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FACTORS ASSOCIATED WITH SUICIDE ATTEMPTS IN PATIENTS WITH BIPOLAR DISORDER TYPE I

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SUMMARY

Background: *The aim of this study is to identify the risk factors that are associated with suicide attempts in patients with bipolar disorder type I.*

Subjects and methods: *This cross-sectional study was conducted with inpatients and outpatients with BD type I. Patients who met the study inclusion criteria (n=91) were evaluated in terms of sociodemographic variables, history of childhood trauma, comorbidity of adult attention deficit hyperactivity disorder and posttraumatic stress disorder, and the course of the disease. The patients were divided into two groups: those with a history of suicide attempts and those without a history of suicide attempts. The parameters of the study groups were compared with t and chi-square tests as appropriate. Logistic regression was used to identify the predictors of suicide attempt.*

Results: *Logistic regression analysis of the study parameters suggested that the number of major depressive episodes (odds ratio: 7.18; 95% confidence interval: 1.84-28) and history of emotional neglect (odds ratio: 1.83; 95% confidence interval: 1.15-2.90) were significant predictors of suicide attempt in patients with BD.*

Conclusion: *In BD type I patients with a history of suicide attempts, the number of depressive episodes and emotional neglect, a subtype of childhood traumas, were the most remarkable risk factors. Considering the frequency of depressive episodes during the course of the disease and assessing traumas including those in childhood may help predict future suicide attempts in patients with BD.*

Key words: *bipolar disorder- suicide- childhood trauma- posttraumatic stress disorder*

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INTRODUCTION

More than 90% of the people who have attempted suicide are known to have mental disorders (Rihmer et al. 2010). In this context, suicidal behavior is a common condition (frequent) in patients with bipolar disorder (BD) (Hayes et al. 2015, Costa Lda et al. 2015). As stated in a recent review, the suicide attempt rate in patients with BD is approximately 20-30 times more than that in the general population. Every year, approximately 0.4% of patients with BD commit suicide (Tondo et al. 2003). In BD, the ratio of suicide attempt to completed suicide is approximately 3:1 in contrast to the ratio of 30:1 in the general population (Tondo & Baldessarini 2000). This finding suggests high lethality of suicidal acts in patients with BD (Umamaheswari et al. 2014). Therefore, several studies have focused on understanding the risk factors of suicide attempt in patients with BD.

The risk factors associated with suicide attempt in patients with BD may be grouped into three main categories: the sociodemographic characteristics of the case, the course of the disorder, and the presence of a comorbidity. The sociodemographic characteristics are the following: young age, being single, low level of education, substance abuse and childhood trauma (Galfalvy et al. 2006, Leverich et al. 2003, Simon et al. 2007). The family and social environment-related risk factors include family history of suicide, lack of social support mechanisms, professional and interpersonal relationship problems and family history of mood disorders (Hawton et al. 2005, Bryant 2013, McIntyre et al. 2008). Childhood trauma generally was associated with emotional, sexual, and physical abuse, including neglect. Moreover, robust research has emphasized that childhood trauma is a known predictor of suicidal behavior (Sarchiapone et al. 2007). The association between childhood trauma and lifetime suicide attempts has been demonstrated in patients with BD (McIntyre et al. 2008, Garno et al. 2005). Early onset, increasing number and longer duration of depressive episodes, increasing severity of affective episodes, presence of mixed episodes, and rapid cycling are associated with suicide attempts (Hawton et al. 2005, Leverich et al. 2003). Suicidal behavior is particularly associated with severe depressive and mixed episodes in early stages of the disorder. Therefore, previous studies have particularly focused on the relationship between suicide attempt and recurrent episodes of severe depression (Tondo et al. 2003, Schaffer et al. 2015). A growing amount of studies have examined comorbidity, especially anxiety disorder, as a risk factor for suicide attempts in patients with BD

(Simon et al. 2007, Goes 2015). Comorbidity with post-traumatic stress disorder leads to mood liability (anger, impulsivity and mood episodes) and social isolation. These factors may increase the risk of suicide in patients with BD (Otto et al. 2004). With comorbidity of adult attention deficit hyperactivity disorder, impulsivity and aggression may be accentuated, which is a risk factor for suicide attempt (James et al. 2004).

The review of the current literature reveals that studies investigating the factors likely to predispose patients with BD type I to suicide attempts often address the causes of suicide from one single aspect (Otto et al. 2004, James et al. 2004). Because few studies have evaluated the several possible risk factors for suicidal ideations in patients with BD type I, there is a need for further studies. Being aware of as many factors that may predispose the sufferers to suicide attempts as possible and studying them in detail may increase the predictability of the risk of suicide attempts. In the present study, we attempted to assess risk factors, such as sociodemographic characteristics, the course of the disease, and lifetime PTSD and ADHD comorbidities, for suicide attempt in patients with BD type I.

SUBJECTS AND METHODS

Subjects

This cross-sectional study was conducted with inpatients and outpatients with BD type I at the psychiatric departments of two university hospitals in which the researchers were employed. Before starting the study, approval was granted by the Human Research Ethics Committee of the university. All of the patients treated between February 2014 and April 2014 were asked to participate in the study, and all of the volunteers were included in the study after obtaining their written informed consent. The presence of an Axis I comorbidity (except ADHD and lifetime PTSD) and mental retardation were the exclusion criteria. The participants were divided into two groups: with and without a history of suicide attempt.

Measures

The patients who agreed to participate in the study were administered the Turkish version 5.00 of the MINI (Mini International Neuropsychiatric Interview) to confirm their diagnosis. A form designed by the researchers was used to collect sociodemographic variables (age, gender, marital status, educational level, employment status, place of residence, household, family history of BD, and history of substance use) and clinical variables (history of lifetime suicide attempt; duration of the disorder; number of depressive, manic, hypomanic, and mixed episodes; presence of rapid cycling; early onset of the disorder; and psychotic features). Data on this form were gathered from the patient and at least one first-degree relative and supported by the data in the patient files. To evaluate ADHD and PTSD, the MINI was used. Patients were asked to complete the Childhood Trauma Questionnaire (CTQ). All these instruments were conducted when the patients were in their euthymic phase.

Mini International Neuropsychiatric Interview (MINI): Clinician's evaluation-adaptation 5.0.0: This instrument was developed by Sheehan et al. (1998) to assess the major Axis I psychiatric disorders in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) and the International Statistical Classification of Diseases and Related Health Problems (ICD-10). It was designed as a short-structured interview. Engeler (2004) developed the Turkish version.

Childhood Trauma Questionnaire (CTQ): Bernstein et al. (1994) developed this questionnaire. It is useful to quantitatively and retrospectively assess the history of abuse and neglect before the age of 20. The scale consists of 28 items, three of which measure minimization of trauma. It is a 5-point Likert-type scale (1 = never, 2 = seldom, 3 = sometimes, 4 = often, 5 = very often). The scores obtained from the childhood sexual, physical, emotional abuse and emotional and physical neglect subscales and the total score composed of the scores of these five subscales are assessed. The reliability and validity study of the Turkish version of the scale was conducted by Sar & Ozturk (2012).

Statistical Analysis

The data are presented as the mean ± SD and percentage. Comparison of the study group parameters was performed with t and chi-square tests as appropriate. Logistic regression was used to identify the predictors of suicide attempt. The predictors included in the logistic regression analysis were age; gender; marital status; education level; employment status; place of residence; household; substance use; family history of BD; comorbidity of ADHD and PTSD; history of emotional abuse, emotional neglect, physical abuse, physical neglect, and sexual abuse; number of major depressive, manic, hypomanic, and mixed episodes; duration of the disorder; and the presence of rapid cycling, early onset of the disorder, and psychotic features. The level of significance was a p value less than 0.05. We used IBM SPSS Statistics version 22 (IBM Corp., Armonk, NY, USA) for statistical analysis.

RESULTS

Thirty patients had a history of suicide attempts. The proportions of patients with and without a history of lifetime suicide attempt were 33% and 67%, respectively. Table 1 presents the selected sociodemographic characteristics of patients with and without a history of suicide attempt. There was no difference between the study groups in terms of sociodemographic characteristics, including age, gender, marital status, educational status, employment status, place of residence, household, history of substance use, and family history of BD ($p>0.05$).

Table 1. Sociodemographic characteristics of patients with bipolar disorder I according to presence of history of suicide attempt

	History of Suicide Attempt		Total (n=91)	χ^2 or t value	Significance
	Absent (n=61) (67%)	Present (n=30) (33%)			
Age (Years)	38.8±12.4	37.3±10.2	38.3±11.7	0.560	0.560
Gender					
Female	23 (37.7%)	17 (56.7%)	40 (44.0%)	2.935	0.087
Male	38 (62.3%)	13 (43.3%)	51 (56.0%)		
Marital Status					
Married	25 (41.0%)	14 (46.7%)	39 (42.9%)	1.203	0.752
Single	28 (45.9%)	11 (36.7%)	39 (42.9%)		
Divorced	5 (8.2%)	4 (13.3)	9 (9.9%)		
Widow/Widower	3 (4.9%)	1 (3.3%)	4 (4.4%)		
Education Level					
Elementary school	24 (40%)	7 (22.6%)	31 (34.0%)	4.846	0.183
Junior high school	8 (11.7%)	5 (16.1%)	13 (14.3%)		
Senior high school	16 (26.7%)	15 (48.4%)	31 (34.0%)		
University	13 (21.7%)	3 (12.9%)	16 (17.6%)		
Employment Status					
Unemployed	34 (55.7%)	21 (70.0%)	55 (60.4%)	1.711	0.255
Employed	27 (44.3%)	9 (30.0%)	36 (39.6%)		
Place of residence					
Village	18 (29.5%)	6 (20.0%)	24 (26.4%)	1.162	0.559
Town	12 (19.7%)	8 (26.7%)	20 (22.0%)		
City	31 (50.8%)	16 (53.3%)	47 (51.6%)		
Household					
Spouse-children	29 (47.5%)	11 (36.7%)	40 (44.0%)	5.243	0.263
Parents or siblings	27 (44.3%)	15 (50.0%)	42 (46.2%)		
Alone	5 (8.2%)	4 (13.3%)	9 (9.8%)		
Substance use					
No	56 (91.8%)	24 (80.0%)	80 (87.9%)	2.636	0.168
Yes	5 (8.2%)	6 (20%)	11 (12.1%)		
Family history of BD					
No	54 (88.5%)	24 (80.0%)	78 (85.7%)	0.342	0.342
Yes	7 (11.5%)	6 (20.0%)	13 (14.3%)		

The data are presented as the mean ± SD and percentages. The data were compared using the chi-square (χ^2) test and Student's t-test.

Table 2 presents the results of the administered scales and selected clinical findings of the study population. The MINI revealed that in the patients with a history of suicide attempt, there was an increase in the rate of PTSD comorbidity (26.7% and 6.6%, respectively; $p<0.05$) but not in the ADHD comorbidity (33.3% and 16.4%; $p>0.05$). The mean subscale score of emotional neglect in the patients with a history of suicide attempt was significantly higher than that in the patients without a history of suicide attempt (13.4±3.4 and 11.0±4.1, respectively; $p<0.05$). The mean scores for the emotional abuse, physical abuse, physical neglect, and sexual abuse subscales were similar between the study groups ($p>0.05$). The mean number of major depressive episodes was significantly higher in patients with a history of suicide attempt than that in patients without a history of suicide attempt (2.6±1.7 and 1.0±1.4, respectively; $p<0.05$). The mean numbers of manic, hypomanic, and mixed episodes were similar between the study groups ($p>0.05$). The mean scores for the early onset of the disorder (<18 years), psychotic features, and the duration of the disorder were similar between the study groups ($p>0.05$).

Logistic regression analysis of the study parameters listed in Tables 1 and 2 suggested that the number of major depressive episodes (odds ratio: 7.18; 95% confidence interval: 1.84-28) and history of emotional neglect (odds ratio: 1.83; 95% confidence interval: 1.15-2.90) were significant predictors of suicide attempt in patients with BD. The full model containing all predictors was statistically significant ($p<0.05$), and considering that the possible R2 value needs to be a maximum of 50%, Nagelkerke R2 was calculated as 0.350. The model correctly classified 73.6% of cases with suicide attempt.

DISCUSSION

In this study, we attempted to identify the possible risk factors related to suicide attempt among patients with BD. Approximately one-third of the cases had a history of at least one suicide attempt. The present study revealed that the number of major depressive episodes is the most important predictor of suicide attempt. The relationship of history of emotional neglect was also assessed. Socio-demographic and clinical features,

Table 2. Clinical characteristics of patients with bipolar disorder I according to presence of history of suicide attempt

	History of suicide attempt		Total (n=91)	χ^2 or t value	Significance
	Absent (n=61) (%67)	Present (n=30) (%33)			
MINI					
With ADHD	10 (%16.4)	10 (%33.3)	20 (%22.0)	3.365	0.067
Without ADHD	51 (%83.6)	20 (%66.7)	71 (%78.0)		
With PTSD	4 (%6.6)	8 (%26.7)	12 (%13.2)	7.104	0.017
Without PTSD	57 (%93.4)	22 (%73.3)	79 (%86.8)		
CTQ					
Emotional abuse	8.0±3.8	8.7±3.8	8.2±3.7	0.867	0.389
Emotional neglect	11.0±4.1	13.4±3.4	11.8±4.0	2.838	0.006
Physical abuse	6.7±3.7	6.4±3.4	6.6±3.6	0.356	0.723
Physical neglect	8.5±3.0	9.0±2.7	8.6±3.0	0.652	0.516
Sexual abuse	5.6±1.6	6.3±3.1	5.8±2.2	1.301	0.197
Number of episodes					
Major depressive episodes	1.0±1.4	2.6±1.7	1.5±1.7	0.560	0.001
Manic episodes	1.9±3.1	4±1.2	4.4±4.7	0.789	0.432
Hypomanic episodes	1.9±3.1	2.1±4.1	1.9±3.4	0.234	0.815
Mixed episodes	0.2±0.6	0.1±0.4	0.2±1.7	1.000	0.316
Rapid Cycling					
No	56 (%91.8)	28 (%93.3)	84 (%92.3)	0.066	1.000
Yes	5 (%8.2)	2 (%6.2)	7 (%7.7)		
Early onset of the disorder (<18 years)					
No	11 (%18.0)	8 (%26.7)	19 (%20.9)	0.907	0.341
Yes	50 (%82.0)	22 (%73.3)	72 (%79.1)		
Psychotic features					
No	39 (%63.9)	24 (%80.0)	63 (%69.2)	2.437	0.119
Yes	22 (%36.1)	6 (%20.0)	28 (%30.8)		
Duration of the disorder (days)	4035.3±3669.8	4376.7±3152.8	4147.8±3493.9	0.436	0.664

The data are presented as the mean ± SD and percentages. The data were compared using the chi-square (χ^2) test and Student's t-test.

including age; gender; marital status; education; employment status; place of residence; household; history of substance use; family history of BD; presence of rapid cycling, early onset of the disorder, and psychotic features; duration of the disorder; number of manic, hypomanic and mixed episodes; and subtypes of childhood trauma, except emotional trauma, were not related to risk of suicide attempt in our study population.

Among the mental disorders, BD has the strongest relationship with suicide attempt (Chen & Dilsaver 1996). Chen & Dilsaver (1996) stated that patients with BD attempt suicide two times more often than those with unipolar disorder and 6.2 times more often than the control group. Regarding the type of the BD episodes, suicidal intent was significantly increased by the severity of depression during the depressive episodes or mixed episodes (Valtonen et al. 2007). Chaudhury et al. (2007) emphasized the importance of the number of lifetime depressive episodes in suicide attempts. In a study of patients with BD, manic episodes were indicated to be less risky in terms of suicide attempts (Grunebaum et al. 2001). A reason why suicide attempts occur less often during manic episodes might be due to grandiose delusions occurring during the manic episodes. Grandiose optimism, or presence of less despair, can be another factor leading to fewer suicides during this period. Thus, Grunebaum et al. (2001) reported that the absence of desperation might account for fewer suicides during manic episodes. The association between suicide attempt and the number of depressive episodes found in this study is in accordance with the findings of the studies mentioned above. This evidence supports that the association of suicide attempt and number of depressive episodes of BD needs to be considered in psychiatric practice.

The effect of childhood trauma on various mental disorders has not been fully understood, and its effect on the clinical course of BD is thought to be important (Watson et al. 2013). Garno et al. (2005) reported that half of the BD patients had a history of severe childhood trauma. They also stated that this proportion was higher than that in the general population. Etain et al. (2008) stated that childhood trauma, particularly emotional and sexual abuse, increased the frequency of suicidal behaviors in BD patients. Watson et al. (2013) conducted a study with 60 BPD patients and 55 healthy individuals and found a significant difference between the two groups in terms of emotional neglect. Emotional neglect can lead to affect dysregulation during childhood (Dvir et al. 2014). Affect dysregulation is a factor that increases the tendency to attempt suicide (Capron et al. 2013). In the current study, the history of

emotional neglect was associated with history of suicide attempt. This finding suggests that clinicians should conduct detailed assessments of emotional neglect history during the intake process or when patients are completing their sociodemographic histories.

This study has limitations that must be considered. First, this study used a cross-sectional design that cannot evaluate casual relationships. A longitudinal study design would be beneficial. Second, childhood trauma data were evaluated from a self-report questionnaire. However, CTQ was completed while the patients were in their euthymic phase. Additionally, in a longitudinal assessment, there is a good reliability to evaluate childhood trauma in patients with severe mental disorders (Goodman et al. 1999). In the current study, in contrast to previous studies (Carballo et al. 2015, Carrà et al. 2014, Carrà et al. 2015, Garcia-Amador et al. 2009, Lan et al. 2015), the comorbidity of ADHD and PTSD, the history of substance use, the family history of BD, the presence of psychotic features and rapid cycling were not risk factors for suicide attempt in patients with BD. We believe that this finding may be related to the small size of the sample, including BD cases with and without a history of suicide attempts, based on the number of parameters investigated in the study. If a sample is small, the study results may not be generalizable. Also the lack of information on pharmacological treatment in our study is a further limitation. Cipriani et al. (2013) reported that mood stabilizers is important to prevent risk of suicide among individuals with BD. Considering these limitations, we recommend that future studies should be designed as prospective studies with a larger number of cases and a longer follow-up period. The present study is important because it is one of the few studies that has addressed factors that predispose BPD patients to suicide attempts from various aspects. Another striking feature of this study is that it included the history of childhood trauma within the scope of the sociodemographic variables. The inclusion of this factor is a strength of our study.

CONCLUSIONS

In conclusion, in BD patients with a history of suicide attempts, the number of depressive episodes and emotional neglect, a subtype of childhood trauma, are the most remarkable risk factors. Considering the frequency of depressive episodes during the course of the disease and assessing traumas including childhood trauma may help predict future suicide attempts in patients with BD.

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