Psychiatric Comorbidity in Adolescent Inpatients with Substance Use Disorders

CARLOS M. GRILO, PH.D., DANIEL F. BECKER, M.D., MARTHA L. WALKER, B.A., KENNETH N. LEVY, M.A., WILLIAM S. EDELL, PH.D., AND THOMAS H. MCGLASHAN, M.D.

ABSTRACT

Objective: To assess *DSM-III-R* Axis I and Axis II co-occurrence and comorbidity in adolescent inpatients with substance use disorders (SUD). **Method:** A consecutive series of 138 adolescent inpatients were reliably assessed with structured diagnostic interviews for Axis I disorders and Axis II personality disorders. To determine significant co-occurrence of diagnoses, comparisons were between 69 patients with SUD and 69 patients without SUD. **Results:** Disruptive behavior disorders were diagnosed significantly more frequently in patients with SUD than in those without SUD. Conduct disorder was diagnosed more frequently and oppositional defiant disorder was diagnosed less frequently in the SUD patients than in the non-SUD patients. Anxiety disorders were diagnosed less frequently in the SUD group. Cluster B personality disorders and borderline personality disorder were diagnosed more frequently in the SUD group. **Conclusions:** The findings replicate previous research showing high rates of co-occurrence of other psychiatric disorders in adolescent inpatients with SUD. The use of a relevant psychiatric comparison group allows for finer distinctions regarding significant comorbidity and the psychopathological implications thereof. *J. Am. Acad. Child Adolesc. Psychiatry,* 1995, 34, 8:1085–1091. **Key Words:** adolescence, comorbidity, diagnosis, substance abuse.

Substance use problems in adolescents represent a serious, prevalent, and costly public health problem (Bailey, 1992). Adolescence is a critical time for the development of psychiatric disorders (Myers et al., 1984; Regier et al., 1988), with the greatest risk for developing a substance use disorder (SUD) occurring at ages 15 to 19 years (Burke et al., 1990). Among community adolescent samples, the prevalence of *DSM-III-R* alcohol and drug use disorders has been estimated to be 32% (Reinherz et al., 1993). In adolescent populations at high risk for social impairment, such as those with psychiatric problems, the prevalence is even higher (DeMilio, 1989; Kutcher et al., 1989). Despite this, substance abuse remains a neglected area of research, particularly in severely disturbed populations (Bailey, 1992; Bukstein et al., 1989; Hovens et al., 1994; Kazdin, 1993).

Research with adolescents has documented that psychiatric problems-most notably mood disorders, conduct disorders, and anxiety disorders-frequently co-occur with substance use problems (Bukstein et al., 1989; DeMilio, 1989; Deykin et al., 1987; Fergusson et al., 1993; Hovens et al., 1994; Kaminer, 1991; Kashani et al., 1985; Milin et al., 1991; Stowell and Estroff, 1992). Few studies, however, have used structured diagnostic interviews and *DSM-III-R* criteria to examine comorbidity in inpatient adolescent populations (Bukstein et al., 1992; Hovens et al., 1994; Stowell and Estroff, 1992).

Previous studies have generally defined comorbidity as diagnostic overlap. To date, those conducting comorbidity research have paid relatively little attention to sampling and selection issues (du Fort et al., 1993). High base rates of both Axis I and Axis II diagnoses in severely disturbed inpatient samples make interpretation of diagnostic co-occurrence ambiguous (Allison, 1993). Sampling and selection biases can also be problematic (Berkson, 1946; du Fort et al., 1993). These issues highlight the need for cautious interpretation of

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From the Yale Psychiatric Institute and the Department of Psychiatry, Yale University School of Medicine, New Haven, CT. Dr. Becker is now with Menninger-SFBA, Burlingame, CA; Mr. Levy is now with City College, New York; and Dr. Edell is now with Horizon Mental Health Management, Denton, TX.

Reprint requests to Dr. Grilo, Yale Psychiatric Institute, P.O. Box 208038, New Haven, CT 06520–8038.

diagnostic co-occurrence and circumspect generalization of findings. Following the approach suggested by Allison (1993), we propose that, at a minimum, significant co-occurrence be defined as that greater than observed in a relevant comparison group. Comparison groups should be ascertained similarly and obtained from the same overall sample characterized by similar demographic and severity features.

In this study, we examined the frequency of co-occurrence of *DSM-III-R* Axis I and Axis II diagnoses in a consecutive series of hospitalized adolescents by administering structured diagnostic interviews. We aimed to answer the following questions: (1) What are the most frequently assigned additional Axis I and Axis II diagnoses? (2) Do certain Axis I and Axis II disorders occur significantly more frequently in patients with SUD than in patients without SUD?

METHOD

Subjects

Subjects were a consecutive series of 138 systematically evaluated adolescent inpatients admitted to the Yale Psychiatric Institute, a private, not-for-profit, tertiary-care teaching hospital. These patients were hospitalized for a variety of psychiatric problems which may or may not have included SUD. Thus, our systematic sampling is reflective of an adolescent psychiatric unit and is not characteristic of a substance abuse treatment facility. The majority of patients admitted had third-party insurance coverage; during the time of this study, public entitlement patients were not admitted. Patients were admitted on the basis of psychiatric need, and no other selection processes (e.g., pressure for certain types of patients or diagnoses) existed. Subjects provided informed consent at the time of admission.

All patients were given structured clinical interviews for *DSM-III-R* disorders as part of their diagnostic evaluation at the time of admission. Of the 138 subjects, 76 (55.1%) were male and 62 (44.9%) were female. Ages ranged between 12 and 18 years (mean = 15.5, SD = 1.4). One hundred fourteen (82.6%) of the subjects were Caucasian, 11 (8.0%) were African-American, 6 (4.3%) were Asian-American, and 7 (5.1%) were of other ethnicity. Subjects were predominately from middle-class families: 70% of the subjects were from social classes I, II, or III, based on the Two-Factor Index of Social Standing (mean = 2.7) (Hollingshead and Redlich, 1958).

Procedure

Subjects were given the Schedule for Affective Disorders and Schizophrenia for School-Age Children-Epidemiologic Version (Orvaschel and Puig-Antich, 1987) to determine current *DSM-III-R* Axis I diagnoses. Subjects were also given the Personality Disorder Examination (PDE) (Loranger, 1988) to assess the presence of *DSM-III-R* Axis II personality disorders. In adolescents, specific PDE criteria were considered present if they had been pervasive and had persisted for at least 3 years (Loranger, 1988). Antisocial personality disorder was not assessed because of the age criterion.

The structured diagnostic interviews were performed by master's- and doctoral-level interviewers trained to high levels of reliability. Interviewers were blind to the aims of this study. Axis I current diagnoses were reliably assigned, with κ coefficients (Cohen, 1960) for interrater reliability ranging from .65 to 1.0 (average κ = .77). Personality disorder diagnoses were also reliable, with κ coefficients ranging from .65 to 1.0 (average κ = .84).

Final research diagnoses were established by the "best estimate method," based on the structured interviews as well as on any additional relevant data from the medical record. Our approach was in accordance with the LEAD standard (Pilkonis et al., 1991; Spitzer, 1983).

Patients were also given a Global Assessment of Functioning rating, reflecting severity of symptomatic and functional impairment (American Psychiatric Association, 1987).

RESULTS

Frequency of Substance Use Disorders

Sixty-nine patients met criteria for at least one SUD, and 69 did not. The SUD sample is characterized by disorders of alcohol use in most cases, and of additional substances in many cases. In this report, we did not distinguish between different substances of abuse, nor did we make a distinction between substance abuse and substance dependence, due to inadequate subsample sizes to permit meaningful analyses.

Table 1 summarizes demographic and severity variables for the two groups. The patients with and without SUD did not differ with regard to age, sex, ethnicity, socioeconomic status, or Global Assessment of Functioning.

Axis I Comorbidity

Table 2 summarizes the distributions of the major categories of Axis I diagnoses and of the disruptive behavior disorder diagnoses in the two patient groups. Table 2 also shows the χ^2 analyses (or Fisher's Exact Tests when appropriate), performed to test for group differences, and φ coefficients. The φ is an effect-size measure for contingency table analyses (Cohen, 1977), reflecting the strength of associations.

As shown in Table 2, anxiety disorders and disruptive behavior disorders differed significantly in their distribution between the two groups. Disruptive behavior disorders were assigned more frequently in patients with SUD; anxiety disorders occurred more frequently in patients without SUD. Because of the low frequency of specific anxiety disorders, meaningful tests of their

TABLE 1
Demographic and Severity Characteristics of the Two Groups

	SUD Group (n = 69)	Non-SUD Group (n = 69)	F/χ^2	p
Age (yr)				
Mean	15.6	15.4	0.55	NS
SD	1.4	1.5		
Gender (No.)			1.05	NS
Male	41	35		
Female	28	34		
Ethnicity (No.)			1.94	NS
Caucasian	60	54		
African-American	4	7		
Asian-American	2	4		
Other	3	4		
Father's SES[a]			3.99	NS
I	16	10		
II	10	10		
III	16	13		
IV	18	9		
V	2	5		
Mother's SES[b]			2.85	NS
I	1	4		
II	16	14		
III	15	11		
IV	15	10		
V	14	11		
Current GAF				
Mean	38.2	37.9	0.05	NS
SD	6.4	8.5		

Note: SUD = substance use disorder; SES = socioeconomic status; GAF = Global Assessment of Functioning; NS = not significant.
[a] Father's SES for n = 62 and n = 47, respectively, for the SUD and non-SUD groups.
[b] Mother's SES for n = 61 and n = 50, respectively, for the SUD and non-SUD groups.

distributions in the two groups could not be performed. As shown in Table 2, however, two specific disorders within the disruptive behavior disorder category showed significantly different distributions between groups. Conduct disorder (CD) was diagnosed more frequently in patients with SUD. The significant φ coefficient indicates a moderate effect. In contrast, oppositional defiant disorder (ODD) was diagnosed significantly more frequently in the group without SUD. A χ^2 analysis indicated that CD and ODD were differentially associated with SUD (χ^2 = 10.49, $p < .001$).

Comorbidity of Axis II Disorders

Table 3 summarizes the distributions of Axis II disorders in the two groups. Significant co-occurrence was observed between SUD and cluster B personality disorders (characterized by "dramatic and erratic" behaviors) as well as between SUD and borderline personality disorder. The significant φ coefficient indicates a moderate effect.

DISCUSSION

This study represents an addition to the literature because of its nonselective ascertainment of a relatively large, consecutive series of adolescent inpatients, who were systematically assessed with structured diagnostic interviews performed reliably. An incremental contribution involves comparing the frequency of co-occurring Axis I and Axis II disorders among severely disturbed adolescent inpatients with SUD to a relevant psychiatric comparison group recruited from the same overall sample. The recruitment procedure should have eliminated potential selection and sampling confounds (du Fort et al., 1993) that make interpretation of previous studies uncertain. Moreover, the comparison group does not differ on potentially confounding demographic or severity variables. However, our findings may not be generalizable to outpatient or community populations in which base rates of disorders would perhaps be lower.

TABLE 2
Comparison of Groups with Respect to Co-Occurring Axis I Disorders

	SUD Group (n = 69) Frequency (%)	Non-SUD Group (n = 69) Frequency (%)	χ^2	φ
Psychotic disorders	4 (5.8)	5 (7.2)	0.12	.03
Mood disorders	45 (65.2)	50 (72.5)	0.84	.08
Anxiety disorders	10 (14.5)	20 (29.0)	4.26*	.18*
Disruptive behavior disorders	62 (89.9)	46 (66.7)	10.90***	.28***
Conduct disorder	52 (75.4)	24 (34.8)	22.96***	.41***
Oppositional defiant disorder	8 (11.6)	18 (26.1)	4.74*	.19*
ADHD	20 (29.0)	23 (33.3)	0.30	.05
Eating disorders	8 (11.6)	6 (8.7)	0.32	.05

Note: SUD = substance use disorder; ADHD = attention-deficit hyperactivity disorder.
* $p < .05$; ** $p < .01$; *** $p < .001$.

Our findings regarding the high rate of overlap with other *DSM-III-R* Axis I disorders among a heterogeneous group of adolescent inpatients with SUD are generally consistent with previous reports in noting high rates of mood disorders and disruptive behavior disorders (DeMilio, 1989; Gittelman et al., 1985; Kashani et al., 1985; Kutcher et al., 1989; Lewinsohn et al., 1991; Stowell and Estroff, 1992). In addition, the group comparisons allow for a finer distinction regarding comorbidity (Allison, 1993) and the psychopathological implications thereof.

Disruptive Behavior Disorders

Our finding that CD co-occurred with SUD significantly more frequently than in a relevant comparison group suggests comorbidity. This finding has been previously reported for less severely disturbed samples (Boyle et al., 1992; Caron and Rutter, 1991; Fergusson et al., 1993; Gittelman et al., 1985; Hinshaw, 1987; McGee et al., 1990; Milin et al., 1991; Stowell and Estroff, 1992). The degree of association between CD and SUD is moderate, particularly if one considers the base rates in our general psychiatric inpatient population. Although these two types of disorders are not equivalent, they may share certain psychopathological elements (Meyer, 1986).

Because our study was cross-sectional, the data cannot address important questions regarding the nature of the associations in terms of the course of the disorders. We note, however, that convergent findings from

TABLE 3
Comparison of Groups with Respect to Axis II Personality Disorders

	SUD Group (n = 69) Frequency (%)	Non-SUD Group (n = 69) Frequency (%)	χ^2	φ
Cluster A	10 (14.5)	6 (8.7)	1.13	.09
Paranoid PD	4 (5.8)	4 (5.8)	—	.00
Schizoid PD	1 (1.4)	0 (0.0)	—	.09
Schizotypal PD	6 (8.7)	2 (2.9)	—	.12
Cluster B	47 (68.1)	23 (33.3)	16.70***	.35***
Borderline PD	46 (66.7)	22 (31.9)	16.70***	.35***
Histrionic PD	5 (7.2)	4 (5.8)	0.12	.03
Narcissistic PD	5 (7.2)	1 (1.4)	2.79	.14
Cluster C	20 (29.0)	18 (26.1)	0.15	.03
Avoidant PD	4 (5.8)	6 (8.7)	0.43	.06
Dependent PD	3 (4.3)	4 (5.8)	0.15	.03
Passive-aggressive PD	14 (21.7)	12 (17.4)	0.41	.05
Obsessive-compulsive PD	2 (2.9)	2 (2.9)	—	.00
Personality disorder NOS	9 (13.0)	8 (11.6)	0.07	.02

Note: SUD = substance use disorder; PD = personality disorder; NOS = not otherwise specified.
*** $p < .001$.

several projects support the view that early CD is associated with increased risk for developing SUD in later adolescence. Robbins and Price (1991), on the basis of retrospective data from the National Institute of Mental Health Epidemiologic Catchment Area Project, reported that a greater number of CD symptoms in children predicted a greater rate of SUD in adolescence. Windle (1990), using data from the National Longitudinal Youth Survey, found that antisocial behaviors in early adolescence predicted substance use in late adolescence. Although less is known about the onset and course of psychopathology in severely disturbed adolescents, a number of studies with different assessment methods have found that CD tends to precede SUD (Boyle et al., 1992; Gittelman et al., 1985; Kandel et al., 1978).

Along this line, we found that CD was diagnosed significantly more frequently in patients with SUD but that ODD was diagnosed significantly more frequently in patients without SUD. Since the current age of CD patients (mean = 15.0 years) and ODD patients (mean = 15.7 years) did not differ significantly (F = 1.83, not significant) in our sample, these findings support the validity of the ODD-CD distinction (Lahey et al., 1992; Rey, 1993). But, in addition, they suggest that—while CD may precede SUD—ODD does not, in general, directly precede SUD. And that the progression from ODD to SUD, when it occurs, is mediated by CD.

Affective Disorders

Previous reports suggest that depression and SUD may be comorbid in adolescents (DeMilio, 1989; Fergusson et al., 1993; Greenbaum et al., 1991; Hovens et al., 1994; Kaminer, 1991). Although we found that SUD and depression co-occurred frequently (64.7%), this rate did not differ significantly from the high occurrence rate of depression in our psychiatric comparison group (72.9%). Our use of a relevant comparison group allows for a finer distinction of significant comorbidity by allowing us to take into account the high base rates for certain disorders. In contrast, our sample of non-SUD patients had a significantly higher frequency of anxiety disorders than did SUD patients.

These findings are in contrast with those previously reported for community (Fergusson et al., 1993) and inpatient (Hovens et al., 1994) samples. In a community sample, we might expect a different pattern of comorbidity; that is, when one psychiatric disorder is present it may increase the risk for another disorder also being present. In severely disturbed samples with high rates of disorders, however, "significant co-occurrence" depends on the nature of the comparison group (Allison, 1993). This is reflected in the different findings regarding the co-occurrence of mood and anxiety disorders with SUD observed in our study versus that of Hovens et al. (1994). Hovens and colleagues found that substance abusers had a higher incidence of mood disorders and one anxiety disorder (social phobia) than a comparison group. Hovens and colleagues (1994) ascertained a smaller comparison sample of hospitalized adolescents with disruptive behavior disorders, whereas our comparison group was ascertained in exactly the same manner as the SUD group. Although there exist many possible explanations, the lower rates of anxiety disorders in our SUD group could perhaps be attributed to a tendency for this group to manifest externalizing, rather than internalizing, behaviors.

Personality Disorders

Perhaps due in part to the uncertain status of the personality disorder diagnosis in adolescence, previous studies have not systematically assessed for the presence of Axis II personality disorders. In this respect our reliable use of the well-validated PDE represents a potential addition to the literature. Consistent with findings for adults (Dulit et al., 1990), we found that cluster B personality diagnoses and borderline personality disorder were assigned more frequently in the SUD group. Substance abuse is generally regarded as, in part, an impulse control disorder that is more likely to be found in individuals with poorly integrated egos, characteristic of the cluster B "dramatic, emotional, or erratic" disorders.

Summary

Our study, which focused on hospitalized adolescents, found a high rate of diagnostic co-occurrence in individuals with SUD. Our relatively large sample size and the use of a similarly ascertained comparison group—which did not differ on potentially confounding demographic or severity variables—allowed us to draw some conclusions about the psychopathological relationships between SUD and other disorders common in adolescence.

Research and Clinical Implications

Additional comorbidity research in adolescents with SUD is needed. Studies using larger samples that would permit comparison of substance abuse versus dependence and of different substances of abuse are needed—as are longitudinal studies, which would permit examination of the relationships between disorders over time. Such studies are important not only for the light they may shed on our understanding of psychopathology, but also for their treatment implications. In particular, comorbidity research may lead to the identification of meaningful subgroups of patients who require specific treatments or who might respond differentially to standard treatments.

Clinically, this work has implications for treatment planning and for treatment matching (Kofoed et al., 1986). The high rate of coexisting psychopathology in adolescents with SUD indicates the need for careful comprehensive diagnostic evaluations in order to inform treatment plans. Exploration of the temporal relations between existing problems might inform treatment. However, findings (Kofoed et al., 1986) suggest that unified, integrative treatments for coexisting problems may be superior to distinct concurrent treatments. Empirical studies of this nature are certainly needed.

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