Anxiety Disorders Associated With Suicidal Ideation and Suicide Attempts in the National Comorbidity Survey

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Abstract: This study examined the relationship between anxiety disorders and suicidal ideation or suicide attempts in a nationally representative sample ($N = 5877$; age, 15–54; response rate, 82.4%). A modified version of the Composite International Diagnostic Interview was used to make DSM-III-R mental disorder diagnoses. Two multivariate logistic regression analyses were performed with suicidal ideation ($N = 754$) and suicide attempts ($N = 259$) as dependent variables. In each regression, the independent variables entered were lifetime social phobia, panic disorder, agoraphobia, generalized anxiety disorder, simple phobia, and posttraumatic stress disorder (PTSD). Covariates in the analyses were sociodemographics, lifetime mood disorders, substance use disorders, nonaffective psychosis, antisocial personality disorder, and presence of three or more lifetime DSM-III-R diagnoses. PTSD was significantly associated with suicidal ideation (adjusted odds ratio = 2.79; $p < 0.01$) and suicide attempts (adjusted odds ratio = 2.67; $p < 0.01$). None of the other anxiety disorders were significantly associated with suicidal ideation or attempts. The robust association between PTSD and suicide attempts has important implications for psychiatric assessment of suicidal behavior. Future research is required to investigate the mechanisms underlying the relationship between PTSD and suicidal behavior.

Key Words: Suicide, anxiety, posttraumatic stress disorder, epidemiology, depression.

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Clinical and epidemiologic studies have demonstrated a positive association between individual anxiety disorders (generalized anxiety disorder, agoraphobia, simple phobia, social phobia, panic disorder, and posttraumatic stress disorder [PTSD]) and suicidal ideation and suicide attempts (Cox et al., 1994; Ferrada-Noli et al., 1998; Kessler et al., 1995, 1999; Kotler et al., 2001; Weissman et al., 1989). However, controversy remains as to whether reported associations between individual anxiety disorders and suicidality represent unique associations or rather reflect the influence of comorbidity with other mental disorders, especially major depression (Appleby, 1994; Lepine et al., 1993).

Among anxiety disorders, panic disorder has been most extensively studied with respect to suicidality. Using data from the Epidemiologic Catchment Area (ECA) study, Weissman et al. (1989) found a significant association between panic disorder and suicidality. Hornig and McNally (1995) reanalyzed the ECA data and reported that when controlling for comorbid disorders in the aggregate rather than individually, no relationship was found between panic disorder and suicidal ideation or suicide attempts. A range of clinical studies (Beck et al., 1991; Cox et al., 1994; Lepine et al., 1993; Schmidt et al., 2001; Starcevic et al., 1999; Warshaw et al., 1995, 2000) have similarly found elevated rates of suicidal ideation and suicide attempts among panic disorder patients. However, there was also evidence in all of these studies to suggest that panic disorder was not associated with suicidal behavior once the effects of psychiatric comorbidity were statistically controlled.

Similar to panic disorder, studies examining the relationship between PTSD and suicidal behavior have also found conflicting results. Early reports from combat did not find an association between PTSD and suicidal behavior (Bullman and Kang, 1994; Hendin and Haas, 1991; Hyer

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et al., 1990; Pollock et al., 1990). In recent years, a new line of research has provided accumulating evidence that PTSD is significantly associated with suicidal ideation and suicide attempts. This association has been supported by a range of clinical studies (Ferrada-Noli et al., 1998; Kotler et al., 2001) and community samples (Davidson et al., 1991; Helzer et al., 1987; Kessler et al., 1995; Wunderlich et al., 1998). A study using the National Anxiety Screening day sample found that PTSD as well as subthreshold PTSD was associated with suicidal ideation after adjusting for major depression (Marshall et al., 2001). Recently, a study of inpatients with major depression found that comorbid PTSD was significantly associated with suicidal behavior after adjusting for major depression, substance abuse, and cluster B personality disorders (Oquendo et al., 2003). Thus, evidence from clinical samples suggests that PTSD may be associated with suicidal behavior after adjusting for comorbidity with other mental disorders. However, the relationship between PTSD with suicidal behavior (after adjusting for comorbid mental disorders) has never been investigated in a nationally representative sample.

The current investigation used data from the National Comorbidity Survey (NCS), which included assessment of all anxiety disorders assessed in the ECA except obsessive compulsive disorder. In addition, the NCS was the first US national survey to provide prevalence and correlates of PTSD. Based on the analytic approach applied to the earlier ECA data (Hornig and McNally, 1995), our objective was simultaneously to examine the associations between individual anxiety disorders with suicidal ideation and suicide attempts in a multivariate model that accounted for sociodemographic factors, other mental disorders, and presence of multiple mental disorders (i.e., comorbidity).

METHODS

Sample

Respondents were from the NCS public use data set (Kessler et al., 1994). The survey was based on a stratified multistage area probability sample of the noninstitutionalized, civilian, US population age 15 to 54 years. The response rate for the survey was 82.4%. Informed consent was obtained from all respondents and also from parents of minors. Detailed descriptions of the sample and weighting procedures have been reported previously (Kessler et al., 1994). The NCS interview was administered in two parts. Part I included structured diagnostic interview assessment of DSM-III-R mental disorders. Part II was administered to a large representative subsample of respondents ($N = 5877$) who completed a more detailed assessment that included questions about suicidal behavior (Kessler et al., 1999).

Diagnostic Assessment

Interviews were performed by trained interviewers using a modified version of the Composite International Diagnostic Interview (CIDI; Wittchen, 1994) to assess for lifetime and current diagnoses based on DSM-III-R criteria. DSM diagnoses assessed by the CIDI in this survey were panic disorder, agoraphobia without panic, generalized anxiety disorder, social phobia, simple phobia, major depression, dysthymia, bipolar disorder, alcohol abuse or dependence, substance abuse or dependence, antisocial personality disorder, and nonaffective psychosis. All diagnoses made by the CIDI except for the nonaffective psychosis diagnosis (Kendler et al., 1996) have demonstrated high rates of reliability and validity in extensive field trials (Wittchen, 1994). The assessment of PTSD was conducted using a modified version of the Revised Diagnostic Interview Schedule. Details of the methodology of the assessment of PTSD in the NCS have been presented previously (Kessler et al., 1995; Molnar et al., 2001).

Assessment of suicidal ideation and suicide attempts in the NCS was conducted during the life event history section of the interview based on the following questions: “Have you ever seriously thought about committing suicide?” and “Have you ever attempted suicide?” We examined respondents endorsing presence of suicidal ideation ($N = 759$) or attempts ($N = 259$) at any time in their lives (Kessler et al., 1999).

Data Analysis

Covariates in the multivariate analyses included sociodemographics (sex, age, ethnicity, level of education, and marital status), lifetime DSM-III-R diagnosis of major depression, dysthymia, bipolar disorder, alcohol abuse or dependence, substance abuse or dependence, nonaffective psychosis, and antisocial personality disorder. We also included the presence of three or more lifetime DSM-III-R disorders because this has been strongly associated with lifetime suicidal behavior (Kessler et al., 1999; Wunderlich et al., 1998).

In all analyses, the appropriate NCS part II statistical weight was employed to ensure the data was representative of the US general population according to a number of federal census indicators. The standard errors were calculated by using the Taylor Series Linearization method in the SUDAAN program (Shah et al., 1995) based on NCS stratification information in the public use data set that is available specifically for this purpose.

RESULTS

Table 1 presents the results of the multivariate logistic regression for lifetime suicidal ideation and for lifetime suicide attempts. The overall models were significant for suicidal ideation (Wald $F[19,42] = 120.18$; $p < 0.001$) and suicide attempts (Wald $F[19,42] = 126.46$; $p > 0.001$).

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TABLE 1. Results of the Multivariate Logistic Regression Analyses for Lifetime Suicide Ideation and Lifetime Suicide Attempts in the National Comorbidity Survey ($N = 5877$)[a]

Lifetime DSM-III-R diagnoses	Lifetime suicidal ideation AOR (95% CI)	Lifetime suicide attempts AOR (95% CI)
Agoraphobia without panic disorder	1.26 (0.90–1.10)	1.21 (0.75–1.97)
Generalized anxiety disorder	0.87 (0.57–1.32)	1.50 (0.98–2.30)
Panic disorder ± agoraphobia	1.40 (0.88–2.23)	1.14 (0.63–2.04)
Posttraumatic stress disorder	2.79 (2.02–3.84)**	2.67 (1.82–3.91)**
Simple phobia	1.26 (0.92–1.72)	0.78 (0.52–1.16)
Social phobia	1.01 (0.73–1.41)	0.88 (0.60–1.28)
Major depression	4.53 (3.61–5.69)**	3.34 (2.37–4.70)**
Dysthymia	1.66 (1.19–2.30)**	1.46 (1.00–2.15)*
Bipolar disorder	2.71 (1.05–7.00)*	4.00 (1.46–10.98)**
Alcohol abuse or dependence	1.20 (0.89–1.61)	1.37 (0.99–1.89)
Drug abuse or dependence	2.04 (1.57–2.66)**	1.51 (1.03–2.23)
Antisocial personality disorder	2.23 (1.50–3.31)**	2.34 (1.45–3.78)**
Nonaffective psychosis	1.41 (0.72–2.78)	1.16 (0.49–2.76)
Three or more lifetime DSM-III-R disorders	1.29 (0.92–1.83)	2.25 (1.42–3.55)**

*$p < 0.05$; **$p < 0.01$.
[a]Adjusted odds ratios (AORs) were adjusted for all other disorders above and for age, sex, marital status, education, and ethnicity.

PTSD was the only anxiety disorder that was significantly associated with both suicidal ideation and suicide attempts.

In addition to PTSD, each of the mood disorders (bipolar disorder, major depression, and dysthymia) and antisocial personality disorder was associated with suicide attempts and suicidal ideation. Drug abuse or dependence was associated with suicidal ideation but not suicide attempts. The presence of three or more lifetime DSM-III-R disorders was associated with suicide attempts but not suicidal ideation.

DISCUSSION

The present study is the first multivariate investigation of anxiety disorders with suicidal behavior using a nationally representative survey. PTSD was the only anxiety disorder that was independently associated with suicidal ideation and suicide attempts, and this association was robust even after controlling for effects of several known covariates, including the presence of high levels of comorbidity (presence of three or more disorders). These findings are consistent with previous studies in clinical and epidemiologic samples noting the elevated association between PTSD and suicidal behavior (Ferrada-Noli et al., 1998; Kotler et al., 2001; Kramer et al., 1994; Marshall et al., 2001). We speculate that the lack of association between combat-related PTSD and suicidal behavior found in previous studies (Bullman and Kang, 1994; Hendin and Haas, 1991; Hyer et al., 1990; Pollock et al., 1990) might be due to the overall lower likelihood of soldiers completing suicide as compared with general population samples (Bullman and Kang, 1996; Kang and Bullman, 1996). It is also possible that there may be a differential relationship between the type of traumatic event (e.g., combat-related, abuse, accident) and suicidal behavior. Overall, the current investigation, using a nationally representative sample, demonstrates that the positive relationship between PTSD and suicidal behavior is not due to comorbid depression as previously noted in clinical samples (Kramer et al., 1994).

The relationship between PTSD and suicidal behavior has important clinical and research implications. First, the present results suggest that the diagnosis of PTSD is a promising candidate variable to include in any comprehensive risk factor battery for suicidal behavior, along with more commonly assessed psychiatric variables like depression and substance abuse. Second, future work needs to delineate the etiologic mechanisms underlying the relationship between PTSD and suicidal behavior. Finally, future work needs to examine the efficacy of treatments that reduce suicidal behavior among individuals with PTSD.

Although an abundance of literature has investigated the relationship between panic disorder and suicidal behavior, the current investigation adds further evidence that panic disorder does not have an independent association with suicidal behavior. Unlike previous analyses from the ECA data that found agoraphobia to be associated with suicide attempts (Hornig and McNally, 1995), the current investigation did not replicate this finding in the NCS data set. Similarly, social phobia, simple phobia, and generalized anxiety disorder were not found to be independently associated with suicidal behavior. The lack of unique effects for non-PTSD anxiety disorders in multivariate models of suicidal behavior underscores the importance of comorbid mental disorders. Clinically, this consistent finding from recent literature suggests that when suicidal behavior is observed among patients with non-PTSD anxiety disorders, these patients should be carefully assessed for comorbid mood disorders, antisocial personality disorder, and drug use disorders.

The current study demonstrated a robust relationship between each of the mood disorders and antisocial personality disorder. It has been well established that major depression and bipolar disorder are strongly linked to suicidal behavior (Oquendo et al., 2004; Placidi et al., 2000). However, to the best our knowledge, this is the first study to

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demonstrate that dysthymia is associated with suicide attempts after adjusting for a range of comorbidity. Future examination of this novel finding is required, preferably using longitudinal data. Lastly, the current study found a strong positive association between antisocial personality disorder and suicide attempts. These findings are also consistent with previous studies noting an independent association between externalizing psychopathology (antisocial behavior or alcohol/drug use disorders) and suicidal behavior (Verona et al., 2004). The current findings underscore the importance of targeting effective and early intervention of individuals suffering with PTSD, mood disorders, and antisocial personality disorder in an effort to reduce the burden of suicidal behavior in society.

The current study's findings should be interpreted with the consideration of the following limitations. First, the NCS by design is able to capture suicidal ideation and attempts, but not completed suicide. These three dimensions of suicidality are generally believed to lie on the same spectrum, but it is possible that PTSD could increase risk for suicidal ideation and attempts but not completed suicide. Future studies utilizing methods of psychological autopsy of individuals committing suicide should consider assessment of PTSD. Secondly, the cross-sectional nature of the NCS precludes any causal inference from these results. Longitudinal research is necessary to investigate further the relationship between anxiety disorders and suicidal ideation and suicide attempts.

CONCLUSION

Among the anxiety disorders examined in the NCS, PTSD was the only anxiety disorder that was significantly associated with suicidal ideation and suicide attempts after accounting for a wide range of other sociodemographic and psychiatric covariates, including the presence of multiple comorbid disorders. These findings, in combination with other data in the literature, suggest that PTSD is a severe and disabling disorder that may place affected individuals at increased risk for a number of negative outcomes and eventual suicidal behavior.

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