ANXIETY CONTRIBUTES TO SUICIDALITY IN DEPRESSED ADOLESCENTS

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Several studies have suggested a positive association between anxiety symptoms and suicidality in adults. However, relatively little is known about this topic in adolescents. To investigate this issue, we examined a group of adolescents admitted to our psychiatric inpatient unit. Fifty-six adolescents (mean age = 14.8±1.4; females = 34, males = 22; race = 95% Caucasians) participated in the study. Diagnoses were made using the DSM-III-R criteria and a diagnostic interview. Anxiety was found to significantly correlate with depression (r = .60; P = < .05) and suicidality (r = .72; P < .05). A multiple regression analysis revealed that anxiety and depression together accounted for more than half (55%) of the variance in suicidal ideation [F(2,46) = 28.4; P < .0001]. In addition, anxiety had an independent ability to predict suicidality (t = 5.01; P < .0001). Self-rated but not clinician-rated suicidality was positively correlated with both anxiety and depression. Clinical and research implications of these findings are discussed. Depression and Anxiety 11:134–138, 2000.
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INTRODUCTION

Suicide is the third leading cause of death among adolescents and young adults between the ages of 15 and 24 years (National Center for Health Statistics, 1990). Psychiatric disorders generally found to predispose toward suicidal behavior in adults are depression, alcohol and substance abuse, and psychotic disorders [Hall et al., 1999]. Some studies have also suggested a link between both trait and state measures of anxiety disorders and suicidality [Apter et al., 1993; Johnson et al., 1990; Coryell et al., 1990; Fawcett et al., 1990; Hall et al., 1999]. Findings are, however, inconsistent and some have discounted the role of anxiety. For example, Noyes [1991] stated that "those with anxiety disorders infrequently express thought of ending their lives."

While several studies of suicidal adolescents have highlighted the role of mood disorders, substance abuse, antisocial aggressive behaviors, and conduct disorders [Carlson and Cantwell, 1980; Pfeffer et al., 1982], relatively little is known about the role of anxiety symptoms. The available information regarding the role of anxiety is sparse and conflicting. Kashani et al. [1990], using the Revised Children Manifest Anxiety Scale [RCMAS; Reynolds and Richmond, 1978], found higher levels of anxiety in a suicidal group of hospitalized children when compared with the non-suicidal sub-group. In a recent study of pre-pubertal children (age range = 8–11 years), Allan et al. [1998],

also using the RCMAS among a group of suicidal children, identified a sub-group who were highly anxious. The suicidal-anxious children differed from the non-anxious-suicidal children in experiencing a greater number of adverse life-events, possessed poor social skills, and the parents identified themselves as being anxious and hostile. The authors concluded that there might exist a sub-group of "anxious-suicidal" youth who are significantly impaired and possibly at high risk for self-harm. Bettes and Walker [1986], using a clinical interview method among 7,828 black children, ranging in age from 11 to 18 years, identified a higher prevalence of anxiety among those who reported suicidal ideation compared with those without suicidal ideation. They also found that the suicidal boys were

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markedly more anxious than the suicidal girls. Brent and colleagues [1986], using the Diagnostic Interview Schedule for Children [DISC; Costello et al., 1982], identified high levels of anxiety among suicidal children and adolescents, ranging in age from 6 to 18 years, who had been referred for an outpatient evaluation. In contrast, in a community study, Lewinsohn et al. [1993] found that past history of suicidal attempts among adolescents was not associated with presence of anxiety. Similarly, Khan [1987] did not find significant differences on Axis I and Axis II disorders among hospitalized suicidal and non-suicidal adolescents. However, the group comparisons were limited to DSM-III syndromes and did not examine the role of symptoms, therefore possibly missing anxiety and other symptoms associated with suicidal behaviors.

Review of the above studies suggests that, first, there is inadequate data with regard to the role of anxiety among suicidal adolescents with the current data largely derived from relationship between adult and pre-adolescent literature; second, the role of anxiety as a *symptom* is relatively less well explored compared with syndromes of anxiety; and third, understanding the role of anxiety, a common symptom in clinical practice, would improve the evaluation of suicidal youth. The present study involved hospitalized adolescents, the majority of whom suffered from depression. It was hypothesized that anxiety is a prominent symptom among suicidal adolescents and is related to suicidal behaviors.

METHOD

Participants were 56 consecutively hospitalized adolescents, admitted to an inpatient unit in a university hospital. By using a consent form that has been approved by the Human Ethics Committee, we obtained informed consent from a parent/legal guardian and assent of the adolescent. All psychiatric assessments were completed within 72 hr of admission by a child and adolescent psychiatrist or a clinical psychologist. Diagnostic evaluations included a clinical interview, a structured diagnostic interview, and rating scales for measuring severity of depression, anxiety, and suicidal behavior. All rating scales used in this study have established validity and reliability. Routine laboratory investigations and round-the-clock nursing observation were completed. Exclusion criteria were the presence of a major medical disorder and/or mental retardation. Subjects were labeled suicidal if at the time of admission the patient and/or a family member reported a recent (within the past 2 weeks) expression of suicidal ideation, threat, or a suicide attempt.

Instruments were the Kiddie-SADS-Present Episode (K-SADS-P; Puig-Antich, 1986], which is a semi-structured diagnostic interview designed to record information related to symptoms and functioning for the current episode of psychiatric disorder. The Children's Depression Rating Scale-Revised [CDRS-R; Poznanski et al., 1985] is a clinician rating

scale for depression; a score of 40 or above is generally regarded as indicative of clinical depression. The Revised Children Manifest Anxiety Scale [RCMAS; Reynolds and Richmond, 1978] is a 28 item, self-report measure of anxiety and includes three sub-scales: Physiological Anxiety, which is a measure of physical manifestations of anxiety; Worry/Oversensitivity, which identifies whether the adolescent is worried or is oversensitive to the environment; and Social concerns/Concentration, which identifies concerns about self vis-a-vis other people and difficulty in concentrating. A total anxiety T-score greater than 60 is generally considered pathological. The Anxiety Rating Scale for Children (ARC; Erbaugh, unpublished instrument) is a clinician-rated instrument of anxiety based on a semi-structured interview with the child. The items on the seven subscales are adapted from the Hamilton Anxiety Scale for Adults [Hamilton, 1967]. The range of scores is from 0 to 21, with 0 to 7 in the mild, 8 to 14 in the moderate, and 15 to 21 in the severe range. The Suicidal Ideation Questionnaire-junior high school version [SIQ-JR; Reynolds, 1988] is a self-rated scale for suicidal ideation; a score of 31 or above is generally considered to signify psychopathology and suicide risk. The Spectrum of Suicidal Behavior Scale [SSB, Pfeffer, 1986] is a clinician-rated instrument, which estimates suicidal ideation/behaviors for the past week, 6 months, and lifetime. Ratings are 1 = nonsuicidal, 2 = suicidal ideation, 3 = suicidal threat, 4 = mild attempt, and 5 = serious attempt. The past week SSB rating scores were used in all our analyses. This ordinal categorical variable was rescored to create a two level categorical variable (RSSB); SSB scores 1 and 2 were rescored as RSSB I, and 3, 4, and 5 were rescored as RSSB II.

RESULTS AND DISCUSSION

Age range of the participants was 13–18 years (mean±SD = 14.8±1.4); there were 34 females (60%) and 22 males (40%); socio-economic distribution was determined using the methodology of Hollingshead and Redlich [1958]: upper class (5.4%), upper-middle (12.5%), middle (16.1%), lower-middle (30.4%), and lower (16.1%); IQ was 107.6±12.6 (mean±SD). The most common Axis 1 diagnosis, evident in 31 (70%) of the subjects, was a mood disorder (major depression = 25, dysthymia = 5, and bipolar disorder = 1) (Table 1). Sixteen (35.2%) suffered from an Axis 1 anxiety disorder (see Table 1). Comorbid diagnoses were common.

Depression severity, measured using the CDRS-R, was 51.4±14.4 (mean±SD); spectrum of suicidal behavior using the SSB was 2.7±1.3 (mean±SD); self-rating of suicidal ideation using the SIQ-JR was 23.3 ±22.7 (mean±SD); clinician-rated anxiety score using the ARC was 11.2±6.8 (mean±SD); and self-rated anxiety using the RCMAS was 52.5±12.5 (mean±SD).

There were 21 suicidal and 35 non-suicidal adolescents on admission as determined by using the information given by the patient and/or family. By using the RCMAS scores of anxiety, nonsuicidal and suicidal

TABLE 1. DSM-III-R, Axis 1 diagnosis (n = 44)

Diagnoses	Axis I diagnoses n (%)
Major depression	25 (57)
Dysthymia	12 (26.4)
Bipolar Disorder	1 (2.2)
Adjustment disorder	3 (6.6)
Attention deficit hyperactivity	2 (4.4)
Post traumatic stress disorder	3 (6.6)
Conduct disorder	6 (13.2)
Oppositional defiant disorder	4 (8.8)
Separation anxiety disorder	9 (19.8)
Overanxious disorder	4 (8.8)
Panic disorder	1 (2.2)
Obsessive compulsive dis	2 (4.4)
Brief reactive psychosis	2 (4.4)
Schizoaffective disorder	1 (2.2)
Substance abuse disorders	16 (35.2)
Eating disorders	2 (4.4)
Enuresis	1 (2.2)

adolescents were equally anxious; [RCMAS-non-sucidal = 51.4±13.0;RCMAS-suicidal = 54.4±11.7, t(54) = –0.9, P = 0.4]; there were no significant differences between the anxiety, severity of depression, and scores of suicidality of boys and girls.

Table 2 shows significant correlations for the entire sample of hospitalized adolescents. Correlation coefficients were computed between measures of anxiety, suicidal ideation/behaviors, and depression. The self-rated anxiety score (RCMAS) and clinician-rated anxiety score (ARC) were significantly correlated with depression severity (CDRS-R) and self-report measure of suicidal ideation (SIQ-JR) but not with clinician-rated suicidal ideation/behavior (SSB). All three subscales of RCMAS were also significantly correlated with SIQ-JR and CDRS-R but not with SSB. In other words, anxiety and depression were significantly correlated with each other, suicide ideation on self-report, but not with clinician-rated SSB. Next, a point biserial correlation [Nunnaly and Bunstein, 1994] was computed between the rescored SSB (RSSB) and behavior ratings of depression, anxiety, and self-rated suicidality. There were no significant correlations between RSSB and any of the behavior scores.

Next, by using measures of anxiety, suicidal ideation/behaviors, and depression, correlations were computed for boys and girls separately. The ARC and RCMAS were significantly correlated with SIQ-JR and CDRS for boys: with SIQ-Jr (r = .40, P = 0.05; r = .71, P = 0.001) and with CDRS-R (r = .37, P = 0.04; r = .45, P = 0.02); for girls: with SIQ-Jr (r = .79, P = 0.0001; r = .73, P = 0.0001) and with CDRS-R (r = .48, P = 0.002; r = .67, P = 0.0001). The rescored SSB (RSSB) for both boys and girls was not correlated with any other behavior scores. In other words, clinician-rated suicidal assessment of boys and girls was not correlated with any other behavior rating (depression, anxiety, or self-rated suicidality). There are several possible reasons for the observed discrepancy between self-rated and clinician-rated suici-

TABLE 2. Correlations between depression, suicidality, and anxiety[†]

Measures	CDRS	SIQ-Jr	RSSB	RCMAS	ARC	Physiological RCMAS[a]	Worry/ oversensitivity RCMAS[b]	Social concern concentration RCMAS[c]
CDRS	—	.55* (49)	.11 (36)	.60* (56)	.50* (55)	.49* (56)	.47* (56)	.61* (56)
SIQ-Jr	.55* (49)	—	.05 (31)	.72* (49)	.70* (48)	.67* (49)	.57* (49)	.64* (49)
RSSB	.16 (44)	.2 (36)	—	.12 (44)	.23 (43)			
RCMAS	.60* (56)	.72* (49)	.10 (36)	—	.74* (55)	.85* (56)	.88* (56)	.78* (56)
ARC	.50* (55)	.70* (48)	.22 (36)	.74* (55)	—	.70* (55)	.65* (55)	.60* (55)
Physiological-RCMAS	.49* (56)	.67* (49)	.09 (36)	.85* (56)	.70* (55)	—	.64* (56)	.57* (56)
Oversensitivity-RCMAS	.47* (56)	.57* (49)	.23 (36)	.88* (56)	.65* (55)	.64* (56)	—	.58* (56)
Social concern/Concentration RCMAS	.61* (56)	.64* (49)	–.04 (36)	.78* (56)	.60* (55)	.78* (56)	.58* (56)	—

[†]*Number of subjects is indicated in parentheses. CDRS, Children's Depression Scale-Revised. SIQ-Jr, Suicidal Ideation Questionnaire. RSSB, Rescored Spectrum of Suicidal Behavior Scale. RCMAS, Revised Children Manifest Anxiety Scale. ARC, Anxiety Rating Scale for Children.* [a,b,c]*Subscales of RCMAS.*
*P<.05.

dality. For instance, Safer [1997] noted that self-reported suicidality among adolescents may be two to three times higher than when a non-anonymous method of reporting was used. Although, self-report and anonymous reporting are not identical processes, self-reporting may offer a degree of anonymity that is less threatening to adolescents and thus more revealing for self-harm. Further, the same author also identified that adolescents regard *self-harm* distinct from *suicide attempts*. Therefore, any assessment of suicide rather than self-harm may result in an under-estimation of the phenomenon. In other words, the discrepancy in our study may be due to the difference in language used by clinicians and adolescents. Although, these factors do not conclusively explain the observed discrepancy between self- and clinician-reported suicidality, our finding may be related to some other, as yet unidentified, factors, i.e., a greater desire to please, low self-esteem, or shame experienced by the young patient, which lead to less self-disclosure. Irrespective of the reason, it would thus appear that clinician-rated assessment of suicidality may not always detect the adolescent's internal experience of suicidal thoughts/behaviors.

Next, using a multiple regression analysis of CDRS-R, RCMAS, and SIQ-JR, we found that CDRS-R and RCMAS together accounted for 55% of variance in SIQ-JR ([$F_{(2,46)}$ = 28.4; *P* < 0.0001]. CDRS-R scores alone accounted for 31% of the variance in SIQ-JR scores; an additional 24% of the variance was accounted for by inclusion of RCMAS scores in the regression equation. Therefore, anxiety made an independent contribution of 24% in predicting suicidal ideation (t = 5.01; *P* < 0.0001). The clinical implication of this finding is, first, that depression and anxiety not only go hand in hand (Table 2) but the evaluation of suicidal behavior is likely to be more complete when both depression and anxiety are included in the assessment. Depression is regarded as the single best predictor of suicidal behavior in children; however, one study noted that 60% of the suicidal subjects in their sample did not suffer from major depression [Kashani et al., 1989]. Thus, our finding underscores the importance of assessing for non-mood symptoms in suicidal adolescents. Second, whenever possible, self-ratings should supplement clinical assessments of suicidality because of the possible discrepancy between self and clinician ratings.

In conclusion, we studied a group of hospitalized adolescents, the majority of whom suffered from a mood disorder. Subjects were found to suffer from moderately severe symptoms of depression, anxiety, and suicidality. We found that the symptoms of anxiety, depression, and *self rated suicidal ideation*, but not clinician-rated suicidality, were significantly associated with each other; there were no gender-related differences in the severity of anxiety, depression, clinician-rated and self-rated suicidal ideation; among both boys and girls there was no association between clinician- and self-rated suicidality; and, finally, the symp-

tom of anxiety made an independent and an additive contribution to the severity of suicidal ideation. Although, approximately one third of the patients were diagnosed with an Axis 1 DSM-anxiety disorder, findings suggest that the anxiety *symptom* is important and warrants assessment when an adolescent presents with suicidal ideation/behaviors. Findings also suggest that assessment of adolescents may be complicated by a discrepancy between self- and clinician-rated suicidality; this discrepancy between clinician-rated and self-rated suicidal ideation/behavior merits further study. Drawbacks of the present study include a relatively small sample size, lack of data regarding impact of anxiety syndromes versus anxiety symptoms on suicidality, whether anxiety preceded or followed suicidality, and an in-depth understanding of suicidal behaviors of those adolescents who were also anxious.

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