

Panic attacks and psychopathology among youth

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Objective: To determine the association between panic attacks and mental disorders among youth in the community.

Method: Data were drawn from the Methods for the Epidemiology of Child and Adolescent Mental Disorders study ($n = 1285$), a community-based sample of youth aged 9–17. Multiple logistic regression analyses were used to determine the association between panic attacks and the range of mental disorders, diagnosed with the Diagnostic Interview Schedule for Children 2.3.

Results: Panic attacks were prevalent among 3.3% of the sample. Panic attacks were associated with an increased likelihood of any anxiety disorders [OR = 4.6 (2.5, 8.5)] and any affective disorder [OR = 5.8 (2.8, 11.7)], as well as social phobia [OR = 2.3 (1.0, 5.4)], specific phobia [OR = 3.4 (1.1, 10.1)], agoraphobia [OR = 2.9 (1.1, 7.6)], generalized anxiety disorder [OR = 4.8 (1.9, 12.1)], separation anxiety disorder [OR = 3.1 (1.3, 7.7)], major depression [OR = 3.6 (1.6, 8.3)], dysthymia [OR = 6.7 (2.9, 15.5)], and hypomania [OR = 26.1 (5.5, 124.1)].

Conclusion: These data are consistent with, and extend, previous clinical findings by showing that panic attacks are associated with increased likelihood of a range of affective and anxiety disorders, but not substance use disorders, among youth in the community. The use of longitudinal study designs in future investigations may be useful in increasing our understanding of the mechanisms underlying these associations.

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Introduction

Evidence from clinical and community-based studies in adults suggest that panic attacks are associated with increased rates of a wide range of mental disorders, especially among those with onset of panic attack early in life (1–22). Several studies using epidemiologic samples of adults have found that anxiety disorders, especially panic attacks, tend to have an onset prior to that of comorbid affective, and substance use disorders in the majority of comorbid cases (1–5); and that panic attacks predict onset of depression and comorbid anxiety disorders in adolescents (2, 3, 8, 11, 23). Previous results also suggest that the onset of panic attacks precedes the onset of other mental disorders in the majority of cases, but further, that

earlier onset of panic attacks (<21 years) is associated with even higher risk of comorbid mental disorders, compared with later onset (3, 4, 12, 13, 15, 24). Once primarily considered a subclinical form of panic disorder, or predictor of panic disorder onset, a relationship between panic attacks and increased risk of depressive disorders, bipolar disorder, anxiety disorders, substance use disorders, and psychotic symptoms has been demonstrated in clinical and community-based studies (1–22). While comorbidity associated with mental disorders is overwhelming, especially among those with onsets of depressive and anxiety disorders early in life (3, 4, 24), it is conceivable that the deleterious impact of serious disorders on social and academic functioning might ultimately be reduced with the development of effective

intervention and prevention strategies, if identification of specific markers or non-specific causal risk factors were possible (25, 26).

Efforts to identify precursors and prodromal symptoms of severe mental disorders (e.g. schizophrenia, major affective disorders) during childhood have primarily focused on associations between risk for severe psychopathology in adulthood and depressive and psychotic symptoms, disruptive behavior problems, and social and cognitive deficits during childhood (27–33). Yet, numerous studies in youth have shown that panic attacks are not uncommon, identifiable using standard self-report questionnaires, and are strongly associated with a range of mental disorders. Studies in clinical populations have repeatedly shown linkages between panic attacks and anxiety disorders, depression, and alcohol use disorders. Biederman et al. (22) found high rates of psychotic symptoms and bipolar disorders associated with panic attacks in a clinical sample of youth. Community-based studies have also shown associations between panic attacks and increased odds of panic disorder and other anxiety disorders among young females (13). Specifically, Hayward et al. (13) found high rates of comorbid depressive and anxiety disorders, but not alcohol or substance use disorders among youth with panic attacks.

Taken together, previous data suggest an association between panic attacks and anxiety and depressive disorders in youth. There are several methodological shortcomings, however, that limit the generalizability of these findings. First, no previous study has examined the association between panic attacks and the full range of comorbid psychopathology in youth. Secondly, previous studies that have included assessment of comorbid anxiety and depression have not used standardized assessments (i.e. using DSM criteria), which limit the generalizability of these findings.

Aims of the study

The primary goal of the current study is to begin to fill this gap by investigating the relation between panic attacks and mental disorders among youth in the community. In this context, the present study will examine the relation between panic attacks and depressive, anxiety, substance use, and disruptive behavior disorders using standardized assessments within a large sample of youth. Based on previous findings from adults in clinical and community-based samples, we hypothesized that panic attacks would be associated with a signifi-

cantly increased likelihood of a wide range of comorbid mental disorders among youth in the community.

Material and methods

Samples

Data were drawn from the National Institute of Mental Health (NIMH) Methods for the Epidemiology of Child and Adolescent Mental Disorders (MECA) Study. The MECA was a collaborative project performed to develop methods for surveys of mental disorders and service utilization in unscreened samples of children and adolescents in the community. The MECA was a cross-sectional epidemiologic study designed to gather data on childhood psychopathology with structured clinical interviews of both the child and parent (U01MH46718) (34, 35). Detailed descriptions of the sociodemographic characteristics of the sample have been provided. Probability household samples of youth aged 9–17 were gathered at four sites in the United States in which 1285 pairs of youth and their caretakers were surveyed in their home. The four sites were: Columbia University, Emory University, the University of Puerto Rico, and Yale University. More than 7500 households were enumerated at four sites. Enumeration response rates were over 99%.

Procedures

In the MECA Study, one child and one parent/guardian in each family were interviewed and detailed information on the child was obtained, including child psychiatric diagnoses. Lay interviewers administered a computer-assisted version of the NIMH-Diagnostic Interview Schedule for Children (DISC) Version 2.3 (36). Interviewers all had experience with children and adolescents and had a range of educational achievement. Interviewers were trained for 10–12 days prior to the first interviews. Training involved general survey methods, administration of computer-assisted and paper-and-pencil version of the interviews, ethical issues, and administrative procedures (37). All sites held interviewer meetings throughout the study to review procedures and provide additional training as needed.

Measures

NIMH's DISC 2.3 (36) was used to diagnose anxiety, affective, and disruptive behavior disorders and a screen for psychosis. Diagnoses were made using a diagnostic algorithm that combines

information from both child and parent/caregiver and requires associated impairment. Information on medication use and mental health treatment, general functioning (CGAS and CIS), family history of psychopathology and environmental risk and protective factors (e.g. child’s IQ, physical health, social competence, educational aspiration, parental relationships, adverse life events, and socioeconomic status) was also obtained in the survey. Panic attacks were diagnosed in the presence of at least four of 13 possible symptoms within a panic attack. Please see reference (34–35) for more detailed description of the methods of the MECA in which also detailed descriptions of the sociodemographic characteristics of the sample have been provided.

Analytic strategy

First, Pearson’s chi-square tests and *f*-based tests of independence were used to examine differences in sociodemographic characteristics between youth with and without panic attacks. All tests were two-tailed and significance was set at 0.05. Fischers exact tests were used when cell fell below 5. Next, multiple logistic regression analyses were conducted to determine the association between panic attacks and each mental disorder. In conducting these analyses, unadjusted odds ratios were computed, with 95% confidence intervals. Analyses were then rerun adjusting for differences in age and gender. SPSS statistical software package was used to perform statistical analyses (38).

Table 1. Sociodemographic characteristics associated with panic attacks among youth in the community

	No panic attacks <i>n</i> = 1220	Panic attacks <i>n</i> = 43	Chi-square, df, <i>P</i> -value
Age [mean (SD)]	12.9 (2.56)	13.4 (2.47)	ns
Gender			ns
Male (%)	53.5	41.9	
Female (%)	46.5	58.1	
Single parent (%)	23.7	18.6	ns
Low socioeconomic status (%)	14.9	14.3	ns

ns, Not significant.

Results

Characteristics of the sample

Panic attacks were reported by 3.3% (*n* = 43) of youth in the community. 1226 did not have panic attacks, and data on panic were missing for 16 participants. The mean age of the sample was 12.9 (2.6) years, and 53.0% were female (see Table 1). There were no statistically significant differences in sociodemographic characteristics between youth with and without panic attacks.

Panic attacks and comorbid mental disorders among youth

Panic attacks and anxiety disorders. Panic attacks were associated with increased likelihood of any anxiety disorder, social phobia, agoraphobia, generalized anxiety disorder, overanxious disorder, obsessive/compulsive disorder, and separation anxiety disorder, compared with without panic attacks (see Table 2). After adjusting for differ-

	No panic attacks <i>N</i> = 1226, % (<i>n</i>)	Panic attacks <i>N</i> = 43, % (<i>n</i>)	<i>P</i> -value	Panic attacks AOR ¹ (95% CI)
Any anxiety disorder	17.3 (221)	48.8 (21)	<0.0001	4.56 (2.46, 8.45)*
Social phobia	7.4 (91)	16.3 (7)	0.033	2.33 (1.003, 5.39)*
Specific phobia	3.2 (39)	9.3 (4)	0.055	3.38 (1.13, 10.06)*
Agoraphobia	4.4 (54)	11.6 (5)	0.027	2.85 (1.07, 7.58)*
Generalized anxiety disorder	3.1 (38)	14.0 (6)	<0.0001	4.77 (1.89, 12.05)*
Overanxious disorder	7.3 (89)	23.3 (10)	<0.0001	3.7 (1.76, 7.78)*
Obsessive or compulsive disorder	2.5 (31)	9.3 (4)	0.028	3.75 (1.26, 11.21)*
Separation anxiety disorder	5.4 (66)	14.0 (6)	0.017	3.1 (1.25, 7.66)*
Avoidant disorder	3.0 (37)	4.7 (2)	0.54	1.56 (.36, 6.72)
Any affective disorder	6.5 (80)	30.2 (13)	<0.0001	5.75 (2.82, 11.7)*
Major depression	5.2 (64)	18.6 (8)	<0.0001	3.61 (1.57, 8.31)*
Dysthymia	3.1 (38)	18.6 (8)	<0.0001	6.65 (2.86, 15.48)*
Mania	1.2 (15)	2.3 (1)	0.52	2.02 (.26, 15.73)
Hypomania	0.3 (4)	7.0 (3)	0.001	26.09 (5.49, 124.05)*
Any disruptive disorder	11.3 (139)	18.6 (8)	0.1	1.95 (0.88, 3.42)
ADHD	5.1 (62)	7.0 (3)	0.58	1.58 (0.47, 5.3)
Conduct disorder	3.9 (48)	4.7 (2)	0.8	1.2 (0.3, 5.37)
Oppositional defiant disorder	6.4 (79)	11.6 (5)	0.18	2.05 (0.8, 5.03)
Any substance use disorder	2.0 (24)	0	1.0	na

Table 2. Association between panic attacks and mental disorders among youth in the community (*n* = 1285)

* *P* < 0.05.

¹ Adjusted for age and gender.
na, not applicable.

ences in age and gender, panic attacks remained significantly associated with any anxiety disorder (OR = 4.56), social phobia (OR = 2.33), specific phobia (OR = 3.38), agoraphobia (OR = 2.85), generalized anxiety disorder (OR = 4.77), over-anxious disorder (OR = 3.7), obsessive/compulsive disorder (OR = 3.75), and separation anxiety disorder (OR = 3.1).

Association between panic attacks and affective disorders

Panic attacks were associated with a significantly increased likelihood of any affective disorder (OR = 5.75), major depression (OR = 3.61), dysthymia (OR = 6.65), and hypomania (OR = 26.09), compared with without panic attacks and these associations persisted after adjusting for differences in age and gender (see Table 2).

Association between panic attacks and disruptive and substance use disorders

Any disruptive disorder was more common among youth with, compared with those without, panic attacks though this difference did not reach statistical significance (see Table 2). There was no notable association between panic attacks and substance use disorders among youth.

Discussion

The data presented in this paper suggest that panic attacks are associated with increased likelihood of a range of psychopathology among youth in the community. Specifically, panic attacks are associated with increased odds of anxiety disorders and affective disorders among youth aged 9–17. In contrast to previous findings of an association between panic attacks and substance use disorders (12, 22) among young persons in clinical samples, and evidence of this linkage among adults in community and clinical samples, there was no statistically significant relationship between panic attacks in youth and substance use disorders in this sample.

The association between panic attacks and increased likelihood of comorbid anxiety disorders is consistent with previous findings from clinical and community-based samples among youth and adults (1–22, 39, 40). For example, Hayward et al. (12, 13) have noted strong linkages between panic attacks and phobia, panic disorder, and separation anxiety disorder among female high school students in the community, as well as in clinical samples (10, 12, 13, 17, 22). Anxiety disorders are thought to have among the earliest mean onset of

any disorders, especially those that are associated with psychiatric comorbidity (4, 39). These findings are therefore not surprising, yet they remain poorly understood in terms of etiologic mechanisms.

These data reflect a strong association between panic attacks and affective disorders, especially major depression and dysthymia. The association between panic attacks and major depression among youth is consistent with previous findings from clinical samples documenting linkages between panic and depression in youth (7–9, 11, 12, 17, 22) and adults (2–6, 39). This association is seemingly inconsistent with the results of one previous study that examined the development of comorbid disorders at 6 months and further after entry into a clinical sample where they were treated for anxiety disorders, and in which over 80% were free of their baseline disorder at follow-up (20). However, the fact that these youth appear to have been effectively treated for their anxiety disorders may have influenced the lack of development of depression, as previous data suggest that anxiety is a risk factor for depression, and if this is true then the treatment of anxiety should significantly reduce this risk. This comparison then seems relatively consistent with our findings, and also appears to be consistent with previous findings in adult samples showing that treatment of panic attacks is associated with decreased risk of depression (41).

In contrast to previous findings indicating a link between panic attacks and substance use disorders among adults (1, 4, 5), and between panic attacks and substance use disorders in previous studies of youth in clinical settings (9, 10, 12, 17, 22), panic attacks were not independently associated with substance use disorders in the present data. There are several possible reasons for this discrepancy. First, previous clinical studies among youth with this finding have been performed with slightly older samples (e.g. ages 14, 15 years). Therefore, it is possible that this relationship does not emerge until later in the lifecourse. This may be due to later initiation of substance use because of availability and environmental circumstances. It is also possible that the onset of other factors, which increase the risk of substance use (e.g. exposure to deviant peer groups) is not as prominent in a child's life until a slightly older age, and this may contribute to the onset of this link. Secondly, this lack of association may also be related to the use of a community vs. clinical sample, as previous studies with this finding among youth have been conducted using selected samples among whom rates of substance use may be higher, compared with the general population. If this finding is replicated, youth who seek treatment for panic attacks or other mental disorders

may be at higher risk for several reasons, yet these data suggest that among youth in the community panic attacks are not associated with higher substance use disorders among those under age 17.

The identification of youth who are at risk for severe psychopathology is of public health importance given that mental disorders in youth are associated with increased risk of secondary psychiatric and physical comorbidity throughout the lifecourse, with impairment in social and academic functioning, and with increased risk of suicidal behavior among various age groups (2, 4, 42). If panic attacks are associated with an increased likelihood of a range of mental disorders, as suggested by the present data, then treatment of panic may be one avenue to explore in developing strategies aimed at preventive intervention. As a caveat, longitudinal studies are first needed to determine whether panic attacks are indeed a causal risk factor for comorbid disorders, or whether panic attacks may be a marker for severe psychopathology in some cases. This might suggest that the progressive development of a direct link between panic and depression, which may not emerge until adulthood, might be influenced by these modifiable factors.

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