study show that the CBCL profile in medication-free adolescents with bipolar depression, although showing elevated scores of at least one SD above the mean in the majority of the subscales, reached the cutoff score of 70, indicative of clinical significance,

only in the internalizing subscale and total scores. The CBCL-JBD profile in our sample also failed to reach the cutoff score of 210 reported to be indicative of clinical significance.

Prior studies have explored the validity of the CBCL-JBD in youth. For example, Diler et al. (2009) studied the CBCL-JBD in children, younger than 12 years old, who were diagnosed with bipolar disorders I, II and Not Otherwise Specified; current mood state was not specified. The authors did not find the CBCL-JBD useful in discerning BD from other psychopathology; while a negative screen might rule out BD, a positive screen was non-specific. Significant differences in CBCL subscale scores between our study and that of Diler et al. were found in the domains of Social Problems, Thought Problems, Aggressive Behaviors as well as CBCL-JBD profile scores. In another study, Dienes et al. (2002) assessed offspring of bipolar parents, ages 6 to 18 years. Of these, 16 subjects were diagnosed with bipolar disorder themselves (BD group; again, current mood state was not specified). The authors concluded that the CBCL identified subjects with clinical disorders and reflected greater pervasive disturbance in the children with bipolar disorder. The CBCL profile of our sample differed from that of Dienes et al.'s in some domains, including Withdrawn, Somatic Complaints, Social Problems and Aggressive Behavior. Most importantly, in both comparison studies, the CBCL-JBD profile scores reached the level of clinical significance at 215.9 (SD=21.6) and 219.3 (SD=21.2), respectively, whereas ours did not (Graph 1).

A literature search was performed for CBCL scores of children and adolescents with depression. Biederman et al., (1996a) assessed the CBCL scales of children with major depression (mean age 13.8, SD 3.0). The authors concluded that the CBCL Anxious/Depressed and other internalizing scales adequately discriminated between unipolar depressed and non-depressed children regardless of ADHD comorbidity. With the exception of Rule Breaking and Aggressive Behaviors, syndrome sub-scale scores from our sample population were similar to those of Biederman and colleagues' depressed subjects without comorbid ADHD. Hepperlin and colleagues' (1990) study of youth ages 11 to 18 years with unspecified depression concluded that the CBCL measures poorly predicted Children's Depression Inventory (CDI) scores. Our data corresponded with internalizing and externalizing broad-band scales and total scores in this study of depressed youth. Overall, our data in bipolar depressed youth correlated with that of studies involving depressed adolescents.

We conclude that the CBCL-JBD profile fails to identify youth in the depressive phase of bipolar disorder. In light of these findings, we propose diagnostic sensitivity of the CBCL-JBD profile is contingent upon the bipolar child presenting in a manic or mixed state; in other words, our results introduce the idea that this profile is state-specific rather than trait-specific. An assessment tool which supports diagnosis based on discerning and stable traits of true JBD would be ideal. This conclusion is perhaps consistent, however, with the purported dimensional paradigm of the CBCL (Biederman et al., 1996a, b). Biederman et al. described the categorical paradigm, which is based upon discrete medical syndromes that require fulfillment of specific criteria for diagnosis. In contrast, the authors elaborate upon the dimensional approach of the CBCL whereby pathology is viewed on a continuum and focus is placed upon capturing deviation from a norm rather than a specific diagnosis.

One significant limitation of our comparison of our subjects to those in Diler's and Dienes' studies is notable demographic difference; differences in sex, age and ADHD comorbidity limit the interpretability of our comparisons with other studies. Further investigation with a larger sample size as well as a control sample is warranted. Nonetheless, our study does contribute to the limited extant literature focusing on depression associated with bipolar disorder. Diagnostic tools that discern unipolar and bipolar depression are needed. Only

after accurate and efficient diagnosis can appropriate treatment be implemented to minimize the significant morbidity and mortality that is inherent to untreated bipolar illness.

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Graph 1.
Comparison of CBCL subscales and total scores of our sample with other studies.

Table 1

Demographic and clinical variables.

Sex (female), <i>n</i> (%)	22 (69)
Age (years), mean (SD)	15.3 (1.8)
Race (White), <i>n</i> (%)	26 (81)
ADHD, <i>n</i> (%)	4 (13)

Table 2

CBCL subscales and total scores.

	BP depressed (<i>n</i> = 32)	
	Mean	SD
Withdrawn	69.2	11.0
Somatic complaints	66.8	9.9
Anxious/Depressed	68.9	9.9
Social problems	62.1	10.3
Thought problems	64.9	10.2
Attention problems	66.6	11.7
Rule breaking behavior	68.1	10.3
Aggressive behavior	69.1	11.3
Internalizing	70.2	9.7
Externalizing	69.0	9.6
Total	71.5	8.9
CBCL-JBD	204.6	27.5