Child Psychiatry Hum Dev (2007) 38:57–71
DOI 10.1007/s10578-006-0042-5

ORIGINAL PAPER

Panic Disorder in Clinically Referred Children and Adolescents

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Received: 28 June 2006 / Accepted: 30 October 2006 / Published online: 21 December 2006

Abstract The present study examined the frequency and characteristics of panic disorder in children and adolescents who had been referred to a pediatric psychopharmacology clinic. Of the 280 children and adolescents evaluated in this clinic, 35 were diagnosed with panic disorder using a semi-structured clinical interview (K-SADS) and other objective measures. Approximately half of the youngsters with panic disorder also met criteria for the diagnosis of agoraphobia. There was extensive comorbidity between panic disorder and other internalizing and externalizing disorders. Parents reported clinically significant levels of child symptomatology on the CBCL. Teacher- and child-reported symptomatology on the CBCL was within the normal range. At the same time, it was notable that no child had been referred specifically for evaluation or treatment of panic disorder or agoraphobia. Implications for clinical assessment/identification and treatment are discussed.

Keywords Panic disorder · Agoraphobia · Children · Adolescents · Anxiety disorders

Panic disorder (PD) was initially considered to be an adult disorder [1, 2] but recent research indicates that adolescents and prepubertal children do experience this disorder [3–6]. The prevalence of PD among adolescents in the general community

This paper was presented at the 39th Annual Convention of the Association for Behavioral and Cognitive Therapies, November 18, 2005, Washington, DC.

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has been reported to be about 1% [7–10]. In clinic samples of children and adolescents, the prevalence of PD has been reported to be as high as 10–15% [11–14]. This disorder is more common in females and adolescents, especially after 14 years of age [3, 6].

Now that it is accepted that children and adolescents experience PD, research has begun to examine whether the nature of panic is different in children, adolescents, and adults [2, 15]. A central issue is whether children have the cognitive capacity to make the catastrophic attributions that are characteristic of panic (e.g., thoughts of losing control or going crazy). The cognitive model of panic [16] proposes that PD results from a catastrophic misinterpretation of bodily sensations; in other words, the individual perceives that bodily sensations are far more dangerous than they actually are. Nelles and Barlow [2] contend that children's interpretation of their somatic symptoms shifts from external to internal causality over the course of development. They propose that younger children think that physical sensations have an external cause (e.g., ''my heart beats faster because I'm taking a test'') [2, 5, 6]. Adolescents, in contrast, are more likely to think that physical sensations have an internal cause (''my heart is beating faster and I'm just sitting here in class like I always do—I must be going crazy''). Based on this cognitive model and Piaget's theory of cognitive development, Nelles and Barlow [2] contend that adolescents are likely to develop PD because they are able to make the internal catastrophic attributions that seem necessary for a diagnosis of PD (''my heart is beating rapidly—I must be going crazy''). Nelles and Barlow [2] argued that children would not develop PD because they cannot make the internal, catastrophic attributions necessary for the development of PD.

Children and adolescents with PD describe physiological symptoms that are similar to those found with adults: palpitations, shaking, shortness of breath, nausea, hot and cold flashes, dizziness, and sweating [13, 14, 17, 18]. These studies also provide evidence that some children and adolescents with PD describe ''catastrophizing'' cognitive symptoms like fear of dying or going crazy. Across all studies, physiological symptoms were far more frequent than cognitive symptoms and adolescents were more likely to report cognitive symptoms than prepubertal children. Overall, existing research suggests that the characteristics of panic attacks in children and adolescents are similar to those of adults [6].

There is surprisingly little information about agoraphobia in youngsters with PD. In a sample of 17 youngsters diagnosed with PD with agoraphobia, Biederman et al. [12] reported that the most common symptoms of agoraphobia were endurance of the situation with intense anxiety and the need to be accompanied by a companion. A majority of these youngsters also exhibited an extreme fear of being alone at home. Kearney et al. [17] found a somewhat different pattern of avoidance behaviors in a sample of 18 youngsters who were diagnosed with PD with agoraphobia. In this study, the most commonly avoided situations involved settings with groups of people who were unknown to the child (e.g., restaurants, crowds, elevators, parks, stores). Despite a high frequency of avoidance behaviors, Kearney et al. [17] reported that the severity of this avoidance was not substantial.

The findings by Kearney et al. [17] raise the question of whether PD (with or without agoraphobia) produces significant impairment in daily functioning in children and adolescents. Although childhood onset of PD is associated with greater impairment in adults [19], it is possible that impairment is not evident until years after the onset of this disorder. Indeed, Ollendick [20] reported that adolescents with PD did not seek treatment in the early stages of their attacks, even though the

attacks produced considerable distress for them. When these adolescents finally sought treatment, it was a few years after the onset of PD, and only after agoraphobic avoidance produced significant impairment in their daily functioning. The absence of significant impairment in daily functioning among adolescents and children may explain why PD is not identified until several years after the onset of the disorder [6, 19].

Even when youngsters are referred for treatment, PD often is not detected during general clinical evaluations [11, 21]. One possible explanation for this is that PD in children and adults has a high rate of comorbidity with other anxiety disorders, as well as depression and behavioral problems [3, 22]. Indeed, up to 90% of children and adolescents with PD are diagnosed with another anxiety or mood disorder [3]. The high levels of comorbidity may mask or obscure the presence of PD in children and adolescents.

Even though it is clear that children and adolescents develop PD, methodological shortcomings limit the conclusions that can be drawn from the extant research [1, 6]. To date, studies have had small sample sizes and very few have used structured clinical interviews to establish the diagnosis of PD [9, 12–14, 17]. Despite the evidence of substantial rates of comorbidity, investigators have rarely conducted extensive evaluations that included both diagnostic measures and validated measures of internalizing and externalizing symptoms (for exceptions [17, 23]). Finally, Kearney and Silverman [1] and Ollendick et al. [6] encouraged investigators to include parent- and teacher-report measures in studies of PD in children and adolescents. Grills and Ollendick [24] pointed to the need for research that more closely approximates practitioner procedures in assessing psychopathology in children and adolescents.

The present study will examine the symptoms of panic and agoraphobia in a sample of clinically referred children with PD. Rates of comorbid diagnoses will be reported, as well as data from several measures of internalizing and externalizing symptoms. Finally, information regarding the primary reason for seeking treatment and any prior treatment for PD will be presented. We hypothesized that physical symptoms of panic would be reported more frequently than the cognitive symptoms of panic. We also hypothesized that adolescents would report a higher frequency of cognitive symptoms of panic than would younger children. Finally, we hypothesized that significant comorbidity between PD and other internalizing and externalizing disorders would be found [25].

Method

Participants and Procedure

This was a naturalistic study based on a clinical database. The sample was accrued by consecutive case ascertainment unselected for any specific psychiatric disorder. All children and adolescents who were referred to the outpatient Pediatric Psychopharmacology Clinic at the University of Massachusetts Medical School between 1995 and 2003 were systematically evaluated for psychopathology. Evaluations included child psychiatrist-completed clinical and structured diagnostic interviews using the Schedule for Affective Disorders and Schizophrenia for School Age

Children—Epidemiologic Version (K-SADS [26]). Diagnoses were assigned based on maternal-report data from the K-SADS. In this study, maternal report was emphasized because self-reporting of child moods and symptoms is not considered to be reliable and valid when children are less than 11 years old [27, 28].

Children completed several self-report rating scales and parents and teachers completed rating scales assessing the child's behavior. Parents and legal guardians provided clinical consent for all evaluation procedures. The study was approved by the University of Massachusetts Medical Center's Institutional Review Board. Children with autism, pervasive developmental disorder, mental retardation (IQ < 70), or unstable medical or neurological illness were excluded from the study.

Of 280 children and adolescents consecutively evaluated in this clinic, 35 (23 male, 12 female) were diagnosed with PD according to maternal-report DSM-IV criteria [29]. The mean age of the youngsters with PD was 11.6 years (SD = 2.93). Diagnoses were obtained from the K-SADS and were made for current episodes (6 months prior to the current evaluation) and lifetime episodes (any time before the last 6 months). With regard to racial background, 83% of the PD youth were Caucasian and 11% were Hispanic. Most children were living with their biologic mother (77%) and father (63%). Mothers' mean number of years of education was 14.3 years (SD = 2.9). Fathers' mean number of years of education was 13.6 years (SD = 2.4). With regard to annual family income, 28% of families earned less than $40,000, 19% earned $40,000–$49,000, 25% earned $50,000–$75,000, and 28% earned more than $75,000. In order to examine developmental issues in the phenomenology of PD and agoraphobic avoidance, the sample was divided into two age groups: preadolescent youth (6–12 years old; N = 23; M = 9.91 years, SD = 1.7), and adolescent (13–18 years old; N = 12; M = 14.83 years, SD = 1.9).

The total clinic sample was comprised of 202 boys (72%) and 78 girls (28%). The mean age of the total clinic sample was 10.5 years (SD = 3.4). Externalizing disorder diagnoses were very common in this sample (ADHD = 77%, oppositional defiant disorder = 50%, conduct disorder = 19%). Almost half (48%) of the youngsters referred to this clinic were diagnosed with a depressive disorder (major depression, dysthymia). With regard to anxiety disorders, 50% of these youngsters were diagnosed with generalized anxiety disorder, 35% with separation anxiety disorder, 30% with social phobia, 9% with obsessive compulsive disorder, and 7% with PTSD.

Measures

K-SADS

A board certified child psychiatrist administered the K-SADS [26] individually to the parent or guardian about the referred child. A total of five child and adolescent psychiatrists conducted the interviews. Interrater reliability for diagnosis was assessed using the Kappa statistic [30] in a subsample of 53 children by two child psychiatrists. These psychiatrists listened to audiotapes of the parent interview (N = 23) or observed the interview directly (N = 30). Interrater reliability was high (K = 0.87) for all diagnoses (current and lifetime). Interrater reliability for individual diagnoses was as follows: ADHD (K = 0.85), conduct disorder (K = 1.0), oppositional defiant disorder (K = 1.0), tic disorder (K = 1.0), separation anxiety

disorder ($K = 0.92$), panic disorder ($K = 0.89$), social phobia ($K = 0.85$), generalized anxiety disorder ($K = 0.88$), obsessive compulsive disorder ($K = 1.0$), major depression ($K = 0.84$), and bipolar disorder ($K = 0.79$). The presence of individual panic symptoms during panic attacks and the presence of agoraphobia symptoms was ascertained from the PD section of the K-SADS.

In addition to DSM-IV diagnosis, the child psychiatrist rated impairment using the Clinical Global Assessment Scale, which is a reliable measure of daily functioning and impairment [31, 32]. Agreement on this scale was measured with the intraclass correlation coefficient (ICC [33]) between child psychiatrists for 50 children. Agreement on this measure was good (ICC = 0.74). Severity of illness was assessed using the psychiatrist-rated Clinical Global Impressions (CGI) Severity Scale [34]. The CGI is a 7-point rating scale that ranges from (1) ''no signs of illness'' to (4) ''moderately ill'' to (7) ''extremely ill.''

Parent-report Measure

Parents also completed the Child Behavior Checklist (CBCL [35]), which is a widely used parent-report measure of children's behavioral and emotional problems. The CBCL contains two broad-band scales (Internalizing Problems, Externalizing Problems) and eight narrow-band scales (Anxious/Depressed, Withdrawn, Somatic Complaints, Social Problems, Thought Problems, Delinquent Behavior, Attention Problems, and Aggressive Behavior). A Total score also can be calculated. For this study, *T*-scores are reported.

Teacher-report Measure

The Teacher Report Form (TRF [36]) is the teacher-completed version of the CBCL. The TRF is designed to be used by teachers to rate children's behavioral and emotional problems in the classroom setting. This scale was completed for children aged 5 years or older. Like the CBCL, the TRF provides two broad-band scales and eight narrow-band scales.

Child Self-report Measures

The Youth Self-Report [37] is a 113-item measure of children's behavioral and emotional problems. This scale was completed by children aged 11 years or older. The YSR, which is a companion to the CBCL, provides two broad-band scales and eight narrow-band scales.

Data Analysis Strategy

The frequency of DSM-IV panic and agoraphobia symptoms and the frequency of comorbid diagnoses will be presented as percentages. Chi square tests were used to examine whether there were developmental differences in the occurrence of DSM-IV panic and agoraphobia symptoms.

Results

Panic Symptoms

The prevalence of PD in this sample of consecutively referred children and adolescents was 13%. The most common panic symptoms involved somatic complaints such as palpitations, nausea, trembling, and shortness of breath. (Frequencies for DSM-IV panic symptoms are presented in Table 1.) However, cognitive symptoms were not uncommon: fear of losing control was reported for 40% of the sample and fear of dying was reported for 23%. With regard to other PD criteria, 46% of the youngsters were reported to exhibit persistent concern about having another panic attack, 54% were reported to worry about the implications or consequences of the panic attack, and 51% were reported to exhibit a significant change in behavior related to the attacks. The mean age of onset of PD was 9.9 years (SD = 2.8, N = 32) and the mean number of panic episodes (separated by at least 2 months) was 2.0 (SD = 1.9, N = 28). The mean duration of the PD episode that parents rated as the most severe was 46.0 weeks (SD = 49.2, N = 29).

Comparison of the frequencies of panic symptoms for prepubertal youngsters and adolescents indicated that only the feeling of going crazy differentiated the groups. Adolescents were more likely to experience feelings of going crazy than the 6- to 12-year-old children, χ^2 (1) = 4.47, $P < 0.05$.

Agoraphobic Avoidance

Approximately 45% (N = 16) of the youngsters with PD also met criteria for the diagnosis of agoraphobia. The mean age at the onset of agoraphobia was 7.2 years (SD = 3.1, N = 13) and the mean number of agoraphobia episodes was 1.9 (SD = 1.5, N = 13). The mean duration of the agoraphobia episode that parents rated as the most severe was 58.4 weeks (SD = 90.1 weeks, N = 11). With respect to age, 43% (N = 10) of the 6- to 12-year-old group and 50% (N = 6) of the 13- to 18-year-old group were diagnosed with agoraphobia. There were no significant age differences in the diagnosis

Table 1 Frequency of panic symptoms

Symptoms	Total sample (N = 35) (%)	6–12 years old (N = 23) (%)	13–18 years old (N = 12) (%)
Palpitations	77	78	75
Nausea	71	65	83
Trembling	67	61	75
Shortness of breath	60	65	50
Hot/cold flashes	46	52	33
Sweating	43	39	50
Choking	40	35	50
Feeling faint	43	30	67
Fear of losing control/going crazy	40	26	67*
Chest pain	34	35	33
Numbness	23	17	33
Fear of dying	23	17	33
Depersonalization	17	13	25

* $P < 0.05$

of agoraphobia, χ^2 (1) = 0.13, NS. Youngsters with agoraphobia most commonly avoided being home alone or being outside alone. Moreover, most of these children were reported to need a companion when traveling away from home and they endured situations that could not be avoided with intense anxiety. Comparison of age differences in agoraphobic symptoms revealed one significant difference. Younger children were more likely to avoid elevators than adolescents, χ^2 (1) = 5.08, $P < 0.05$. (Frequencies for agoraphobia symptoms are presented in Table 2.)

Comorbidity

Comorbid diagnoses are presented in Table 3. With one exception, every child in this sample was diagnosed with 2 or more anxiety disorders. The mean number of anxiety diagnoses was 4.0 (*SD* = 1.3). The most common comorbid anxiety disorder diagnoses were separation anxiety disorder (89%) and generalized anxiety disorder (86%). Comorbid mood disorders were common; 57% of the youth were diagnosed with major depression or dysthymia and 26% of the children were diagnosed with mania or hypomania.

A large percentage of the youngsters were diagnosed with externalizing disorders. ADHD (81%) and oppositional defiant disorder (57%) were the most commonly diagnosed externalizing disorders. Diagnoses of conduct disorder and substance abuse were less common in this sample. Overall, 89% of the youth with PD were diagnosed with a comorbid externalizing disorder (*M* number of externalizing disorder diagnoses = 1.57; *SD* = 0.81). When internalizing and externalizing disorders were considered together, the mean number of diagnoses (including PD) for this sample was 6.5 (*SD* = 1.6).

Prior Treatment for PD and Primary Reason for Referral

With respect to previous treatment for PD, 13 youngsters had received outpatient treatment. Only one child had received outpatient treatment for agoraphobic avoidance. All 13 youngsters had been treated for PD with SSRIs. Two other children (who had not been reported to have had prior treatment for PD) had been treated with antipsychotic medications for panic attacks. No child had received benzodiazepines for the treatment of PD. No child had received outpatient psychotherapy for PD.

Table 2 Frequency of agoraphobia symptoms

Symptoms	Total sample (*N* = 16) (%)	6–12 years old (*N* = 10) (%)	13–18 years old (*N* = 6) (%)
Endure with intense anxiety	75	90	50
Home alone	69	70	67
Accompany away from home	69	70	67
Outside alone	63	60	67
Travel restrictions	50	50	50
Crowded place	44	40	50
Travel in bus, car	38	30	50
Elevators	31	50	0*
Bridge/tunnel	13	20	0

* $P < 0.05$

Table 3 Comorbid diagnoses in children and adolescents with panic disorder

Anxiety disorders	
Separation anxiety	89%
Generalized anxiety disorder	86%
Specific phobia	43%
Social phobia	40%
Posttraumatic stress disorder	26%
Obsessive compulsive disorder	14%
Anxiety, not otherwise specified	6%
Mood disorders	
Major depression	40%
Dysthymia	17%
Adjustment disorder-depression	3%
Mania	20%
Hypomania	6%
ADHD	
Combined subtype	43%
Inattentive subtype	20%
Hyperactive subtype	9%
ADHD not otherwise specified	9%
Oppositional defiant disorder	57%
Conduct disorder	20%
Substance abuse	11%

Examination of the primary presenting problems or reasons for referral revealed that no child in this sample had been referred to this clinic for evaluation or treatment of panic disorder or agoraphobia. The most common presenting problems reflected concerns about ADHD ($N = 11$) or mood disorders (major depression = 5, dysthymia = 1, mania = 6, hypomania = 2). When anxiety was the principal concern, the presenting problems involved posttraumatic stress disorder ($N = 5$), separation anxiety ($N = 1$), or generalized anxiety disorder ($N = 1$).

Psychopathology and Behavioral Problems

Broad-band Measures

Parents, teachers, and children completed Achenbach's [35–37] behavioral rating scales. For the parent-report version of this rating scale, the mean CBCL Total score ($M = 72.4$) indicated significant levels of overall psychopathology (See Table 4). Parent ratings also indicated clinically significant levels of Internalizing symptoms. On the narrow-band Anxious/Depressed subscale, parents reported clinically significant levels of anxious and depressed symptomatology. Parents also reported clinically significant levels of symptomatology on the Thought Problems and Attention Problems subscales.

For the teacher-report version of this rating scale, the mean TRF Total score ($M = 62.0$) was within the normal range. Teacher ratings on both the narrow-band Anxious/Depressed subscale and the Internalizing subscale were within the normal range.

For the youth-report version of this rating scale, the mean YSR Total score ($M = 65.2$) was within the normal range. Youth ratings on both the broad-band Internalizing scale and the narrow-band Depressed/Anxious subscale were within the normal range.

Table 4 Means and standard deviations for Achenbach behavior rating scales

Scale	Parent-report	Teacher-report	Child-report
Total	72.69 (7.6)	62.03 (9.2)	65.22 (12.9)
Internalizing	71.54 (8.0)	60.00 (11.5)	63.33 (13.1)
Externalizing	66.17 (10.7)	58.78 (9.0)	62.61 (13.3)
Anxious/depressed	70.63 (14.8)	61.19 (7.7)	65.67 (10.2)
Withdrawn	66.06 (11.5)	59.00 (9.2)	59.50 (8.5)
Somatic problems	67.03 (8.1)	57.63 (9.4)	61.39 (7.4)
Social problems	67.31 (11.6)	60.06 (7.8)	61.56 (10.8)
Thought problems	71.4 (9.0)	62.06 (10.0)	62.72 (10.0)
Delinquent behavior	63.89 (10.0)	56.97 (7.0)	63.89 (12.0)
Aggressive behavior	67.49 (11.9)	59.87 (8.1)	63.11 (10.8)
Attention problems	74.37 (10.6)	63.81 (10.8)	64.11 (12.1)

Note: $N = 35$ for parent-report; $N = 32$ for teacher report; $N = 18$ for child-report

Standard deviations in parentheses

Psychiatrists' Ratings of Impairment

Psychiatrists rated daily functioning and impairment on the CGAS. Scores on this scale ($M = 46.9$, $SD = 6.4$) indicated clinically significant levels of impairment. Psychiatrists' ratings of overall severity of illness on the CGI ($M = 4.9$, $SD = 0.8$) also indicated clinically significant levels of symptomatology in this sample. CGI ratings indicated moderate to severe symptom levels.

Discussion

The present study examined the frequency of PD and agoraphobia among 280 children and adolescents who had been referred to an outpatient pediatric psychopharmacology clinic. The frequency of PD in this sample was 13%, which is consistent with other studies of children and adolescents [12–14, 17]. Physiological symptoms, especially palpitations, trembling, nausea, and shortness of breath, were the most frequently reported symptoms. Although cognitive symptoms were reported less often than physiological symptoms, cognitive symptoms were not uncommon. Fear of losing control was reported for 40% of the sample and fear of dying was reported for 23%. In addition to these panic attack symptoms, 54% of the youngsters were reported to worry about the implications or consequences of the panic attack, 51% were reported to exhibit a significant change in behavior related to the attacks, and 46% were reported to exhibit persistent concern about having another panic attack.

Approximately half of the youngsters with PD also met criteria for the diagnosis of agoraphobia. Youngsters with agoraphobia most commonly avoided being home alone or being outside alone. Most youngsters with agoraphobia were reported to need a companion when traveling away from home and they endured situations that could not be avoided with intense anxiety.

The onset of agoraphobic avoidance ($M = 7.2$ years) was earlier than the onset of panic ($M = 9.9$ years). The current findings, which are consistent with Biederman et al. [12], suggest that agoraphobia may be the developmental precursor of panic disorder in children and adolescents. This finding is inconsistent with the notion that

agoraphobia is a response to panic attacks [22, 29]. An alternative explanation is that parents recognize (and label) these avoidance behaviors in their children at a younger age and only later do parents become aware of the anxiety and panic. To resolve this issue, longitudinal research that carefully examines the development of panic symptoms and avoidance behavior in children is needed.

When developmental issues in the phenomenology of PD and agoraphobic avoidance were examined, it was noteworthy that there were very few age-related differences in this sample. With regard to panic symptoms, age differences were found for only one symptom: the feeling of going crazy. Compared to younger children, adolescents were more likely to experience the feeling of going crazy. For agoraphobia symptoms, younger children were more likely to avoid elevators than adolescents. The present results are consistent with Masi et al. [14], who also reported that there were very few differences between children and adolescents with PD. It should be noted that the sample size in this study was small and the analyses may not have had sufficient power to identify developmental differences in panic and agoraphobia symptoms.

Consistent with other research that has examined comorbidity [3], there was extensive comorbidity between PD and other internalizing and externalizing disorders. With reference to anxiety disorders, the youngsters in this sample tended to be diagnosed with several different anxiety disorders (the average number of anxiety disorder diagnoses was 4.0). In fact, only one youngster had PD without another anxiety disorder diagnosis. The most common comorbid diagnoses were separation anxiety disorder and generalized anxiety disorder. These findings are consistent with other research in suggesting a link between separation anxiety and PD [38–40].

There was a high frequency of comorbid mood disorders in this sample. A majority of youngsters was diagnosed with major depression or dysthymia. Other studies have reported similar rates of depressive disorders among children with PD [7, 11, 12, 14, 21, 41–43]. Another 26% of the youth in this sample was diagnosed with mania or hypomania. This finding is consistent with prior research in indicating that a significant proportion of children with PD also have bipolar disorder [12, 44, 45]. These findings also suggest that children and adolescents with more severe disorders may have higher rates of PD [43].

There was a surprisingly high rate of externalizing disorders in this sample. Almost 90% of the youth with PD were diagnosed with at least one externalizing disorder (the average number of externalizing diagnoses was 1.6). ADHD (81%) and oppositional defiant disorder (57%) were the most frequently diagnosed externalizing disorders. Although the co-occurrence of anxiety and externalizing disorders may seem counterintuitive, the present results are consistent with prior studies [23, 25]. Several studies found that anxiety disorders frequently co-occur with ADHD [12, 21, 46–48] and with conduct and oppositional defiant disorders [12, 21, 49]. Furthermore, some evidence suggests that youngsters who are referred to clinics that specialize in the treatment of anxiety disorders evidence lower rates of comorbid externalizing disorders than youngsters who are treated in community-based clinics [23, 25].

This co-occurrence of anxiety and externalizing disorders may reflect overlapping symptoms or diagnostic criteria. As noted by Schniering et al. [28], anxious children often experience difficulties concentrating because of excessive worry, and it is possible that such difficulties may be misdiagnosed as ADHD. Similarly, youngsters with PD (and agoraphobia) tend to avoid situations that elicit anxiety. This avoidance

behavior, which often involves the youngster's refusal to comply with parental demands, may be diagnosed as oppositional behavior [21].

It is notable that no child had been referred to this clinic for evaluation or treatment of PD or agoraphobia. The most common presenting problems reflected concerns about ADHD or mood disorders. When anxiety was the principal concern, the presenting problems involved posttraumatic stress disorder, separation anxiety disorder, or generalized anxiety disorder. Although this finding seems to indicate that parents (or other significant adults like teachers) were unaware of the child's anxiety problem, data concerning the youngster's previous treatment present a more complicated picture because 13 children (33%) had received prior outpatient treatment specifically for PD and another child received outpatient treatment for agoraphobia. All youngsters with prior treatment for PD had been treated with SSRIs. No child had received prior outpatient psychotherapy for PD or agoraphobia.

It appears that even though several youngsters had received previous pharmacotherapy specifically for PD, parents did not perceive PD or agoraphobia to be the most important problem or concern. The present data, however, offer little understanding of why parents did not identify PD as the presenting problem. One possibility is that coexisting problems were more distressing to parents or other adults. The youngsters in this sample exhibited multiple problems (the average number of DSM diagnoses was 6.2) and it may be that disorders like ADHD or mood disorders have features that are more distressing to parents.

Parent ratings on the CBCL [35] also show that parents were aware that their child was experiencing problems with anxiety because parents reported clinically significant levels of anxious and depressive symptoms. More generally, parent ratings on the broad-band Internalizing Scale indicated clinically significant levels of symptomatology. Parents also reported clinically significant levels of symptoms on the CBCL Attention Problems and Thought Problems subscales. These scales tap into problems like difficulty concentrating or distractability, which can be features of anxiety disorders as well as externalizing disorders like ADHD. It is important to note that parent ratings on the CBCL Aggressive Behavior and Delinquent Behavior subscales were within the normal range.

Psychiatrist ratings also indicated that these youngsters exhibited moderate to severe symptoms that were clinically significant. This is consistent with previous research in community samples where it was found that panic disorder was correlated with more severe levels of symptomatology. In other words, PD may be a risk factor for severe psychopathology [43].

In contrast to parent report, teacher ratings on the Teacher Report Form [36], which is the teacher-completed version of the CBCL, were all within the normal range. More specifically, teacher ratings on both the narrow-band Anxious/Depressed subscale and the broad-band Internalizing Scale were within the normal range. Similar findings were obtained for the youth self-report measure. Youth ratings on the Anxious/Depressed subscale and the broad-band Internalizing Scale were within the normal range.

Limitations

As with all studies, this project has some limitations that should be considered when evaluating these findings. A possible limitation may be a referral bias because the youngsters were referred to a pediatric psychopharmacology clinic at a university

hospital. Most children and adolescents referred to this clinic exhibited severe psychopathology and the findings may not generalize to other outpatient mental health or community settings. This clinic was not, however, a specialty clinic and no specific diagnosis or presenting problem was required for referral. Hence, the results are not biased by preselection on diagnosis or other research grounds.

Another issue that may be related to referral bias is that most youngsters in this sample were male. Although PD has been reported to be more prevalent among females [3], some studies that used clinic samples also had a majority of male participants [12, 14, 23]. It is well established that externalizing disorders are more common among boys, which may account for the high rate of co-occurring ADHD and oppositional defiant disorder in this clinic and the other clinics that did not specialize in the treatment of anxiety disorders [12, 23].

Another consideration is that the identification of panic and agoraphobia symptoms was based on parental reports of child symptomatology. Youngsters were not assessed with a structured diagnostic interview because these interviews tend to be rather lengthy and require information that was beyond the cognitive capabilities of many children who were referred to this clinic. Although there is disagreement about the relative value of child and parent report of children's anxiety symptomatology [28], reliance on parent report as the indicator of the child's anxiety symptoms may be viewed as a weakness. Even though some PD symptoms are likely to be observed by parents (e.g., sweating, choking, avoidance behaviors), parents may be unaware of other symptoms (e.g., fear of dying, palpitations, chest pain). As a result, these data may underestimate the frequency of panic symptoms that may be difficult to be observed by parents or other adults. The present study is not unique, however, in relying on parent report to assess childhood anxiety disorders. For example, Kendall et al. [50] and Southam-Gerow et al. [23] interviewed the parent and child, but similar to the present study, children's anxiety diagnoses were based entirely on parent report.

Clinical Implications

The frequency of PD in this sample was 13%. This finding is consistent with the results of other studies [12–14, 17], and indicates that PD and agoraphobia occur at a meaningful rate in child and adolescent mental health clinics. One of the most noteworthy findings of this study was that no youngster who had been diagnosed with PD had been referred to this clinic for evaluation or treatment of PD or agoraphobia. Instead, parents' concerns focused most often on ADHD or mood disorders.

An important clinical implication is that PD can be identified in children and adolescents when systematic assessment methods are used. Even though parents did not initially identify PD as a concern, with systematic inquiry that was guided by a semi-structured interview, these parents readily described their child's symptoms of panic and agoraphobia. Similarly, parent ratings on the CBCL, which provides broad-band ratings of the child's negative affect and related internalizing symptoms, indicated that parents were aware that their child was experiencing problems with anxiety, even when this was not the presenting problem.

There was extensive comorbidity between PD and other internalizing and externalizing disorders. The extensive comorbidity with other disorders may be one reason that PD is frequently overlooked in children. If PD is viewed as a rare disorder, clinicians are unlikely to ask about panic or agoraphobia symptoms when their patients exhibit other problems.

The co-occurrence of internalizing disorders is widely recognized and youngsters with PD tended to experience multiple anxiety disorders. This suggests that anxious children should be screened routinely for PD and agoraphobia. It is especially noteworthy that such a large number of these youngsters were diagnosed with an externalizing disorder. Although internalizing disorders like PD are often viewed as separate from externalizing disorders like ADHD, several studies indicate that anxiety disorders frequently co-occur with externalizing disorders [23, 25]. The present findings indicate that the diagnosis of disruptive behavior disorders like ADHD or oppositional defiant disorder does not preclude the occurrence of PD and agoraphobia. Careful and systematic assessment of both internalizing and externalizing disorders is warranted, even when parents focus initially on disruptive behavior disorders.

Summary

PD was initially considered to be an adult disorder, but recent research indicates that some children and adolescents do experience this disorder [3–6]. Now that PD has been documented in children and adolescents, research has turned to examining the symptoms and characteristics of PD in children and adolescents. The present study examined the symptoms of panic and agoraphobia in a sample of children and adolescents who had been referred to an outpatient pediatric psychopharmacology clinic at a university medical center. All youngsters referred to this clinic were systematically evaluated using a psychiatrist-completed semi-structured diagnostic interview. In addition, children completed standardized self-report scales and parents and teachers completed rating scales assessing the child's behavior. The prevalence of PD in this sample was 13%. The most common panic symptoms involved somatic complaints; cognitive symptoms, however, were not uncommon. Approximately half of the youngsters with PD also met the criteria for the diagnosis of agoraphobia. There was extensive comorbidity between PD and other internalizing and externalizing disorders. Along with other anxiety disorders, there was a high frequency of comorbid mood disorders. Furthermore, there was a surprisingly high rate of comorbid externalizing disorders. It was notable that no child who was diagnosed with PD had been referred to this clinic for evaluation or treatment of PD or agoraphobia. Instead, the most common presenting problem reflected parents' concerns about ADHD or mood disorders. Overall, these findings indicate that PD and agoraphobia occur at a meaningful rate in child and adolescent mental health clinics. PD tends to co-occur with other disorders and may be overlooked because parents tend to identify other problems as the most distressing problem. However, with systematic assessment, PD and agoraphobia can be identified in children and adolescents.

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