Eur Child Adolesc Psychiatry (2006)
15:199–206 DOI 10.1007/s00787-005-0522-3

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Suicidal ideation, deliberate self-harm behaviour and suicide attempts among adolescent outpatients with depressive mood disorders and comorbid axis I disorders

Accepted: 5 December 2005 /
Published online: 8 April 2006

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Abstract *Objective* We aimed to analyse and compare prevalence and associated clinical features of suicidal ideation, self-harm behaviour with no suicidal intent and suicide attempts among adolescent outpatients with depressive mood disorders with or without comorbidity. *Method* A sample of 218 consecutive adolescent outpatients aged 13–19 years with depressive mood disorders was interviewed using K-SADS-PL for DSM-IV Axis I diagnoses. They filled out self-report questionnaires assessing depressive and anxiety symptoms. Suicidal behaviour was assessed by K-SADS-PL suicidality items. *Results* Half of the subjects reported suicidal ideation or behaviour. There was no difference in prevalence of suicidal behaviour between non-comorbid and comorbid mood disorder groups. Multivariate logistic regression analyses produced the following associations: (1) suicidal ideation with self-reported depressive symptoms and poor psychosocial functioning, (2) deliberate self-harm behaviour with younger age and poor psychosocial functioning, and (3) suicide attempts with self-reported depressive symptoms and poor psychosocial functioning. *Conclusions* Depressed mood disorders, whether comorbid or not, are associated with suicidal ideation and suicide attempts. Diagnostic assessment should be supplemented by self-report methods when assessing suicidal behaviour in depressed adolescents.

Key words suicidality – adolescence – mood disorder – comorbidity

Introduction

Depressive disorders are among the most prevalent psychiatric problems seen in adolescent psychiatric services, with approximately 30–50% of outpatients suffering from a depressive mood disorder [32, 39]. Studies on adolescent depression both in community and clinical samples report high prevalence (40–70%) of comorbid disorders [3, 5, 14, 28, 32, 33]. Anxiety disorders are the most common comorbid disorders in youthful depression, affecting up to three-fourths of depressed youngsters [23, 28, 31, 35]. In general, comorbidity in adolescent depression is associated with psychosocial impairment [33], with a higher risk

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for recurrence of depressive episodes, and increased use of mental health services [1, 32, 41].

While depressive disorders are among the most powerful predictors of suicidal ideation and suicide attempts in adolescents [4, 32, 34], the risk of suicidal ideation and suicide attempts further increases when depression is comorbid with disruptive behaviour, substance use and anxiety [6, 13, 25, 32, 50]. Recent studies suggest that self-harm behaviour, defined as a direct, socially unaccepted, repetitive behaviour that causes minor to moderate physical injury [29, 48], is also a risk factor for suicide attempts [21, 22, 51]. The association between self-harm behaviour and depressive disorders has been little studied [37].

Although anxiety disorders are the most common comorbid disorder in adolescent depression, research on their significance for suicidal behaviour seems inconsistent. Some studies have reported anxiety disorders as risk factors for suicidal ideation and suicide attempts [17, 20, 47]. Comorbid anxiety disorders in adolescent depressive disorders have been associated with increased suicidal ideation and suicide attempts in community samples [13, 17, 50]. On the other hand, clinical studies have reported anxiety disorders not to be risk factors for suicide attempts whether comorbid or not [4, 6, 47]. Besides diagnosed anxiety disorders previous research suggests that also symptoms of anxiety are associated with suicidal behaviour [12, 17]. One explanation of the inconsistent findings may be the variability in methods in measuring suicidal behaviour e.g. self-report questionnaires in some studies [13, 17, 49] and standardised structured interviews in others [32, 50]. Previous studies have not assessed simultaneously the whole spectrum of suicidal behaviours including suicidal ideation, deliberate self-harm behaviour and suicide attempts.

The aim of the present study was to analyse the prevalence, gender- and age differences, and associated clinical characteristics of suicidal ideation, self-harm behaviour with no suicidal intent and suicide attempts among adolescent outpatients suffering depressive disorders with no comorbidity compared to those with comorbid disorders. Suicidal behaviour was expected to be more common and severe among adolescents with depressive disorders with comorbidity.

Methods

Subjects and procedure

This study forms part of the Adolescent Depression Study (ADS), a collaborative study between the Department of Adolescent Psychiatry of the Peijas Medical Health Care District (PMCD) of Helsinki University Central Hospital and the Department of Mental Health and Alcohol Research in the National Public Health Institute, Helsinki, Finland. The study population was drawn from the two adolescent psychiatric outpatient clinics of the PMCD between February 1st 1998 and December 31st 2001. Of the eligible 660 outpatients, 624 (94.5%) were screened during their first consultation visit with the Beck Depression Inventory (BDI-21) [8] and the General Health Questionnaire-36 (GHQ-36) [18]. The 373 patients with scores of 10 or more in the BDI-21 and 5 or more in the GHQ-36 were considered screen-positive and asked to participate in the study. At this point 118 (31.6%) outpatients refused and 34 (9.1%) dropped out. Refusal/dropping out was unrelated to sex ($\chi^2 = 2.08$, df = 1, $P = 0.15$), age group ($\chi^2 = 2.37$, df = 1, $P = 0.12$) and parental SES (1 = working class, 2 = lower middle class, 3 = upper middle class, 4 = other) ($\chi^2 = 5.59$, df = 3, $P = 0.13$), while it associated with lower BDI-21 (19.0 vs. 21.0, $z = -1.93$, df = 371, $P = 0.05$) and lower GHQ-36 (21.0 vs. 24.0, $z = -1.98$ df = 367, $P = 0.05$) median sum scores. The 221 remaining outpatients were evaluated by diagnostic interview (Schedule for Affective Disorders and Schizophrenia for School-Aged Children – Present and Life-time, K-SADS-PL) [27] and the 218 diagnosed with a current depressive mood disorder were included in the study. The subjects' mean age was 16.4 (SD 1.6, range 13–19 years), 18% ($n = 40$) were males and 82% ($n = 178$) females.

In all, 72% ($n = 157$) had one or more Axis I disorder in addition to a mood disorder. Comorbidity with anxiety disorders ($n = 125$, 57%) was most common, with 20% ($n = 43$) of the subjects having an anxiety disorder plus at least one other comorbid disorder. Fifteen percent ($n = 32$) had other comorbidity (substance use disorder ($n = 18$, 56.2%), eating disorder ($n = 6$, 18.8%), disruptive disorder ($n = 12$, 37.5%) excluding anxiety disorders. Comorbidity was unrelated to parental SES (1 = working class, 2 = lower middle class, 3 = upper middle class, 4 = other) ($\chi^2 = 7.823$, df = 9, $P = 0.552$).

Diagnostic interview

Nine researchers, also experienced clinicians, conducted the diagnostic interviews. K-SADS-PL, a semi-structured interview with high reliability and validity [27, 45], was used to assess DSM-IV Axis I disorders. All the research diagnoses were confirmed in a subsequent diagnostic meeting. Inter-rater reliability, assessed using 15 randomly selected videotaped interviews, was good for mood disorder diagnoses (weighted kappa [16, 44] for MDD, other mood disorder, no mood disorder 0.87(95% CI 0.81,0.93)). Patients were classified as suffering a comorbid psychiatric disorder if they had one or more non-affec-

tive Axis I diagnosis in addition to the depressive mood disorder.

Psychosocial functioning (Global Assessment of Functioning, GAF) was assessed according to the DSM-IV Axis V definitions [2]. A GAF rating score from 1 (most impaired) to 100 (least impaired) was assigned, with descriptors provided for each 10-point interval. To determine the rating, the researcher selected the 10-point interval that best described the patient's functioning and then used his or her judgement to assign an exact rating within that interval. In data analyses, the GAF score was treated as a continuous variable.

The time of onset of a disorder was identified as the time point when the minimum requirements for each DSM-IV diagnosis were simultaneously present. Probing questions were used to obtain the best possible accuracy. The duration of the current depressive disorder indicates the number of months the current depressive episode had persisted prior to the screening date. In data analyses, the time of onset and duration of the current depressive disorder were treated as continuous variables.

The subjects were classified into four groups according to psychiatric comorbidity: 1. subjects with depressive disorder without comorbidity, 2. subjects with a depressive disorder and an anxiety disorder, 3. subjects with a depressive disorder, an anxiety disorder and other comorbid disorders, and 4. subjects with a depressive disorder and other comorbid disorders excluding anxiety disorders.

Suicidal behaviour

Suicidal behaviour was determined using four questions from the screening section of the K-SADS-PL diagnostic interview relating suicidal thoughts ("1" = none, "2" = occasional, "3" = frequent), suicide attempts and their seriousness ("1" = none, "2" = ambivalent, "3" = serious), suicide attempts and their lethality ("1" = none, "2" = not life-threatening, "3" = life-threatening), and deliberate self-harm behaviour without intent to die ("1" = none, "2" = occasional, "3" = frequent). Based on these questions, four mutually exclusive subgroups of suicidal behavior present during the most severe phase of the current mood disorder episode were constructed: (1) subjects coded "1" or "2" in all items were coded "non-suicidal", (2) "suicidal ideation" consisted of subjects who had suicidal thoughts frequently ("3") but had not attempted suicide, (3) the "deliberate self-harm behaviour "group included subjects who had frequent deliberate self-harm ("3") and (4) the "suicide attempts" group consisted of adolescents who had made one or more serious or life-threatening suicide attempts ("3"). Suicidal behaviour was coded according to the most serious behaviour reported. Thus e.g. a subject with both deliberate self-harm behaviour and suicide attempt was classified in the "suicide attempt" group. Suicidal behaviour was unrelated to parental SES ($\chi^2 = 7.562$, df = 9, $P = 0.579$).

Measurement of depressive and anxiety symptoms

Depressive symptoms were assessed using the Beck Depression Inventory-21 (BDI-21) [8]. The BDI-21 is a standardised 21-item questionnaire, a well-studied screen for youthful depression [10, 38]. The adolescent was asked to rate how much he or she had been bothered by each symptom on a 4-point scale ranging from 0 (not at all) to 3 (severely).

Anxiety symptoms were assessed using the Beck Anxiety Inventory (BAI) [7]. The Beck Anxiety Inventory is a 21-item self-report measure of anxiety symptoms, validated both in adults and adolescents [7]. The adolescent was asked to rate how much he or she had been bothered by each symptom over the past week on a 4-point scale ranging from 0 (not at all) to 3 (severely).

The Beck Depression Inventory-21 and the Beck Anxiety Inventory were introduced to the adolescents during the first consultation visit.

Data analyses

SPSS 11.0 software was used in data analyses [46]. The group comparisons were analysed using the Chi Square and Fisher's Exact test. Non-parametric descriptive statistics were applied for non-normally distributed numerical variables (Kruskall–Wallis, Mann–Whitney *U*). Equality of the means was tested using the one-way analysis of variance (ANOVA). Post hoc subgroup differences were compared using the Bonferroni procedure, with 0.05 as the level of significance in multiple comparisons. To analyse factors associated with different kinds of suicidal behaviour (dependent variable) and to get the most important predictors, a multivariate logistic regression analysis using a backward selection procedure was performed. *P*-values < 0.05 and odds ratios (OR) with lower 95% confidence intervals (95% CI) > 1 were considered statistically significant.

Results

Prevalence of suicidal behaviour by gender and age

Half of the adolescents reported suicidal ideation or behaviour, 19% had only suicidal ideation, 13% had

Table 1 Characteristics of adolescent outpatients with mood disorder according to suicidal behaviour

	No suicidality	Suicidal ideation	Deliberate self-harm behaviour	Suicide attempts	Total
Females (n%)[a]					
13–15 years	25 (45.5)	6 (10.9)	13 (23.6)	11 (20.0)	55 (100.0)
16–19 years	65 (52.8)	26 (21.1)	11 (8.9)	21 (17.1)	123 (100.0)
Total	90 (50.6)	32 (18.0)	24 (13.5)	32 (18.0)	178 (100.0)
Males (n%)[a]					
13–15 years	6 (60)	1 (10.0)	2 (20.0)	1 (10.0)	10 (100.0)
16–19 years	16 (53.3)	9 (30.0)	3 (10.0)	2 (6.7)	30 (100.0)
Total	22 (55.0)	10 (25.0)	5 (12.5)	3 (7.5)	40 (100.0)
All subjects (n%)					
13–15 years[b]	31 (47.7)	7 (10.8)	15 (23.1)	12 (18.5)	65 (100.0)
16–19 years[b]	81 (52.9)	35 (22.9)	14 (9.2)	23 (15.0)	153 (100.0)
Total	112 (51.4)	42 (19.3)	29 (13.3)	35 (16.1)	218 (100.0)
BDI-21 score,[c] Mean, (SD)	19.5 (7.6)	25.8 (8.8)	22.2 (9.5)	27.5 (10.5)	22.4 (9.2)
BAI score,[d] Mean, (SD)	20.1 (12.2)	25.9 (13.0)	21.2 (11.2)	26.7 (12.5)	22.4 (12.5)
GAF score,[e] Mean, (SD)	55.3 (9.7)	49.0 (9.1)	49.9 (9.5)	45.3 (11.8)	51.8 (10.6)

[a]Difference between females and males, $\chi^2 = 3.218$, df = 3, $P = 0.359$
[b]Difference between younger and older adolescents, $\chi^2 = 10.700$, df = 3, $P = 0.013$
[c]$F = 10.454$, df = 3, $P = 0.000$
[d]$F = 3.594$, df = 3, $P = 0.015$
[e]$F = 11.028$, df = 3, $P = 0.000$

deliberate self-harm behaviour and 16% had attempted suicide. There were no gender differences in the types of suicidality (χ^2 = 3.218, df = 3, P = 0.359) (Table 1).

Suicidal ideation was more common among subjects aged 16–19 years (23%) compared to those aged 13–15 years (11%), while deliberate self-harm behaviour was more common among younger than older subjects (23% vs. 9%, respectively), (χ^2 = 10.700, df = 3, P = 0.013) (Table 1).

Clinical characteristics of adolescents with suicidal behaviour

The severity of depressive symptoms as measured by the BDI-21 differed significantly between the four suicidal behaviour groups ($F = 10.454$, df = 3, $P = 0.000$) (Table 1). In subgroup comparisons adolescents with suicidal ideation or attempted suicide had significantly higher levels of depressive symptoms than those with no suicidal behaviour ($P = 0.001$, $P = 0.000$, respectively).

The severity of anxiety symptoms as measured by the BAI also differed significantly between the four suicidal behaviour groups ($F = 3.594$, df = 3, $P = 0.015$) (Table 1). Subgroup analyses showed that the difference was due to higher anxiety symptom scores among adolescents who had attempted suicide compared with non-suicidal adolescents ($P = 0.049$).

Psychosocial functioning differed significantly between the suicidal behaviour groups ($F = 11.028$, df = 3, $P = 0.000$) (Table 1). In subgroup comparisons adolescents who had suicidal ideation or who had attempted suicide had lower psychosocial functioning than non-suicidal adolescents ($P = 0.004$, $P = 0.000$, respectively).

The frequencies of the subgroups of suicidal behaviour did not differ significantly between the four depressive disorder groups ($\chi^2 = 7.708$, df = 9, $P = 0.564$) (Table 2). There were no differences in the frequencies of the three types of suicidal behaviours between non-comorbid and comorbid depressive disorder groups, either by gender (males: $\chi^2 = 3.635$, df = 3, $P = 0.304$, females: $\chi^2 = 5.197$, df = 3, $P = 0.158$) or age (13–15 years: $\chi^2 = 0.238$, df = 3, $P = 0.971$, 16–19 years: $\chi^2 = 0.328$, df = 3, $P = 0.507$).

Mean age of onset of the first mood disorder episode was 13.1 years (SD 3.16) among non-suicidal adolescents, 13.6 years (SD 2.87) among those with suicidal ideation, 13.3 years (SD 1.99) among those with deliberate self-harm and 13.4 (SD 2.43) among adolescents who had attempted suicide. Age of onset was not significantly associated with the four suicidal behaviour groups ($F = 0.236$, df = 3, $P = 0.871$). Mean duration of current depressive disorder was 16 months (median 6.3) among non-suicidal adolescents, 24 months (median 6.3) among those with suicidal ideation, 12 months (median 6.5) among those with deliberate self-harm, and 22 months (median 10.7) among adolescents with a suicide attempt. Duration of the current mood disorder episode was not associated with the four suicidal behaviour groups ($\chi^2 = 4.705$, df = 3, $P = 0.195$).

Table 2 Suicidal behaviour in adolescent outpatients with depressive mood disorders with or without comorbidity

	No suicidality (*n*,%)	Suicidal ideation (*n*,%)	Deliberate self-harm behaviour (*n*,%)	Suicide attempts (*n*,%)
Mood disorder category				
Non-comorbid disorders				
Females[a]	21 (23.3)	7 (21.9)	10 (41.7)	12 (37.5)
Males[a]	8 (36.4)	2 (20.0)	0	1 (33.3)
13–15 years[b]	10 (32.3)	2 (28.6)	5 (33.3)	4 (33.3)
16–19 years[b]	19 (23.5)	7 (20.0)	5 (35.7)	9 (39.1)
Total	29 (25.9)	9 (21.4)	10 (34.5)	13 (37.1)
Comorbid with anxiety disorders				
Females[c]	39 (43.3)	17 (53.1)	6 (25.0)	7 (21.9)
Males[c]	5 (22.7)	3 (30.0)	3 (60.0)	2 (66.7)
13–15 years[d]	10 (32.3)	4 (57.1)	4 (26.7)	3 (25.0)
16–19 years[d]	34 (42.0)	16 (45.7)	5 (35.7)	6 (26.1)
Total	44 (39.3)	20 (47.6)	9 (31.0)	9 (25.7)
Comorbid with anxiety and other disorders				
Females[e]	16 (17.8)	7 (21.9)	4 (16.7)	7 (21.9)
Males[e]	5 (22.7)	3 (30.0)	1 (20.0)	0
13–15 years[f]	5 (16.1)	1 (14.3)	1 (6.7)	3 (25.0)
16–19 years[f]	16 (19.8)	9 (25.7)	4 (28.6)	4 (17.4)
Total	21 (18.8)	10 (23.8)	5 (17.2)	7 (20.0)
Comorbid with other disorders				
Females[g]	14 (15.6)	1 (3.1)	4 (16.7)	6 (18.8)
Males[g]	4 (18.2)	2 (20.0)	1 (20.0)	0
13–15 years[h]	6 (19.4)	0	5 (33.3)	2 (16.7)
16–19 years[h]	12 (14.8)	3 (8.6)	0	4 (17.4)
Total	18 (16.1)	3 (7.1)	5 (17.2)	6 (17.1)

[a] $\chi^2 = 4.955$, df = 3, $P = 0.175$
[b] $\chi^2 = 1.717$, df = 3, $P = 0.633$
[c] $\chi^2 = 2.974$, df = 3, $P = 0.396$
[d] $\chi^2 = 2.450$, df = 3, $P = 0.484$
[e] $\chi^2 = 2.401$, df = 3, $P = 0.494$
[f] $\chi^2 = 2.466$, df = 3, $P = 0.481$
[g] $\chi^2 = 5.051$, df = 3, $P = 0.168$
[h] $\chi^2 = 9.580$, df = 3, $P = 0.022$

Multivariate analyses

Multivariate logistic regression analyses were conducted using a backward selection procedure for each of the suicidal behaviour groups (suicidal ideation only, deliberate self-harm behaviour and suicide attempts) versus non-suicidal adolescents. All models were performed to simultaneously control the effects of comorbid Axis I disorders, age, gender, severity of depression and anxiety symptoms, psychosocial functioning, age of onset of the first mood disorder episode and duration of the current mood disorder episode.

The significant variables for having suicidal ideation compared with no suicidality were depressive symptoms and poor psychosocial functioning (Hosmer–Lemeshow Goodness-of-Fit $\chi^2 = 3.446$, df = 8, $P = 0.903$, model classified correctly 76.8% of the subjects) (Table 3). The significant predictors for having deliberate self-harm behaviour compared with no suicidality were younger age and poor psychosocial functioning. In addition, the model included variables (depressive symptoms) which although statistically non-significant improved the predictive ability of the model (Hosmer–Lemeshow Goodness-of-Fit $\chi^2 = 8.327$, df = 8, $P = 0.411$, model classified correctly 81.5%) (Table 3). The significant predictors for having made a suicide attempt compared with no suicidality were depressive symptoms, poor psychosocial functioning and not having depressive disorder comorbid with anxiety disorder. Variables which were statistically non-significant but improved the predictive ability of the model were: depressive disorder with anxiety and other comorbidity, depressive disorder with other comorbidity, older age of onset for the first mood disorder, and older age (Hosmer–Lemeshow Goodness-of-Fit $\chi^2 = 17.00$, df = 8, $P = 0.024$, model classified correctly 87.2%) (Table 3).

Discussion

This large naturalistic study investigated whether suicidal ideation, deliberate self-harm behaviour and suicide attempts differed between depressed adolescent outpatients with and without comorbidity. Somewhat surprisingly, based on diagnostic classifi-

Table 3 Odds ratios of predictor variables for suicidality among adolescent outpatients with mood disorders

Characteristic	Predictor	OR	95% CI	*P*
No suicidality versus suicidal ideation	BDI-21	1.10	1.04–1.16	0.000
	GAF	0.94	0.90–0.99	0.010
No suicidality versus deliberate self-harm behaviour	Age	0.25	0.10–0.65	0.004
	GAF	0.93	0.88–0.98	0.009
	BDI-21	1.05	0.99–1.11	0.077
No suicidality versus suicide attempt	BDI-21	1.13	1.06–1.21	0.000
	GAF	0.89	0.83–0.95	0.000
	Onset of first mood disorder	1.19	0.98–1.44	0.075
	Age	0.38	0.12–1.23	0.106
	Mood disorder, anxiety	0.23	0.06–0.90	0.035
	Mood disorder, anxiety,other comorbidity	0.22	0.04–1.17	0.076
	Mood disorder, other comorbidity	1.21	0.30–5.00	0.791

Abbreviations: BDI-21 = Beck Depression Inventory, BAI = Beck Anxiety Inventory, GAF = Psychosocial functioning, OR = odds ratio

cation only, no statistically significant differences were found in different forms of suicidal behaviour between non-comorbid and comorbid depressive disorders. However, when self-reported depressive and anxiety symptoms and psychosocial functioning were taken into account in multivariate analyses, there was a trend that suicide attempts associated with comorbidity, which lends some support to the initial hypothesis of more severe suicidal behaviour in depressive disorders with comorbidity.

The relatively high prevalence (49%) of any suicidality in depressed adolescent outpatients in our study falls within the previously reported range of 42–58% [32, 40]. Estimates of the prevalence of suicidal ideation in depressed adolescent outpatients have varied from 25 to 66% [32, 40]. The lower prevalence (19%) of suicidal ideation in this report was due to its classification among the most serious suicidal behaviour. The prevalence of suicide attempts has varied from 20% to 24% in adolescent outpatients with major depression [32, 40], in the present sample it was slightly lower (16%). The prevalence of deliberate self-harm behaviour for this sample (13%) was also lower than that estimated in general clinical samples (21%) [9], and among adolescent inpatients (40%) [11]. These lower prevalences are probably due to our methodological decision to include only unambiguous suicidal ideation and behaviour, and to the relatively high threshold of the K-SADS-PL interview for suicidality [24].

Several previous studies emphasising the significance of psychiatric comorbidity in youthful suicidal behaviour have been based on community samples [13, 20, 34, 50]. In these studies depression, particularly when comorbid with disruptive behaviour, substance use and anxiety disorders, has been associated with high rates of suicide attempts. Furthermore, the risk of suicidal behaviour appears to rise for combinations of these disorders. Adolescent suicide attempters have reportedly had higher rates of psychiatric disorders than those with only suicidal ideation [6, 15]. However, in the clinical study by Wetzler et al. [49], depressed adolescent outpatients with suicidal ideation did not differ from those with suicide attempts according to psychiatric diagnoses, and in the clinical study by Goldston et al. [19], adolescent inpatients who had attempted suicide did not differ from non-suicidal inpatients in rates of comorbid mood and anxiety disorders. Probably the more severe degree of depression in the present sample and in other clinic-referred samples [49] has masked the impact of comorbid disorders on suicidal ideation and attempts. However, a general understanding to emerge from research so far is that depressive disorders, whether comorbid or not, are specifically associated with suicidal behaviour [12, 34, 47, 49].

Previous research gives a somewhat inconsistent picture of the impact of comorbid anxiety disorders on suicidal behaviour in youthful depressive mood disorders. Some studies based on community samples have found comorbid anxiety disorders to be risk factors for suicidal behaviour in depressive disorders [13, 50], while other studies, based on clinical samples have not [19, 49]. Our finding that symptoms of anxiety but not categorical diagnoses of anxiety disorders associated with suicide attempts in depressed adolescents is consistent with previous findings of significant associations of anxiety symptoms and suicidal behaviour in adolescent depression [12, 17, 30, 49]. This finding may indicate that the role of anxiety in youthful suicidality is not sufficiently detected if only a dichotomous measure of a diagnosis is used.

Depressed adolescents who had deliberately harmed themselves differed from those with suicidal ideation or suicide attempts. Depressed self-harmers were younger than subjects with other suicidal behaviours. The onset age of self-harm behaviour in other studies has commonly been approximately 13–

14 years [37], while suicidal ideation rates increase after 16 years [34], and the rates of suicide attempt after 14 years [34]. So our findings here accord with previous studies. Adolescents who had deliberate self-harm behaviour had less severe depressive symptoms than those with suicidal ideation or suicide attempt. In this case, previous research conducted with community samples is not comparable with our study. In community samples, adolescents who have self-harmed themselves report more depressive symptoms than those with no self-harm [36, 37, 42]. Moreover, unlike earlier reports that both depression and anxiety are linked with deliberate self-harm behaviour [26, 29], we found no such association. Again, these previous studies were based on community samples. The role of depression and anxiety in deliberate self-harm behaviour may be different in youthful community samples compared with clinical study samples when the subjects are severely depressed outpatients.

Methodological considerations

The study sample was large and based on consecutive referrals. The assessments were thorough and based on well-studied interview instruments and self-report scales. As this study focused on depressive disorders which adolescents themselves are known to report reliably [43], parents were not interviewed. Compared with many previous clinical studies on adolescent mood disorders and suicidal behaviour [19, 49], a wide spectrum of suicidal behaviours was assessed, including deliberate self-harm behaviour in addition to suicidal ideation and suicide attempts. In order to separate severe suicidal behaviour, only unambiguous suicidal behaviours fulfilling the "threshold" criteria in the K-SADS-PL were assessed.

The results from this clinical sample may not be directly generalised to populations other than adolescent outpatients. Although the sample was large, the low number of males and younger adolescents may have affected our ability to detect gender and age differences. Likewise the small sample size in different groups of psychiatric comorbidity limited the power to detect differences between groups, and the obtained results should be interpreted with this in mind. The life-time age of onset data were obtained retrospectively, which can be considered as a limitation.

Implications

It is primarily depressed disorders in adolescents, whether comorbid or not, which are associated with suicidal ideation and suicide attempts. The association of anxiety symptoms with suicide attempts in depressed adolescents emphasises the need for anxiety symptoms to be assessed as part of the evaluation of risk for suicidal behaviour in youth. Self-report instruments of anxiety may be useful supplements to the clinical interview. Younger adolescents with less severe depression who deliberately self-harm may be demonstrating suicidality. This finding is important to clinicians because early identification of depressed adolescents who deliberately self-harm could help to prevent escalation of suicidal behaviour. Further research on the correlates and consequences of self-harm behaviour among depressed adolescents is needed.

Acknowledgements We thank research assistant Mrs. Eevaliisa Orelma for her contribution in patient recruitment and data management and Hannele Heilä, M.D., Ph.D., Johanna Törrönen, M.D., and Kirsi Kettunen, M.D. for their contribution in the interviews. This study was financially supported by the Yrjö Jahnsson Foundation and Finnish Cultural Foundation.

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