RESEARCH ARTICLE

Borderline Features in Youth with Bipolar Spectrum Disorders

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Abstract: ***Background/Objectives:*** Differentiating bipolar disorder (BD) from a borderline personality disorder (BPD) can be diagnostically challenging as symptoms such as, depression, aggression and interpersonal relationships are common to both conditions. Identifying related and unrelated items between BD and BPD may improve diagnostic accuracy since both diagnoses have varying treatments which can be implemented before a behavioral emergency occurs. This study sought to determine which features of BPD, as assessed by the Borderline Personality Features Scale-Child (BPFS-C), are related to BD in youth diagnosed with BD.

Methods: Thirty participants (M: 16, F: 14), with BD, aged 7-17 years (mean ± standard deviation, 12.95 ± 3.08 years) met DSM-V criteria for BD I (n=20) and BD II (n=3). The Course and Outcome of Bipolar Youth criteria was used to establish the BD–Not Otherwise Specified diagnosis (n=7). The 24-item self-report BPFS-C was administered to the youth. Two-tailed Pearson correlations were performed to assess associations between scores on the BPFS-C with scores on various psychopathology-related predictor variables while adjusting for age, race and primary BD diagnosis.

Results: Higher BPFS-child scores positively correlated with child scores of more severe depression, self-injurious behaviors, and increased impulsive aggression.

Conclusion: BPFS-child scores may assist clinicians in identifying youth with BD who may be on the trajectory to developing BPD and thus, implementing targeted psychotherapeutic interventions.

1. INTRODUCTION

Among personality disorders, Borderline Personality Disorder (BPD) is the most common in adults with bipolar disorder (BD) (Vieta, Colom, Martínez-Arán, Benabarre, & Gastó, 1999). BD and BPD not only share common correlates and risk factors but are also risk factors for each other (Benazzi, 2007; Merikangas *et al.*, 2007). Although it varies as a function of BD subtype, an estimated 12-30% of adults with BD have comorbid BPD (Benazzi, 2000; Fan & Hassell, 2008; Rossi *et al.*, 2001). Within subtypes, 10% of adults with BD-I and 23% of adults with BD-II were found to have BPD (Zimmerman & Morgan, 2013). In comparison to bipolar adults without a personality disorder, bipolar adults with a comorbid personality disorder have significantly greater impairment in overall functioning, more suicide attempts, longer recovery time, more frequent and longer hospitalizations, and decreased compliance with medications (Carpiniello, Lai, Pirarba, Sardu, & Pinna, 2011; Colom, Vieta, Martinez-Aran, Reinares, & Gasto, 2000; Dunayevich *et al.*, 2000;

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George, Miklowitz, Richards, Simoneau, & Taylor, 2003; Kay, Altshuler, Ventura, & Mintz, 2002). Indeed, amongst psychiatric disorders, there is a high prevalence of individuals with bipolar disorder presenting to emergency room settings (San L *et al.*, 2016).

Although the association between BPD and BD in adults has been well established in the literature (Benazzi, 2006; Zimmerman & Morgan, 2013), the prevalence of BPD among youths with BD has not been as thoroughly explored. One potential reason for this may be the reluctance to diagnose a personality disorder when the brain, and presumably an individual's personality, is still actively maturing (Sharp, 2016a). Indeed, this rationale seems prudent, because a diagnosis of a personality disorder, and the stigma attached to it, may stay with an individual and not be re-assessed over time. However, emerging evidence suggests that personality characteristics form early and are as stable as they are in adulthood (Crick, Murray-Close, & Woods, 2005; Shiner, 2009). Consistent with this idea, the Diagnostic and Statistical Manual, 5th edition (DSM-V; American Psychiatric Association 2013) does not prohibit the diagnosis of a personality disorder in adolescents. The significance of being able to recognize the symptoms of BPD in adolescence lies in intervening at a time when maladaptive personality behaviors have not crystallized and are malleable to change using specific targeted treatments. Importantly, medication and therapy are both mainstays of treatment for BD, whereas therapy is key to the treatment of BPD, specifically dialectical behavioral therapy (Linehan *et al.*, 2006).

To date, few studies have examined the association between BD and BPD among adolescents. Kutcher *et al* (1990) found that adolescents with comorbid BD and BPD were subjected to greater antipsychotic use (Kutcher, Marton, & Korenblum, 1990). Fonseka *et al* (2015) assessed borderline personality symptom severity (BPSS) scores in the domains of identity confusion, interpersonal problems, impulsivity, and emotional liability (Fonseka *et al.*, 2015). It was found that those adolescents with higher BPSS scores had more severe depressive episodes with a younger age of onset of depression, increased non-suicidal self-injurious behavior and, decreased overall functioning. Notably, these adolescents had not been exposed to more psychotropic medications. In another study to assess for BPD symptoms in bipolar youth, at first follow-up after the age of 18 years, 271 participants from the longitudinal Course and Outcome of Bipolar Youth study were given the Structured Interview for DSM-IV Personality Disorders (SIDP-IV). Amongst these participants, 12.2% met criteria for BPD. The group with BPD did not differ from the group without BPD on demographic and diagnostic variables, BD subtypes, substance use disorders or family history of BD. However, the group with BPD had an increased severity of depression at baseline, more self-injurious behaviors and, a higher rate of suicide attempts (Yen *et al.*, 2015). Notably, the BD with comorbid BPD group represented the more clinically severe group. Additionally, the study reported no differences between the age of onset of BD, whereas Goldberg *et al*. (2009), found that having bipolar disorder at an early age increased the likelihood of developing BPD whether or not the child experienced abuse/trauma (Goldberg & Garno, 2009). To summarize, as is the case in adults, adolescents who carry a bipolar diagnosis have poorer clinical outcomes when there is a comorbid BPD diagnosis.

Family functioning and peer and social interactions are also significantly impaired in bipolar youth. (Geller *et al.*, 2000; Goldstein, Miklowitz, & Mullen, 2006). Impulsive aggression and problematic interpersonal functioning are common features of BPD as well (Koenigsberg *et al.*, 2001; Lazarus, Cheavens, Festa, & Rosenthal, 2014) and can similarly lead to concerns for self-harm or harm towards others. As noted above, when these disorders are comorbid, the likelihood of poorer outcomes increases.

The purpose of this study is to evaluate which clinical features usually associated with BD in youth, are associated with higher levels of borderline traits. Based on the current literature as noted above, we hypothesized that outpatient youth with BD, who exhibit more severe depressive symptoms, have self-injurious behaviors, in-

creased impulsive aggression and more problematic family functioning will have higher scores on the BPFS. Thus, these factors may serve as early indicators within those bipolar youth who may go on to develop BPD as they mature into adulthood. While the current study is cross-sectional, evidence that more severe depression and self-injurious behavior associated with higher levels of borderline features in bipolar youth will encourage clinicians to assess for borderline features in those already diagnosed with bipolar. This then has the potential to help early identification and treat an emerging personality disorder before it becomes entrenched.

2. METHODS

2.1. Patient Referral and Recruitment

Patients were recruited from the Texas Children's Hospital (TCH) outpatient pediatric bipolar disorders clinic. Referrals to this clinic are primarily from pediatricians, schools, mental health professionals, or self-made. All patients presenting to this clinic are thoroughly evaluated by a board-certified child and adolescent psychiatrist. The initial evaluation includes the use of clinician, parent/caregiver and self-report rating scales assessing the severity of mania, depression and other psychiatric symptoms.

2.2. Ethical Approval

The Institutional Review Board at the Baylor College of Medicine, USA approved this study. Parents/caregivers provided written informed consent and children and adolescents provided assent for the study.

2.3. Pediatric Bipolar Diagnosis

Children and adolescents were evaluated in the TCH clinic between July 2013 and April 2016. The diagnosis of bipolar type I and bipolar type II was based on DSM-V guidelines, while the diagnosis of bipolar disorder not otherwise specified (BP-NOS) was based on the Course and Outcome of Bipolar Youth (COBY) research criteria (Axelson *et al.*, 2006). All children/adolescents who presented to the TCH specialty clinic and met cri-

teria for BD-I, BD-II, or BP-NOS were invited to participate in this study. Children and adolescents with psychotic disorders, eating disorders, attention-deficit hyperactivity disorder without comorbid bipolar disorder, anxiety disorders without comorbid bipolar disorder, substance use disorder, intellectual disability, autism spectrum disorder and severe neurological conditions were excluded from this analysis.

2.4. Clinical Measures

The following rating scales and assessment tools were used: The Young Mania Rating Scale (YMRS), the Quick Inventory of Depressive Symptomatology (QIDS), the Buss-Perry Aggression Questionnaire (BPAQ), the Family Adaptability and Cohesion Evaluation Scale (FACES) and, the Borderline Personality Function Scale-Child (BPFS-C).

The YMRS is an 11-item, clinician-administered rating scale used to measure the severity of manic symptoms in child and adolescents aged 5-17 years. The range of scores is from 0-60. A score of 12 and above is considered the potential for hypomania or mania (Young, Biggs, Ziegler, & Meyer, 1978).

The QIDS is a 16 item self-report depression scale that assesses symptom domains of major depressive disorder. Scores range from 0-27 and include the following categories: 0-5 (not depressed); 6-10 (mild depression); 11-15 (moderate depression); 16-20 (severe depression); 21-27 (very severe depression) (Rush *et al.*, 2003). The QIDS-A17 was used with adolescent patients and has been validated for ages as young as 12 (Haley, 2009).

The Buss-Perry Aggression Questionnaire is a 29 item self-report tool used to assess domains of physical aggression, verbal aggression, anger, and hostility. It has been validated in children as young as age 9. Scores are normalized on a 0 to 1 scale with 1 being the maximum level of aggression for that domain (Buss & Perry, 1992)

The FACES is a self-report and assesses family communication, satisfaction, and adaptability

of a family to change its role relationships and structure in response to periods of stress (Olsen, Portner, & Bell, 1982).

The BPFS-C scale has been tested and validated for assessment of features of BPD in adolescents in an inpatient setting. The BPFS-C is a 24-item office based, self-report scale developed to assess borderline personality features in children and adolescents and has been validated for use in children as young as 9 years. Four subscales constitute the BPFS-C: affective instability, identity problems, negative relationships, and self-harm. Questions are based on a 5-point scale with total score of 66 or higher being significant in children and adolescents (Chang, Sharp, & Ha, 2011).

2.5. Clinical Sample

Between July 2013 and April 2016, 685 children and adolescents (7-17 years, inclusive) were evaluated in the clinic of which, 75 met criteria for bipolar spectrum disorders (Table **1**).

Since utilization of the BPFS-C began in May 2014, only 30 youth with bipolar disorder completed the BPFS-C scale. Baseline demographics are illustrated in Table **2**. Thirty participants (M: 16, F: 14), aged 7-17 years, inclusive (Mean ± SD 12.95 ± 3.08 years) completed the BPFS-C and data from these participants were analyzed. Twenty participants were diagnosed with BD-I, three with BD-II, and seven with BP-NOS. The children and adolescents were predominantly white or Caucasian (n=25), and the most common comorbid diagnosis was ADHD (n=16).

The families were asked about a family history of psychiatric illnesses. None of the families reported having a family member with a diagnosis of borderline personality disorder.

Table **2** lists 37 family members with a history of bipolar disorder. In a few families, several members within the same family had a diagnosis of bipolar disorder.

3. DATA ANALYSIS

Two-tailed Pearson correlations were conducted using IBM SPSS version 20 (IBM Corp, Armonk, NY). All significance levels reported are two-sided and p-value ≤ 0.05 was considered significant. Two-tailed Pearson correlation was performed to assess correlations between BPFS-C and the following scales while adjusting for age, race and, primary BD diagnosis: QIDS, YMRS, and BPAQ. Our rational for selecting these scales was they assess for depressive symptoms, manic symptoms, and aggression respectively. The Cohesion and Adaptability sub-scales of the FACES were included in this correlation table as they were felt to be particularly relevant in assessing for family functioning in this group.

4. RESULTS

BPFS-C was significantly correlated with the QIDS and BPAQ scales after adjusting for multiple comparisons with Holm-Bonferroni sequential correction. The results are shown in Table **3**.

Subsequently, to further characterize which subscales most contributed to this finding, a correlation was done between all BPFS-C subscales and BPFS-C total score against the QIDS subscales and QIDS total score, as well as all BPFS-C subscales and BPFS-C total score against the BPAQ subscales and BPAQ total score. Tables **4** and **5** summarize these findings.

As shown in Table **4**, after adjusting for multiple comparison testing, the only correlation that remained significant in the comparison with QIDS was between overall BPFS-C Total score and QIDS Total score, suggesting that one individual subscale is not strongly and independently driving the overall correlation in these measures, but that the measures combined are associated with one another. However, given that the subscales are not independent of one another, Holm-Bonferroni multiple comparison testing may be overly conservative in this scenario. Given this, we felt all scales significantly correlated at the < 0.05 level before Holm-Bonferroni correction were worth noting.

Table 1. Primary diagnoses seen in the clinic July 2013-April 2016.

Total	685	100 %
Bipolar Disorder	75	10.94 %
ADHD	373	54.45 %
Depression	68	9.92 %
Autism Spectrum Disorder	9	0.13 %
Other	160	23.36 %

Table 2. Demographic characteristics of the study sample.

	CASES
N	30
Gender	
N of males	16
N of females	14
Age in years (mean ± SD)	12.9 ± 3.1
Race	
N of White or Caucasian	25
N of Black or African	4
N of Other	1
Ethnicity	
Non-Hispanic or Non-Latino	25
Hispanic or Latino	5
Diagnosis	
Bipolar 1	20
Bipolar 2	3
COBY Bipolar NOS	7
	Mean Age(±SD)
Bipolar 1	13.3 ± 2.8
Bipolar 2	14.8 ± 0.3
COBY Bipolar NOS	12.8 ± 3.7
Comorbid Diagnosis	
Attention Deficit Hyperactivity Disorder	16

(Table 2) Contd…

Oppositional Defiant Disorder	2
Intermittent Explosive Disorder	3
Panic Disorder	1
Anxiety Disorder	1
Family Psychiatric History	*Total Cases*
Bipolar Disorder I	36
Bipolar Disorder II	1
Schizophrenia	6
Alcohol Use Disorder	7
Attention Deficit Hyperactivity Disorder	8
Major Depressive Disorder	16
Autism	1
Other Drug Abuse Not Specified	3
Anxiety Disorder	1
Panic Disorder	2
Generalized Anxiety Disorder	4

Table 3. Two-tailed PEARSON correlations between BPFS-C and selected scales, reported as correlation (significance).

-	QIDS	YMRS	BPAQ	FACES Cohesion	FACES Adapt
BPFS-C	0.547 (0.003)**	0.011 (0.956)	0.747 (0.000)**	-0.288 (0.194)	-0.387 (0.075)

**Significant at $p < 0.05$ after correction for multiple testing.

Table 4. Two-tailed Pearson correlations between BPFS-C subscales and total score, and QIDS subscales and total score.

-	QIDS Total	QIDS Suicidal	QIDS Irritable
BPFS-C Total	0.547 (0.003)**	0.498 (0.010)*	0.389 (0.045)*
BPFS-C Negativity	-0.083 (0.682)	0.158 (0.442)	-0.032 (0.873)
BPFS-C Affective	0.017 (0.931)	0.345 (0.084)	0.088 (0.663)
BPFS-C Identity Disturbance	0.345 (0.078)	0.484 (0.012)*	0.270 (0.173)
BPFS-C Self-Harm	-0.283 (0.152)	-0.238 (0.241)	-0.439 (0.022)*

Note. Results are reported as Correlation (Significance).
*Significant at $p < 0.05$.
**Significant at $p < 0.05$ after correction for multiple testing.

Table 5.   Two-tailed Pearson correlations between BPFS-C subscales and total score, and BPAQ subscales and total score.

-	BPAQ Total	BPAQ Physical	BPAQ Verbal	BPAQ Anger	BPAQ Hostility
BPFS-C Total	0.747 (0.000)**	0.616 (0.001)**	0.665 (0.000)**	0.620 (0.001)**	0.730 (0.000)**
BPFS-C Negativity	0.520 (0.003)**	0.428 (0.029)*	0.432 (0.028)*	0.374 (0.060)	0.564 (0.003)**
BPFS-C Affective	0.486 (0.012)*	0.349 (0.081)	0.418 (0.034)	0.548 (0.004)**	0.453 (0.020)*
BPFS-C Identity Disturbance	0.254 (0.211)	0.105 (0.611)	0.308 (0.126)	0.186 (0.362)	0.354 (0.076)
BPFS-C Self-Harm	0.065 (0.751)	0.128 (0.533)	-0.032 (0.878)	0.020 (0.925)	0.038 (0.854)

Note. Results are reported as Correlation (Significance).
*Significant at $p < 0.05$.
**Significant at $p < 0.05$ after correction for multiple testing.

In contrast, every subscale of the Buss-Perry Aggression Questionnaire, as well as the total score, was significantly correlated with BPFS-C Total score after correction for multiple testing. As seen in Table **5**, this appears to be primarily driven by relationships between the BPFS-C Negativity and Affective subscales and the BPAQ. As with the QIDS analysis, because subscales were highly interdependent, all scales correlated at the < 0.05 level before Holm-Bonferroni correction were noted.

5. DISCUSSION

To our knowledge, this is the first study to utilize the BPFS-C to evaluate if there is an association between bipolar symptoms and borderline personality features in children and adolescents. As hypothesized, study results demonstrate that higher BPFS-C scores in youth who carry a BD diagnosis are associated with more severe depressive symptoms, self-injurious behaviors and increased impulsive aggression.

This study reports that youth who were more depressed were the ones with significantly higher total scores on the borderline features scale. Of note, when obtaining the QIDS and BPFS-C from youths, clinicians may know that higher total QIDS scores will more likely co-relate with higher scores on the total BPFS-C scale and that anyone subscale on either scale does not drive this relationship. However, with regard to the aggression severity, higher scores on each subscale of the BPAQ as well as high BPAQ total score, significantly correlated with higher BPFS -C Total score.

Over time and with treatment the question is if depressive symptoms improve will the BPFS -C scores decrease as well? This can be answered in a longitudinal study. Similarly, as aggressive symptoms decrease will that reflect a decrease in BPFS -C scores as well?

Following these youth over time will allow clinicians to   recognize whether borderline features are remaining consistent independent of depressive and aggressive symptomatology. This can, in turn, help clinicians understand when symptom-specific treatments such as DBT is warranted.

The percentage of bipolar youth with a family history of bipolar disorder is high in our study. This could be due to the small sample size. It can also be because ours is a specialty clinic for youth with mood disorders hence we evaluate a high percentage of youth presenting with and having a history of mood disorders. Bipolar disorder is highly heritable. Birmaher *et al* (2009) reported that offspring of parents with BD have a 14-fold risk of developing BD compared to offspring of parent without BD.

Although there is significant literature documenting problematic family functioning in bipolar youth, the results from this study did not support that. This may be due to a small sample size.

The DSM-V does not prohibit the diagnosis of BPD in adolescents. There are overlapping clinical features between BD and BPD such as emotion dysregulation, irritability, impulsive aggression and impulsivity itself. Therefore, how does one clinically differentiate bipolar disorder from a borderline personality disorder and when does one say they are comorbid? Bipolar disorder is an episodic mood disorder and symptoms specific for bipolarity include elated mood, decreased need for sleep, hyper sexuality, flight of ideas and grandiosity (Geller *et al.*, 2002). Although youth with BD have social and family functioning problems these tend to become better as the mood symptoms stabilize. Individuals with borderline features have interpersonal conflicts, chronic feelings of emptiness, and identity disturbance which are pervasively present (Barroilhet, Vöhringer, & Ghaemi, 2013; Zanarini, Frankenburg, Hennen, Reich, & Silk, 2006). Also, there is a strong association between sexual abuse history and the development of BPD.

Not assessing for and therefore not treating borderline features in adolescents has significant consequences such as continuation or magnification of suicidal behaviors, non-suicidal self-injurious behaviors, substance use problems, and continuous interpersonal conflicts (Miller, Muehlenkamp, & Jacobson, 2008). Thus, it is relevant to recognize maladaptive personality traits during adolescence so appropriate interventions can be made if comorbid BPD is present in addition to bipolar. BPD is highly responsive to dialectical behavioral therapy whereas literature suggests that medication management and family-focused therapy can be effective in managing bipolar symptoms. The key is in intervening prior to the development of the complete psychopathology that BPD entails. Adolescents can be taught interventions that may help prevent the development of ingrained maladaptive patterns of behaviors. This may enable a better quality of life and a better prognosis for them.

Recently, several reviews (Chanen *et al.*, 2008; Chanen & Kaess, 2012; Fonagy & Luyten, 2016; Sharp, 2016b; Sharp & Fonagy, 2015; Sharp, Kalpakci, Mellick, Venta, & Temple, 2015; Shiner & Tackett, 2014) have been published summarizing the literature in support of the following conclusions: (1) Standard psychiatric nomenclature allows for the diagnosis of BPD; (2) BPD features are not typical of adolescence and if left untreated are associated with poor long-term outcomes; (3) Symptoms of BPD are not better explained by typical adolescent development or other psychiatric syndromes; (4) Personality disorder symptoms are moderately stable through life; and (5) BPD in adolescents may be treated like any other psychiatric disorder and neglecting to do so may perpetuate the stigma attached to the disorder. These reviews also discuss several validated measures to assess BPD features in youth which will be invaluable to clinicians wishing to identify borderline traits in bipolar patients.

CONCLUSION

This study highlights the importance of the increased risk of emergence of borderline features in bipolar youth with depression and irritability. This can assist clinicians in early identification of youth with BD, who may be on the trajectory to developing BPD. This, in turn, stands to prompt early intervention and aid clinicians in implementing specific psychotherapeutic interventions with improved patient outcomes. Further research examining longitudinal data with larger samples is needed to corroborate these findings.

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DISCLOSURE

HUMAN AND ANIMAL RIGHTS

Humans were used for this study.

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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