



ORIGINAL ARTICLE

Suicide attempts in bipolar I patients: impact of comorbid personality disorders

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Objective: To evaluate the association between personality disorders (PDs) and suicide attempts (SAs) in euthymic patients with type I bipolar disorder (BD).

Methods: One-hundred twenty patients with type I BD, with and without history of SA, were evaluated during euthymia. The assessment included a clinical and sociodemographic questionnaire, the Hamilton Depression Rating Scale, the Young Mania Rating Scale, the Barratt Impulsiveness Scale, and Structured Clinical Interviews for DSM-IV Axis I and II Disorders. Logistic regression was employed to determine associations between history of SA and patient characteristics.

Results: History of SA was significantly associated with comorbid axis I disorder, rapid cycling, high impulsivity (attentional, motor, non-planning, and total), having any PD, and cluster B and C PDs. Only cluster B PDs, high attentional impulsivity, and lack of paid occupation remained significant after multivariate analysis.

Conclusions: Cluster B PDs were significantly associated with SA in patients with type I BD. High attentional impulsivity and lack of gainful employment were also associated with SA, which suggests that some cluster B clinical and social characteristics may exacerbate suicidal behavior in this population. This finding offers alternatives for new therapeutic interventions.

Keywords: Mood disorders; bipolar; personality disorders; suicide

Introduction

A suicide attempt (SA) can be defined as any self-infliction of harm with the intention of causing one's own death, which, in turn, is part of suicidal behavior (SB): a cognitive-behavioral gradation that involves thoughts of death, suicidal planning, SA, and suicide. In Brazil, attempted suicide and suicide are an important public health problem. Brazil is among the top 10 countries with the most deaths by suicide, and suicide is the third leading cause of death by known external causes. Unfortunately, in recent years, there has been a clear upward trend in suicide rates in the country. Worldwide, it is estimated that 1 million people die by suicide each year and that for each adult who dies by suicide, there are likely to be more than 20 others who have made one or more SAs.^{1,2} Although SB is influenced by several neurobiological and environmental factors, the presence of a psychiatric disorder is the primary risk factor. More than 90% of those who die by suicide have at least one diagnosis of mental disorder at the time of the event.¹

Bipolar disorder (BD) is associated with the highest risk of SB among all mental illnesses, and suicide is the leading cause of early death among patients with BD. It is estimated that approximately 50% of those with BD attempt suicide at least once in their lifetime, generally at the beginning of the course of the disorder; 11-19% die as a result.³⁻⁵ Personality disorders (PDs) are also associated with a high risk of premature death by suicide.⁶ The prevalence of PDs among those who die by suicide is high, ranging from 30-40%.⁷ Furthermore, these disorders are prevalent both in the general population, with rates around 10%, as well as in patients with BD, with rates of up to 50%.⁸ Among PDs, those in cluster B (i.e., antisocial, histrionic, narcissistic, and borderline PD) share many SB risk factors with BD, such as prior SA, family history of suicide, presence of recent stressful life events, high levels of impulsivity, and history of physical violence (including sexual violence) during childhood. The association between BD and cluster B PDs, perhaps mediated by the overlap of these risk factors, has a negative impact on the natural history of BD, further increasing the risk of SB in this population.^{4,9,10}

Despite current evidence that BD and PD independently increase suicide risk, few studies that evaluated the impact of this comorbidity on SA have considered the influence that symptomatological state may have on the diagnostic assessment of comorbid PD among patients

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with BD. Furthermore, to the best of our knowledge, no studies have evaluated the impact of PDs on SAs in patients with type I BD who were evaluated in euthymia, using strict criteria to define this state, and controlling for the presence of other psychiatric comorbidities and levels of impulsivity. Moreover, little is known about the relationship between BD, comorbidity with cluster A and C PDs, and SA. Thus, the objective of this study was to evaluate the impact of PDs on SAs in patients with type I BD who were evaluated exclusively in euthymia.

Methods

Ethical issues

This study was conducted in accordance with the Declaration of Helsinki. The Ethics Committees of Maternidade Climério de Oliveira, Universidade Federal da Bahia, state of Bahia, Brazil, approved the study protocol. After providing written informed consent, patients were evaluated in person by trained and experienced investigators (psychiatrists and psychologists) who had formal training and at least 5 years of extensive experience in administering all instruments.

Sample

This cross-sectional study evaluated a convenience sample of outpatients with type I BD who sought treatment at Programa de Avaliação Continuada do Centro de Estudos de Transtornos de Humor e Ansiedade (CETHA), Hospital Universitário Professor Edgard Santos, from November 2010 to December 2014. Subjects who met the following inclusion criteria were invited to participate in the study: age 18 years or older, confirmed diagnosis of BD type I according to DSM-IV criteria, and current euthymic state, defined as having scores below 7 on both the Young Mania Rating Scale (YMRS)¹¹ and the Hamilton Depression Rating Scale (HDRS)¹² for at least 2 months. The exclusion criteria were as follows: inability to understand the study or complete the research instruments; and refusal to participate in the study or to sign the informed consent form.

Of the 143 patients with type I BD who were deemed eligible for inclusion, 140 (97.9%) agreed to participate, three (2.09%) were excluded due to non-euthymic state during the evaluation period, three (2.09%) were excluded due to a diagnosis of type II BD, and 14 (9.79%) were excluded due to difficulty in understanding and completing the study instruments. Thus, 120 patients (83.9%) completed the study.

Procedures

All eligible patients rated the intensity of their mood symptoms as a determination of whether they were in symptomatic remission at the time of evaluation. The following instruments then were administered: Semi-Structured Interview of the Brazilian Research Consortium for Bipolar Disorder, to collect sociodemographic and clinical variables; Structured Clinical Interview for DSM-IV Axis I

Disorders (SCID-I)¹³; Structured Clinical Interview for DSM-IV Axis II Personality Disorders (SCID-II)¹⁴; and the Barratt Impulsiveness Scale (BIS-11).¹⁵ These instruments have been validated for use in the Brazilian population.

Following this evaluation, patients were divided into two groups: those who had attempted suicide and those who had not. Lifetime SA histories were identified using the SCID-I questionnaire,¹³ and an SA was defined as any act of self-injury inflicted with the intention of causing one's own death.¹

Data analysis

Data were processed and analyzed using SPSS version 16. Initially, the Kolmogorov-Smirnov test and Bartlett's criteria were applied to descriptive statistics. Categorical variables were presented as absolute and relative frequencies, while continuous variables were summarized using mean and standard deviation (SD). Continuous data were analyzed with Student's *t*-test for independent samples. Pearson's correlation coefficients were calculated to assess the degree of association between the variables of interest. Pearson chi-square and Fisher's exact tests were used to compare frequency data.

To convert continuous variables into categorical data for use in multivariate analysis, total impulsivity scores and their subscales were categorized as follows: total impulsivity was divided into low (< 52), normal (52-71), and high (> 71) levels based on the Stanford et al. criteria¹⁶; and attentional, motor, and non-planning impulsivity subscales were divided into low and high levels based on the sample median, with high attentional impulsivity defined as a score > 19, high motor impulsivity > 21, and high non-planning impulsivity > 25. Only subjects in the high impulsivity categories were included in the bivariate and multivariate analyses.

Multivariate analyses were performed using logistic regression to verify the association of the studied factors with SAs. Variables with a *p*-value < 0.20 on univariate analysis were selected as independent variables for multivariate study. A stepwise selection process was applied to obtain a reduced model. Those variables with *p* < 0.05 were retained for the multiple regression model. Unadjusted and adjusted odds ratios (ORs) and 95% confidence intervals were calculated. All statistical methods were two-tailed, *p*-values were calculated, and the significance level was set at < 0.05.

Results

The mean \pm SD age was 43.5 \pm 11.9 years, the mean age at first mood episode was 26.8 \pm 9.7 years, and the mean number of years of education was 11.5 \pm 4.2 years. All patients (*n*=120) had a lifetime history of taking at least one mood stabilizer (valproic acid, carbamazepine, or lithium) and 72.5% (*n*=87) were taking lithium during data collection. The mean rates of impulsivity were 67.2 \pm 14.1 for total impulsivity, 19.8 \pm 3.6 for attentional, 21.7 \pm 6.8 for motor, and 25.8 \pm 6.2 for non-planning impulsivity. However, when the sample was divided into two groups by

Table 1 Clinical and sociodemographic characteristics of patients with type I bipolar disorder (n=120)

Variables	Total (n=120)	Suicide attempt (n=49)	No suicide attempt (n=71)	p
Gender				
Female	92 (76.7)	34 (69.4)	58 (81.7)	0.117
Male	28 (23.3)	15 (30.6)	13 (18.3)	
Age group (years)				
18-29	14 (11.7)	6 (12.2)	8 (11.3)	0.102
30-49	66 (55.0)	32 (65.3)	34 (47.9)	
≥ 50	40 (33.3)	11 (22.4)	29 (40.8)	
Presence of psychosis	82 (68.3)	34 (69.4)	48 (67.6)	0.933
Comorbid axis I disorders	45 (37.5)	27 (55.1)	18 (25.4)	0.001
Polarity				
Positive	66 (55.0)	23 (51.1)	43 (62.3)	0.243
Negative	33 (27.5)	17 (37.8)	16 (23.2)	
None	15 (12.5)	5 (11.1)	10 (14.5)	
Rapid cycling	39 (32.5)	22 (51.2)	17 (25.0)	0.005
History of lithium use	109 (90.8)	43 (87.8)	66 (93.0)	0.353
Age of first episode (years)				
≥ 20	43 (35.8)	19 (38.8)	24 (33.8)	0.115
21-35	57 (47.5)	26 (53.1)	31 (43.7)	
≥ 36	20 (16.7)	4 (8.2)	16 (22.5)	
Number of episodes				
1-5	43 (35.8)	13 (26.5)	30 (42.3)	0.069
6-10	28 (23.3)	10 (20.4)	18 (25.4)	
≥ 11	49 (40.8)	26 (53.1)	23 (32.4)	
High impulsivity				
Attentional	58 (48.3)	35 (71.4)	23 (32.4)	< 0.001
Motor	57 (47.5)	29 (59.2)	28 (39.4)	0.033
Non-planning	58 (48.3)	34 (69.4)	24 (33.8)	< 0.001
Total	40 (33.3)	27 (55.1)	13 (18.3)	< 0.001
No permanent partner	76 (63.3)	28 (57.1)	48 (67.6)	0.242
No paid occupation*	87 (72.5)	39 (79.6)	48 (67.6)	0.148
Monthly income ≤ US\$ 210	84 (70.0)	37 (75.5)	47 (66.2)	0.274
Years of education				
≤ 9	26 (21.7)	13 (26.5)	13 (18.3)	0.557
10-12	41 (34.2)	16 (32.7)	25 (35.2)	
≥ 13	53 (44.2)	20 (40.8)	33 (46.5)	

Data presented as n (%).

* Unemployed subjects, homemakers, patients on sick leave, and those retired due to service time or disability.

history of SA (SA vs. no SA), impulsivity analysis yielded the following values: total impulsivity, 74.1 ± 15.2 vs. 62.4 ± 11.1 ($p < 0.001$); attentional impulsivity, 21.6 ± 3.7 vs. 18.5 ± 3.0 ($p < 0.001$); motor impulsivity, 24.2 ± 7.6 vs. 20.0 ± 5.6 ($p = 0.001$); non-planning impulsivity, 28.4 ± 6.3 vs. 24.0 ± 5.5 ($p < 0.001$).

At least one PD was diagnosed in 46 patients (38.3%) and SA was reported in 49 patients (40.8%), of whom 27 (22.5%) had attempted suicide with a non-violent method (ingestion of drugs/poisons, superficial cuts) and 22 (18.3%) with a violent method (using a firearm, jumping from height, igniting a fire, drowning, hanging). Twenty-one patients (17.5%) had attempted suicide once, 15 (12.5%) had made two attempts, and 13 (10.8%) had made three attempts or more.

On univariate analysis, there were statistically significant differences in eight clinical characteristics between patients with and without SA. The same analysis did not

show differences in sociodemographic characteristics (Tables 1 and 2).

After adjusting for covariables in multivariate analysis of all variables with $p < 0.20$, only cluster B PDs, high attentional impulsivity, and lack of paid occupation remained significantly associated with SA (Table 3).

The frequencies of axes I and II comorbidities are provided in Table 4.

Discussion

There exists a complex relationship between BD and SB, which is mediated by several factors. In this sample, 40.8% of individuals had attempted suicide at least once in their lifetime and more than 30% exhibited important markers of disease severity, including high levels of impulsivity (33.3%), comorbidity with other axis I disorders (37.5%),

Table 2 Frequency of PDs stratified by cluster in patients with type I bipolar disorder (n=120)

Presence of PD	Total (n=120)	Suicide attempt (n=49)	No suicide attempt (n=71)	p
Any PD	46 (38.3)	28 (57.1)	18 (25.4)	< 0.001
Cluster A	5 (4.2)	2 (4.1)	3 (4.2)	1.000
Cluster B	23 (19.2)	17 (34.7)	6 (8.5)	< 0.001
Cluster C	24 (20.0)	15 (30.6)	9 (12.7)	0.016
PD NOS	7 (5.8)	5 (10.2)	2 (2.8)	0.120

Data presented as n (%).

NOS = not otherwise specified; PD = personality disorder.

Numbers and percentages do not add up to total amounts because some subjects had more than one disorder.

Table 3 Multivariate analysis of factors associated with suicide attempts in the sample (n=120)

Variables	Crude OR	95%CI	p	Adjusted OR*	95%CI	p
Cluster B PDs	5.6	(1.7-18.7)	0.005	4.5	(1.3-15.3)	0.015
High attentional impulsivity	3.7	(1.4-10.0)	0.011	4.4	(1.6-11.7)	0.003
No paid occupation	3.6	(1.1-11.6)	0.033	4.0	(1.3-12.5)	0.015
High non-planning impulsivity	2.8	(1.1-7.5)	0.038	2.5	(0.96-6.5)	0.061

95%CI = 95% confidence interval; OR = odds ratio; PD = personality disorder.

* Values adjusted by variables that remained statistically significant and were carried forward into the multiple-factor model.

Table 4 Axis I and II comorbidities of patients with type I bipolar disorder (n=120)

Comorbidity	Total (n=120)	Suicide attempt (n=49)	No suicide attempt (n=71)
Axis I			
Alcohol abuse or dependence	10 (8.3)	6 (12.2)	4 (5.6)
Non-alcoholic substance dependence	5 (4.2)	4 (8.2)	1 (1.4)
Obsessive-compulsive disorder	10 (8.3)	7 (14.3)	3 (4.2)
Posttraumatic stress disorder	4 (3.3)	4 (8.2)	0 (0.0)
Generalized anxiety disorder	9 (7.5)	6 (12.2)	3 (4.2)
Anxiety disorder NOS	1 (0.8)	1 (2.0)	0 (0.0)
Social phobia	12 (10.0)	8 (16.3)	4 (5.6)
Specific phobia	10 (8.3)	4 (8.2)	6 (8.5)
Agoraphobia	5 (4.2)	4 (8.2)	1 (1.4)
Panic disorder	4 (3.3)	2 (4.1)	2 (2.8)
Eating disorder	1 (0.8)	1 (2.0)	0 (0)
Axis II			
Cluster A			
Paranoid	3 (2.5)	2 (4.1)	1 (1.4)
Schizoid	2 (1.7)	0 (0)	2 (2.8)
Schizotypal	0 (0)	0 (0)	0 (0)
Cluster B			
Antisocial	4 (3.3)	3 (6.1)	1 (1.4)
Borderline	10 (8.3)	9 (18.4)	1 (1.4)
Histrionic	10 (8.3)	6 (12.2)	4 (5.6)
Narcissistic	1 (0.8)	1 (2.0)	0 (0)
Cluster C			
Avoidant	11 (9.2)	8 (16.3)	3 (4.2)
Dependent	2 (1.7)	1 (2.0)	1 (1.4)
OCPD	14 (11.7)	8 (16.3)	6 (8.5)

Data presented as n (%). Numbers and percentages do not add up to total amounts because some subjects had more than one disorder. NOS = not otherwise specified; OCPD = obsessive-compulsive personality disorder; PD = personality disorder.

and rapid cycling (32.5%). Although the literature associates these markers with SA in bipolar patients, previous studies did not simultaneously evaluate the frequency of PDs in the same sample and under rigid euthymic criteria to minimize the influence of altered mood states on impulsivity and on the frequency of comorbid axis I and II disorders.

Indeed, when evaluated independently, significant associations were found between SA and severity markers

cited previously, as well as PDs. However, on multivariate analysis, only cluster B PDs, two impulsivity subscales (attentional and non-planning), and lack of paid occupation remained significantly associated with SA.

Our data reveal that cluster B PDs are associated with 4.5-fold higher odds of SA in patients with type I BD. This finding suggests that comorbidity with cluster B PDs may be one of the main predisposing factors of SA among patients with type I BD, which is consistent with a previous

study in which borderline and narcissistic PD were identified as independent risk factors for SA.¹⁷ These findings are understandable, given that subjects with cluster B PDs may be more predisposed to exposure to SB-precipitating factors due to severe self-instability and unstable interpersonal relationships.^{6,10,18} Although SB is included in the diagnostic criteria for borderline PD only, individuals with any cluster B PDs appear more inclined to experience stressful life events (e.g., ending a romantic relationship, social rejection, family conflicts, and loss of employment) that may trigger SA.¹⁸⁻²¹

It is important to note that other studies have reported that up to 41.2% of euthymic patients with BD present at least one comorbid PD. Regardless of symptomatic state, cluster B PDs are among the most frequent comorbidities in patients with BD, affecting up to 23% of patients evaluated during euthymia⁸ and approximately 30% of patients in whom symptomatic state was not strictly evaluated.²² Patients with BD evaluated during euthymia also exhibit high rates of comorbidity with other axis I disorders, with frequencies ranging from 27.3-31%.^{23,24} However, cluster B PDs may mimic signs and symptoms of axis I psychiatric disorders, such as impulsivity, suggestibility, chronic feelings of emptiness, mood swings, and histrionics, which may produce false diagnoses of axis I disorders. Given this predisposition and the fact that BD is highly comorbid with axis I and II disorders,^{8,24} we suppose that the association between axis I disorders and SA may be an artefact in studies that did not evaluate axis I and II comorbidities and impulsivity in the same sample. In addition, few studies have assessed impulsivity as a trait in euthymic patients with BD while controlling for various comorbidities. Another important point is that some common axis I comorbidities in patients with BD, such as anxiety disorders, drug addiction, and attention-deficit hyperactivity disorder (ADHD), are associated with high levels of impulsivity.²⁵⁻²⁷ Given this association, we can speculate that impulsivity in particular, rather than axis I disorder comorbidities in general, may be what drives the higher rates of SB in patients with BD.

Although impulsivity is considered a risk factor for SB, a recent study found no relationship between high impulsivity and SA in euthymic patients with BD.²⁸ In contrast, our data reveal a statistically significant association between high impulsivity (which was analyzed on a continuous and categorical basis) and SA, independent of PDs. However, multivariate analysis that used all categorical variables revealed an association between SA and attentional impulsivity subscales only, which is consistent with previous findings.²⁶ In turn, non-planning impulsivity showed a trend for association with SA after adjustment for covariables. This finding might be explained by distinct selection conditions and the smaller sample size of our study.

According to Swann et al.,²⁶ attentional impulsivity is higher during acute mood episodes. Coincidentally, the rate of SA in patients with BD is higher during depressive state and episodes with mixed features.³ Despite assessment in euthymic state, in our study, attentional impulsivity was associated with 4.4-fold higher odds of SA in bipolar patients. Attentional impulsivity, which is defined

as lack of self-control related to intolerance for minimal complexity and characterized by impatience and lack of flexibility,¹⁵ may be a trait in euthymic patients with BD and is intensified as a symptom during acute mood episodes, which may trigger SA. This is consistent with reports that SAs with a large impulsive component being brought about by seemingly unimportant triggers despite the use of violent methods.²⁶

In turn, non-planning impulsivity is associated with depressive episodes, which are important risk factors for SA.²⁶ Considering that non-planning impulsivity refers to a lack of a sense of the future¹⁵ and that, in this study, this type of impulsivity was initially associated with SA (crude OR = 2.81; $p = 0.038$), it is possible that non-planning impulsivity may also be a trait that predisposes an individual to SA. Furthermore, based on its definition, high impulsivity due to non-planning may impair therapeutic adherence and alliance, because patients with BD may fail to assess the consequences of BD and its long-term treatment adequately.^{28,29} Thus, this population would be even more predisposed to SA.

Motor impulsivity, which is associated with mania²⁶ and is a risk factor for violent behavior,³⁰ was not associated with SA in the present study. Existing evidence indicates that fewer suicides are attempted during manic episodes.³¹ Therefore, motor impulsivity does not appear to be associated with SA as a trait or state characteristic. Moreover, according to a recent review of impulsivity and suicidality in BD, SAs in patients with higher motor impulsivity tend to be less lethal.³²

Impulsivity is a trait associated with both BD and cluster B PDs.^{10,26} Therefore, the sum of these impulsive traits could work as an important trigger and increase individuals' exposure to SA-triggering factors. Consistent with this hypothesis, cluster A PDs (4.2%) and cluster C PDs (20%), which were the least and most frequent in our sample, respectively, do not present impulsivity as a diagnostic criterion, nor were they associated with SA in our study. In accordance with our findings, a recent study that evaluated a group of patients with BD and unipolar depression showed that cluster A PD comorbidity was not associated with lifetime SA, whereas cluster B PDs showed a significant association. In contrast, the authors found that presence of any comorbid PD and cluster C PD comorbidity were associated with lifetime SA.³³ These discordances may be explained by the methodological differences, such as evaluating different type of mood disorders in the same sample, not investigating impulsivity separately, and not using strict criteria for euthymia.

Additionally, some studies have reported that individuals with cluster B PDs exhibit greater inability to modulate emotional expression or maintain suitable behavior in the presence of intense negative affect,^{34,35} characteristics that have not been described for clusters A and C. This difficulty in emotional adjustment may lead to SB as well as to problems in the workplace. Thus, our results are consistent with other studies that have shown an association between SA and lack of a paid occupation.^{1,4} High levels of impulsivity, which are associated with SA, may also interfere with employability, as individuals with high attentional impulsivity may present impaired professional

performance due to impatience, inattention, inflexibility, and difficulty in dealing with complex problems. Furthermore, high non-planning impulsivity may lead these individuals to forgo thoughts about their future professional life. These factors would explain the association between SA, cluster B PDs, high attentional and non-planning impulsivity, and lack of a paid occupation.

The absence of other sociodemographic differences between patients with and without SA is unusual. However, as in our study, a recent systematic review found no significant associations between SA and age, marital status, or gender.³ In contrast, Schaffer et al.³⁶ showed a significant association between SA and female gender. It is worth noting that women were overrepresented in our sample (76.7%) compared to the general population. In fact, although several nationally representative surveys have found no significant gender differences in the prevalence of BD, many studies using a convenience sample show a higher frequency of the female gender. Therefore, we can suppose that the gender distribution within these clinical samples reflects gender differences in treatment-seeking behavior, rather than true differences in the gender prevalence of BD.³⁷ On the other hand, some clinical differences are well established between genders; namely, women with BD report significantly more disruptions in social/leisure life and family life and have a higher prevalence of mixed symptoms, depressive polarity, comorbidity with PD, and rapid cycling than men.^{38,39}

However, a previous study showed that patients with rapid cycling, independent of gender, are better able to adjust to work environments during periods of euthymia. Furthermore, those with rapid cycling did not exhibit a higher frequency of PDs or SA.⁴⁰ Similarly, although rapid cycling is a marker for BD severity and is associated with high levels of impulsivity, a previous study found no association between rapid cycling and SA,²⁸ which is consistent with the findings of the present study even after controlling for covariables. These findings suggest that the association between rapid cycling and SA found in some studies may be mediated indirectly by high impulsivity among those who exhibit rapid cycling.

In conclusion, patients with BD in this sample exhibited a high rate of SA (40.8%), which was associated mainly with the presence of comorbid cluster B PDs. High attentional impulsivity and lack of a paid occupation were independently associated with SA, suggesting that some clinical and social characteristics related to cluster B PDs may exacerbate SB in patients with BD. In addition, high non-planning impulsivity showed a trend toward association with SA; this factor might be considered in future studies with larger samples and novel experimental designs. Finally, preventing suicide is one of the main objectives of healthcare professionals who treat patients with BD. Understanding the factors that regulate the risk of suicide in BD, including PDs, impulsivity, and social determinants, may offer new alternatives to the design of therapeutic interventions to reduce morbidity and mortality due to SB. Further studies on the relationship between SB and PDs may broaden our understanding of this association and help reduce suffering and problems linked to BD.

Our sample was representative of the CETHA population, but the small sample size is a limitation of this study. Additional limitations include the cross-sectional design, which precluded identification of causal linkages between variables, and the fact that axis I disorders were grouped together into the same variable due to the small sample size, even though we know that some of these disorders are more related to SA than others. Additionally, failure to evaluate for ADHD, which is highly prevalent in patients with BD, may constitute an uncontrolled confounding variable in this study. Finally, we did not analyze the association between duration of mood episodes and SAs, did not distinguish between impulsive or premeditated SAs, and used only one instrument to assess impulsivity (BIS-11), all of which may be considered limitations.

Strengths of the study include that the psychiatric diagnosis and symptomatological state of our sample were highly homogeneous, as we only included patients with type I BD evaluated under strict criteria for euthymia. Furthermore, most of the patients were taking at least one mood stabilizer at the time of data collection, with 72.5% taking lithium, which minimizes the possible interference of different drug categories on the results.

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Disclosure

The authors report no conflicts of interest.

References

- Nock MK, Borges G, Bromet EJ, Cha CB, Kessler RC, Lee S. Suicide and suicidal behavior. *Epidemiol Rev.* 2008;30:133-54.
- Machado DB, Rasella D, Dos Santos DN. Impact of income inequality and other social determinants on suicide rate in Brazil. *PLoS One.* 2015;10:e0124934.
- Costa Lda S, Alencar AP, Nascimento Neto PJ, dos Santos Mdo S, da Silva CG, Pinheiro Sde F, et al. Risk factors for suicide in bipolar disorder: a systematic review. *J Affect Disord.* 2015;170:237-54.
- Pompili M, Gonda X, Serafini G, Innamorati M, Sher L, Amore M, et al. Epidemiology of suicide in bipolar disorders: a systematic review of the literature. *Bipolar Disord.* 2013;15:457-90.
- Jamison KR. Suicide and bipolar disorder. *J Clin Psychiatry.* 2000; 61:47-51.
- Tyrer P, Reed GM, Crawford MJ. Classification, assessment, prevalence, and effect of personality disorder. *Lancet.* 2015;385:717-26.
- Hawton K, van Heeringen K. Suicide. *Lancet.* 2009;373:1372-81.
- Bezerra-Filho S, Galvão-de-Almeida A, Studart P, Rocha MV, Lopes FL, Miranda-Scippa A. Personality disorders in euthymic bipolar patients: a systematic review. *Rev Bras Psiquiatr.* 2015;37:162-7.
- Links PS, Gould B, Ratnayake R. Assessing suicidal youth with antisocial, borderline, or narcissistic personality disorder. *Can J Psychiatry.* 2003;48:301-10.
- Pompili M, Ruberto A, Girardi P, Tatarelli R. Suicidality in DSM-IV cluster B personality disorders. An overview. *Ann Ist Super Sanita.* 2004;40:475-83.
- Young RC, Biggs JT, Ziegler VE, Meyer DA. A rating scale for mania: reliability, validity and sensitivity. *Br J Psychiatry.* 1978;133:429-35.
- Hamilton M. A rating scale for depression. *J Neurol Neurosurg Psychiatry.* 1960;23:56-62.
- First MB, Spitzer RL, Gibbon M, Williams JB. Structured Clinical Interview for DSM-IV Axis I Disorders Patient Edition SCID-I/P (Version 2.0). New York: Biometrics Research Department, New York State Psychiatric Institute; 1996.

- 14 First MB, Gibbon M, Spitzer RL, Williams JB, Benjamin L. Structured Clinical Interview for DSM-IV Axis I Personality Disorders (SCID-II). New York: Biometrics Research Institute, New York State Psychiatric Institute; 1997.
- 15 Patton JH, Stanford MS, Barratt ES. Factor structure of the Barratt impulsiveness scale. *J Clin Psychol.* 1995;51:768-74.
- 16 Stanford MS, Mathias CW, Dougherty DM, Lake SL, Anderson NE, Patton JH. Fifty years of the Barratt Impulsiveness Scale: An update and review. *Pers Individ Dif.* 2009;47:385-95.
- 17 Ansell EB, Wright AG, Markowitz JC, Sanislow CA, Hopwood CJ, Zanarini MC, et al. Personality disorder risk factors for suicide attempts over 10 years of follow-up. *Personal Disord.* 2015;6:161-7.
- 18 Bertolote JM, Mello-Santos Cd, Botega NJ. [Detecting suicide risk at psychiatric emergency services]. *Rev Bras Psiquiatr.* 2010;32:S87-95.
- 19 Blasco-Fontecilla H, Baca-Garcia E, Duberstein P, Perez-Rodriguez MM, Dervic K, Saiz-Ruiz J, et al. An exploratory study of the relationship between diverse life events and specific personality disorders in a sample of suicide attempters. *J Pers Disord.* 2010;24:773-84.
- 20 Oltmanns TF, Balsis S. Personality disorders in later life: questions about the measurement, course, and impact of disorders. *Annu Rev Clin Psychol.* 2011;7:321-49.
- 21 Powers AD, Gleason ME, Oltmanns TF. Symptoms of borderline personality disorder predict interpersonal (but not independent) stressful life events in a community sample of older adults. *J Abnorm Psychol.* 2013;122:469-74.
- 22 Garno JL, Goldberg JF, Ramirez PM, Ritzler BA. Bipolar disorder with comorbid cluster B personality disorder features: impact on suicidality. *J Clin Psychiatry.* 2005;66:339-45.
- 23 Nery-Fernandes F, Quarantini LC, Galvão-De-Almeida A, Rocha MV, Kapczinski F, Miranda-Scippa A. Lower rates of comorbidities in euthymic bipolar patients. *World J Biol Psychiatry.* 2009;10:474-9.
- 24 Vieta E, Colom F, Corbella B, Martinez-Aran A, Reinares M, Benabarre A, et al. Clinical correlates of psychiatric comorbidity in bipolar I patients. *Bipolar Disord.* 2001;3:253-8.
- 25 Del Carlo A, Benvenuti M, Fornaro M, Toni C, Rizzato S, Swann AC, et al. Different measures of impulsivity in patients with anxiety disorders: a case control study. *Psychiatry Res.* 2012;197:231-6.
- 26 Swann AC, Steinberg JL, Lijffijt M, Moeller FG. Impulsivity: differential relationship to depression and mania in bipolar disorder. *J Affect Disord.* 2008;106:241-8.
- 27 Prada P, Hasler R, Baud P, Bednarz G, Ardu S, Krejci I, et al. Distinguishing borderline personality disorder from adult attention deficit/hyperactivity disorder: a clinical and dimensional perspective. *Psychiatry Res.* 2014;217:107-14.
- 28 Etain B, Mathieu F, Liquet S, Raust A, Cochet B, Richard JR, et al. Clinical features associated with trait-impulsiveness in euthymic bipolar disorder patients. *J Affect Disord.* 2013;144:240-7.
- 29 Belzeaux R, Boyer L, Mazzola-Pomietto P, Michel P, Correard N, Aubin V, et al. Adherence to medication is associated with non-planning impulsivity in euthymic bipolar disorder patients. *J Affect Disord.* 2015;184:60-6.
- 30 Monahan J, Steadman HJ, Appelbaum PS, Robbins PC, Mulvey EP, Silver E, et al. Developing a clinically useful actuarial tool for assessing violence risk. *Br J Psychiatry.* 2000;176:312-9.
- 31 Tidemalm D, Haglund A, Karanti A, Landen M, Runeson B. Attempted suicide in bipolar disorder: risk factors in a cohort of 6086 patients. *PLoS One.* 2014;9:e94097.
- 32 Watkins HB, Meyer TD. Is there an empirical link between impulsivity and suicidality in bipolar disorders? A review of the current literature and the potential psychological implications of the relationship. *Bipolar Disord.* 2013;15:542-58.
- 33 Jylha P, Rosenstrom T, Mantere O, Suominen K, Melartin T, Vuoriolehto M, et al. Personality disorders and suicide attempts in unipolar and bipolar mood disorders. *J Affect Disord.* 2016;190:632-9.
- 34 Apfelbaum S, Regalado P, Herman L, Teitelbaum J, Gagliesi P. Comorbidity between bipolar disorder and cluster B personality disorders as indicator of affective dysregulation and clinical severity. *Actas Esp Psiquiatr.* 2013;41:269-78.
- 35 Scott LN, Stepp SD, Pilkonis PA. Prospective associations between features of borderline personality disorder, emotion dysregulation, and aggression. *Personal Disord.* 2014;5:278-88.
- 36 Schaffer A, Isometsa ET, Tondo L, H Moreno D, Turecki G, Reis C, et al. International Society for Bipolar Disorders Task Force on Suicide: meta-analyses and meta-regression of correlates of suicide attempts and suicide deaths in bipolar disorder. *Bipolar Disord.* 2015;17:1-16.
- 37 Mitchell PB, Johnston AK, Corry J, Ball JR, Malhi GS. Characteristics of bipolar disorder in an Australian specialist outpatient clinic: comparison across large datasets. *Aust N Z J Psychiatry.* 2009;43:109-17.
- 38 Robb JC, Young LT, Cooke RG, Joffe RT. Gender differences in patients with bipolar disorder influence outcome in the medical outcomes survey (SF-20) subscale scores. *J Affect Disord.* 1998;49:189-93.
- 39 Nivoli AM, Pacchiarotti I, Rosa AR, Popovic D, Murru A, Valenti M, et al. Gender differences in a cohort study of 604 bipolar patients: the role of predominant polarity. *J Affect Disord.* 2011;133:443-9.
- 40 Serretti A, Mandelli L, Lattuada E, Smeraldi E. Rapid cycling mood disorder: clinical and demographic features. *Compr Psychiatry.* 2002;43:336-43.