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Family history of suicidal behavior and early traumatic experiences: additive effect on suicidality and course of bipolar illness?

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Abstract

Background—Bipolar Disorder (BD) is associated with a high prevalence of suicide attempt and completion. Family history of suicidal behavior and personal history of childhood abuse are reported risk factors for suicide among BD subjects.

Methods—BD individuals with family history of suicidal behavior and personal history of childhood abuse (BD-BOTH), BD individuals with family history of suicidal behavior or personal history of childhood abuse (BD-ONE), and BD individuals with neither of these two risk factors (BD-NONE) were compared with regard to demographic variables and clinical measures.

Results—Almost 70% of the sample had a history of a previous suicide attempt. There were significantly higher rates of previous suicide attempts in the BD-BOTH and BD-ONE relative to the BD-NONE group. BD-BOTH were significantly younger at the time of their first suicide attempt and had higher number of suicide attempts compared with BD-NONE. BD-BOTH were significantly younger at the time of their first episode of mood disorder and first psychiatric hospitalization and had significantly higher rates of substance use and borderline personality disorders compared to BD-NONE.

Limitations—Retrospective study. Used of semi-structured interview for the assessment of risk factors.

Conclusions—BD individuals with a familial liability for suicidal behavior and exposed to physical and/or sexual abuse during childhood are at a greater risk to have a more impaired course of bipolar illness and greater suicidality compared to those subjects with either only one or none of these risk factors. Prospective studies are needed to confirm these findings.

Keywords

child abuse; suicide; family history; bipolar disorder; trauma

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INTRODUCTION

Bipolar Disorder (BD) is associated with high prevalence of suicide attempt and completion (Chen and Dilsaver, 1996; Goodwin and Jamison, 1990; Jamison, 2000; Tsai et al., 1999; Galfalvy et al., 2006) and suicide accounts for as much as 19% of deaths in BD patients (Goodwin and Jamison, 1990). Many retrospective studies and a handful prospective studies have identified major suicide risk factors in BD. Family history of suicidal behavior (Galfalvy et al., 2006; Hawton et al., 2005; Slama et al., 2004), personal history of childhood abuse (Garno et al., 2005; Leverich et al., 2002; Leverich et al., 2003) and comorbid anxiety disorders (Dilsaver et al, 2006, Simon et al, 2007, a, b) are important examples of these risk factors, although not all data are consistent (Nakagawa et al., 2007).

Adoption, twin and family studies show that suicidal behavior runs in families (Brent and Mann, 2005; Goodwin and Jamison, 2007, Brent et al., 2002; Brent et al., 2003). In general, relatives of suicide completers are at high risk for both attempted and completed suicide (Brent et al., 2002) and this has also been found in BD (Tsai et al., 2002; Tsai et al., 1999). Earlier age of onset of affective disorders, aggressive/impulsive traits, and a history of childhood abuse in probands with affective disorders is associated with risk for suicidal behavior in offspring (Mann et al., 2005). Whether this is the case specifically for BD individuals has not yet been studied.

Nearly half of adult patients with BD report a history of severe physical, sexual or combined childhood abuse (Brown et al., 2005; Garno et al., 2005; Goldberg and Garno, 2005; Leverich et al., 2002; Leverich et al., 2003; Leverich and Post, 2006). BD patients with a history of childhood abuse were shown to have earlier age of onset of bipolar illness, greater axis I, II, and III comorbidities, and, remarkably, increased rates of suicide attempts (Brown et al., 2005; Garno et al., 2005;Goldberg and Garno, 2005; Leverich et al., 2002; Leverich et al., 2003).

Given that liability to suicidal behavior seems to run in families as a trait transmitted independently of psychiatric disorders (Brent and Mann, 2005) and childhood abuse is associated with higher rates of suicide attempts in BD individuals (Post and Leverich, 2006), it would be important to determine if having a family history of suicidal behavior and/or having experienced personal history of childhood abuse would increase risk for suicidal behavior for those with BD. To the best of our knowledge, no study to date has evaluated the effect of concomitant family history of suicidal behavior and childhood abuse on suicidality and course of illness among bipolar subjects. We hypothesized an additive effect for family history of suicidal behavior and childhood abuse among BD individuals.

METHODS

Participants

Participants in this study included 168 BD patients who participated in a mood disorder research program at two university hospitals, one in Pittsburgh (13.1% of the sample) and one in New York at New York State Psychiatric Institute (NYSPI; 86.9% of the sample). Bipolar patients were in a depressive or mixed episode at the time of study in order to equate the groups with respect to clinical state. Subjects had a physical examination and routine laboratory screening tests, including urine and blood toxicological screenings to rule out neurological or medical illness.

Instruments

DSM-III-R Axis I and Axis II disorders were diagnosed using the Structured Clinical Interview (SCID) (Spitzer et al., 1990). Measures of lifetime aggression (Brown and

Goodwin, 1986), impulsivity (Barratt, 1965), and hostility (Buss and Durkee, 1957) were used. We also measured current hopelessness (Beck et al., 1974), reasons for living (Linehan et al., 1983), and life stressors (Oquendo et al., 2003). A history of childhood physical or sexual abuse before the age of 15, and a family history of suicidal behavior (only first-degree relatives were included) were rated as present or absent based on self-report during the interview. Family history of substance use disorders and affective disorders were also rated as present or absent based on the Family History RDC Inventory (Andreasen et al, 1977).

A suicide attempt was defined as a self-destructive act that was committed with at least some intent to end one's life. This definition has proven useful in previously published cross-sectional studies (Dilsaver et al., 2005, Dilsaver et al., 2006). A lifetime history of all suicide attempts, including number of attempts and the method and degree of medical damage for each attempt, was recorded on the Columbia Suicide History Form (Oquendo et al., 2003). Current suicidal ideation (Beck et al., 1979), degree of medical damage caused by each suicide attempt (Beck et al., 1975), and suicide intent Beck et al., 1974) were measured. Inter-rater agreement and intra-class coefficients were good to excellent (≥ 0.70).

Procedures

Bipolar patients were recruited from emergency rooms, depression research clinics and referrals for outpatient treatment. The study was approved by the Institutional Review Board at each site and written informed consent was obtained from all participants prior to beginning the study. Clinical assessments were conducted by masters or PhD-level psychologists.

Statistical analysis

Given the small number of BD non-suicide attempters with both risk factors, we were unable to conduct ANOVA analyses with interactions. Therefore, we decided to compare individuals with only one of the risk factors to determine if they could be grouped together. BD individuals with a family history of suicidal behavior but not a personal history of childhood abuse did not differ significantly from those BD individuals with a personal history of childhood abuse but not a family history of suicidal behavior (data not shown) on any of the measures used. Therefore, we grouped together all these individuals and defined this group as BD individuals with only one risk factor. We then conducted analyses with three derived groups: BD individuals with two risk factors (family history of suicidal behavior and personal history of childhood abuse) (BD-BOTH), BD individuals with only one risk factor (family history of suicidal behavior or personal history of childhood abuse) (BD-ONE), and BD individuals with neither of these two risk factors (BD-NONE). Demographic and clinical characteristics of the three groups of BD individuals were compared using ANOVA and chi-square test as appropriate. Post-hoc analyses were conducted using Tukey or Chi-square tests as appropriate. While we did not correct for multiple comparisons because of the relatively small sample size, lack of power and exploratory nature of the study, Bonferroni corrections if applied to control for multiple comparisons for demographic, suicidality, course of illness, and family history of psychiatric disorders variables would have the significance levels set at $p < 0.008$ for the 6 demographic variables, $p < 0.007$ for the 7 suicidality variables, $p < 0.005$ for the 10 course of illness and clinical variables, and $p < 0.016$ for the 3 family psychiatric history variables. The actual calculated p-values are presented for the reader to evaluate the findings.

RESULTS

Demographic parameters

Demographic variables are presented in Table 1. BD-BOTH, BD-ONE, and BD-NONE individuals did not differ in terms of demographic characteristics. The majority of all three groups were white females, the average age was in the mid- thirties, most participants had a high school diploma, 75% or more had never been married and the sample was primarily in the low-income range.

Suicidality

Almost 70% of the sample had a history of a previous suicide attempt (Table 1). Slightly more than 56% of the BD-NONE, 79.4% of the BD-ONE, and 90% of the BD-BOTH had attempted suicide. There were significantly higher rates of previous suicide attempts in the BD-BOTH and BD-ONE relative to the BD-NONE group. The rates of previous suicide attempts did not differ between BD-BOTH and BD-ONE groups. Among the childhood/adolescent onset group, all individuals of the BD-BOTH group, 91.9% of the BD-ONE group, and 69.9% of the BD-NONE group had attempted suicide. There were significantly higher rates of previous suicide attempts in the BD-BOTH and BD-ONE with a childhood/adolescent onset of illness relative to the BD-NONE group. There were no differences in rates of prior suicide attempts in the BD-BOTH and BD-ONE groups.

BD-BOTH suicide attempters were significantly younger at the time of their first suicide attempt and were more likely to be teenagers compared with BD-NONE suicide attempters but did not differ significantly from BD-ONE suicide attempters. There were no differences in age at first suicide attempt between BD-ONE and BD-NONE suicide attempters.

BD-BOTH and BD-ONE suicide attempters did not differ significantly in the number of previous suicide attempts, but had a significantly higher number of suicide attempts compared to BD-NONE suicide attempters.

The BD-BOTH group had higher scores on the suicidal ideation scale compared to BD-ONE and BD-NONE group. BD-ONE and BD-NONE individuals did not differ significantly in their suicidal ideation scores.

Course of illness and clinical characteristics

BD-BOTH group was significantly younger at the time of their first episode of mood disorder compared with BD-NONE group. The BD-ONE group did not differ significantly from either the BD-BOTH or the BD-NONE group with regard to age of onset of bipolar illness (Table 1).

BD-BOTH group was significantly younger at the time of their first psychiatric hospitalization compared with BD-NONE group and the BD-ONE group was not significantly different from either the BD-BOTH or the BD-NONE.

BD-BOTH group had significantly higher impulsivity scores compared to BD-NONE group whereas BD-ONE and BD-NONE group did not significantly differ with respect to impulsivity scores. The BD-BOTH group also had significantly higher aggression scores than BD-NONE group. Hostility scores were not statistically different between groups.

Current reasons for living scale scores were significantly lower among BD-BOTH and BD-ONE groups than BD-NONE. BD-BOTH and BD-ONE groups did not differ with regards to the number of reported reasons for living. The number of stressful life events reported and the hopelessness scores measured were not different between groups.

The BD-BOTH group have a higher prevalence of SUD and BPD than BD-NONE group. Similarly, BD-ONE group had higher prevalence of SUD and BPD compared to BD-NONE individuals. The prevalence of each of these disorders did not differ significantly between BD-BOTH and BD-ONE individuals.

Family history of psychiatric disorders

BD-BOTH and BD-ONE group have a higher prevalence of first-degree relatives with a history of an affective disorder than BD-NONE group (80.0% vs 44.9%; 65.2% vs 44.9%, respectively) (χ^2=10.80, df=2, p=0.005).

There was a higher prevalence of a family history of alcohol use disorder between BD-BOTH and both BD-ONE and BD-NONE groups (70.0% vs 43.9%; 70.0% vs 24.4%, respectively) (χ^2=15.87, df=2, p<0.001). Similarly, a higher prevalence of drug use disorders among first-degree relatives was found between BD-BOTH group compared to BD-NONE group (40.0% vs 12.8%) (χ^2=7.69, df=2, p=0.021).

DISCUSSION

Suicidality, childhood abuse, and family history of suicidal behavior

This sample had a high proportion of suicide attempters (69.9%). Despite this, a significant difference on the prevalence of suicide attempters was found between groups. BD-BOTH group had the highest prevalence of suicide attempters with 90% of the subjects belonging to this group being suicide attempters. Separate analyses also indicated that among individuals of the BD-BOTH group who had their first episode of the mood disorder before age 18, all were suicide attempters, underscoring the high vulnerability of this group for displaying suicidal behavior, especially if bipolar illness has an early onset. Conversely, approximately half of the individuals of the BD-NONE group were also suicide attempters, which clearly indicates that other factors aside of family history of suicidal behavior and personal history of childhood abuse influence the occurrence of suicidal behavior among bipolar subjects. Although we were unable to show a significant difference between BD-BOTH group and BD-ONE group with regards to the prevalence of suicide attempters, our results suggest that family history of suicidal behavior and personal history of childhood abuse may act in an additive or synergistic fashion. Roy and Janal (2005) studied the potential interaction of family history of suicide and childhood trauma in a sample of abstinent substance dependent patients and showed that these variables were independent, and non-interacting risk factors for attempting suicide. Further studies with larger samples that allow for the comparisons of the four groups may shed light on the relationships and interactions of these variables in bipolar subjects. Individuals of the BD-BOTH group were the youngest at the time of their first suicide attempt and had attempted suicide more frequently than the other two BD groups, although the lethality of attempts did not differ. In addition, measures related to suicidal behavior such as Reasons For Living and Suicidal Ideation Scale scores showed that BD-BOTH subjects reported the most severe scores. These findings, if replicated, would be a strong indicator of the urgent task of implementing preventive interventions targeted to BD individuals who have a genetic loading of suicidal behavior and/or have been exposed to the familial modeling of suicidal behavior and have suffered early traumatic experiences such as childhood abuse.

Course of illness, childhood abuse and family history of suicidal behavior

Age of onset and illness progression—Our results suggest an additive or synergistic effect of both risk factors (family history of suicidal behavior and history of childhood abuse) on the course of bipolar illness. Previous investigations have shown that adults with BD who reported childhood physical or sexual abuse were younger at the onset of bipolar

illness and experienced a more impaired course of illness compared to those BD individuals who did not report such early traumatic experiences (Brown et al., 2005; Garno et al., 2005; Goldberg and Garno, 2005; Leverich et al., 2002; Leverich and Post, 2006; Post and Leverich, 2006). Conversely, Kessing et al. (2004) indicated that the death of a first degree relative due to suicide is an important stressor significantly related to the onset of a first manic episode.

Clinical characteristics—BD-BOTH individuals had the highest impulsivity and aggressiveness scores. BD-BOTH individuals were significantly more impulsive than the two other groups, which suggest the uniqueness of this more impaired subgroup of BD individuals. A similar trend was observed with regards to aggressiveness scores.

Comorbid psychiatric disorders—Our results show that the prevalence of SUD and BPD progressively increase according to the number of risk factors. Previous investigations have shown that BD individuals with childhood physical or sexual abuse developed more Axis I, II, and III comorbidities, including alcohol and substance use disorders, than their counterparts without childhood abuse (Post and Leverich, 2006). However, none of these investigations explored the impact of having a family history of suicidal behavior concurrently.

Family history of psychiatric disorders

Family history of affective disorder—BD-BOTH and BD-ONE individuals had a higher prevalence of affective disorders in first-degree relatives than BD-NONE individuals. Here, the presence of any of these risk factors needs to be explored in all bipolar subjects and especially when evaluating BD individuals with first-degree relatives of affective disorders. Families with at least one bipolar parent have been reported to show less cohesion and organization, and more conflict (Chang et al., 2001), and to have more difficulties communicating effectively (Romero et al., 2005), which could be related to the occurrence of childhood abuse but also suicidal behavior in first degree relatives.

Family history of alcohol or drug use disorder—BD-BOTH had the highest rates of first-degree relatives with alcohol and drug use disorders. Our results are in agreement with previous investigations that showed that parents who abuse their children are more likely to be suicide attempters as well as to have affective and substance use disorders (Chaffin et al., 1996; Roberts and Hawton, 1980; Baca-Garcia et al., 2007, a,b).

Limitations

Several limitations require consideration. The presence or absence of a family history of suicidal behavior in first-degree relatives and the presence or absence of childhood physical and/or sexual abuse were determined by semi-structured interview during the evaluation of other demographic data. The information provided by some subjects was not confirmed using other informants. The retrospective nature of the ascertainment was subject to recall bias and may have led to underreporting early traumatic experiences and/or family history of suicidal behavior. In addition, other forms of abuse or neglect were not addressed. Similarly, family history of suicidal behavior was considered categorical. However, these methodological limitations would decrease rather than increase the likelihood of finding group differences. The sample size was moderately small, especially in the BD-BOTH group, which could have contributed to diminishing our statistical power to detect differences between groups. The retrospective nature of this study makes any causal interpretation speculative. As well, subjects included in our study may not be representative of other populations of bipolar patients.

CONCLUSION

BD individuals with a familial liability for suicidal behavior and exposed to physical and/or sexual abuse during the childhood are at a greater risk to have a more impaired course of bipolar illness and greater suicidality compared to those subjects with either only one or none of these risk factors. The development of early psychosocial interventions targeted to high-risks group are urgently needed. In this case, risk is relatively easily identified allowing for early, targeted intervention for the child and their family. Further prospective studies are needed to confirm and extend these findings.

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Table 1

Demographic Characteristics, Suicidality, Course of Illness and Clinical features of Bipolar Disorder Patients

	BD-NONE group (0) (n=78)			BD-ONE group (1) (n=68)			BD-BOTH group (2) (n=20)			Analysis		
Demographic Characteristics	**N**	**Mean/ (N with Characteristic)**	**SD/(%)**	**N**	**Mean/ (N with Characteristic)**	**SD/(%)**	**N**	**Mean/ (N with Characteristic)**	**SD/(%)**	**F/(χ^2)**	**df**	**p**
Age (years)	78	36.7	10.8	67	35.9	11.2	20	32.7	8.7	1.14	2, 162	0.322
Education (years)	77	15.2	2.7	68	14.9	2.4	20	14.4	2.6	0.92	2, 162	0.399
Income level (US$/yr)	75	22668.0	25478.1	63	18793.7	19955.7	19	14789.5	12908.1	1.15	2, 154	0.317
Marital status (% married)	78	(19)	(24.4)	68	(19)	(27.9)	20	(4)	(20)	(0.58)	2	0.746
Gender (% Male)	78	(38)	(48.7)	68	(25)	(36.8)	20	(5)	(25)	(4.54)	2	0.103
Suicidality												
History of suicide attempt	78	(44)	(56.4)	68	(54)	(79.4)	20	(18)	(90.0)	(13.51)	2	0.001[a,b]
History of suicide attempt (early onset of BD)	23	(16)	(69.6)	37	(34)	(91.9)	16	(16)	(100.0)	(9.26)	2	0.01[a,b]
Age at first attempt	44	26.2	10.1	53	22.1	11.5	18	18.1	6.9	4.21	2, 112	0.017[b]
Number of attempts	44	2.0	1.2	54	3.0	2.2	18	4.1	2.2	8.39	2, 113	<0.001[a,b]
Suicide Intent at the most lethal attempt	42	14.8	6.2	50	16.9	5.0	17	18.1	5.9	2.71	2, 106	0.071
Lethality at the most lethal attempt	44	3.5	2.2	50	3.3	1.8	17	3.4	1.3	0.17	2, 108	0.843
Course of illness and clinical features												
Age of onset bipolar illness	70	22.2	9.8	63	19.1	10.9	19	13.1	6.7	6.42	2, 149	0.002[b]
Age at first hospitalization	54	29.1	11.4	54	26.5	10.5	15	21.1	8.1	3.56	2, 120	0.038[b]
BIS	65	60.5	18.7	58	59.6	18.9	19	72.1	15.9	3.55	2, 139	0.031[b,d]
BDHI	67	39.0	13.8	55	39.9	10.7	19	45.2	11.4	1.87	2, 138	0.157
BGAHS	71	19.5	6.5	61	20.7	5.1	20	24.3	8.5	4.58	2, 149	0.012[b]
BHS	68	10.7	6	63	10.2	5.8	19	13.2	5.4	1.97	2, 147	0.143
RFL	64	169.1	45.9	58	148.4	44.4	19	138.0	35.0	5.31	2, 138	0.006[a,b]
Stressful life events	69	4.0	1.1	57	4.1	1.1	19	4.7	0.5	2.95	2, 142	0.056
History of substance use disorder	72	(29)	(40.3)	59	(41)	(69.5)	18	(13)	(72.2)	(13.48)	2	0.001[a,b]
Borderline personality disorder	67	(13)	(19.4)	45	(12)	(26.7)	18	(10)	(55.6)	(9.41)	2	0.009[a,b]

BIS: Barratt Impulsivity Scale; BDHI: Buss-Durkey Hostility Inventory; BGAHS: Brown-Goodwin Aggression History Scale; BHS: Beck Hopelessness Scale; RFL: Reasons for Living Inventory

$c=0 < 1 < 2$

$a_{0<1}$

$b_{0<2}$

$d_{1<2}$