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Psychopathology among Substance Abusing Juvenile Offenders

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Abstract. The prevalence of substance abuse and coexisting *DSM-III* psychiatric disorders was evaluated in 111 juvenile offenders. As expected, a high rate of conduct disorder (91%) was present in both substance abusing and nonsubstance abusing juvenile offenders. However, significantly higher rates of attention deficit disorder and aggressive subtype of conduct disorder were present in those offenders who abused drugs and alcohol (54%). Excluding all conduct and oppositional disorder diagnoses, 39% of substance abusers versus 14% of the nonsubstance abusers demonstrated comorbid psychiatric diagnoses. These findings suggest that careful psychiatric evaluation of juvenile substance abusers may be necessary to optimize treatment planning. *J. Am. Acad. Child Adolesc. Psychiatry*, 1991, 30, 4:569-574. **Key Words:** juvenile offenders, substance abuse, comorbidity.

Studies of adult substance abusers have noted a high prevalence of coexisting psychopathology in both treatment (Ross et al., 1988) and general population epidemiological studies (Helzer and Pryzbeck, 1988). Ross et al. (1988) evaluated 500 adult substance abuse patients seeking assistance at an addiction treatment facility using the *DSM-III* based Diagnostic Interview Schedule (DIS). It was found that, in this adult substance abuse population, the more severe the substance abuse, the greater the likelihood of a coexistent psychiatric disorder. Those patients who abused both alcohol and drugs were most psychiatrically impaired.

The most common coexisting psychiatric disorders found in adults have been affective disorders (Weissman, 1980); anxiety disorders (Weiss and Rosenberg, 1985), particularly phobias (Mullaney and Trippett, 1979; Ross et al., 1988) and panic disorder (Helzer and Pryzbeck, 1988); and antisocial personality disorder (Cadoret et al., 1985; Hesselbrock et al., 1985). These findings have highlighted the need for careful evaluation of comorbid psychiatric disorders in adult patients with substance abuse problems in order to provide a comprehensive treatment plan.

Clinically, coexisting psychopathology has also been found among adolescent substance abusers. However, systematic studies involving the diagnosis of coexisting psychiatric disorders among adolescent substance abusers are not common (Bukstein et al., 1989). Deykin et al. (1987) found that alcohol abuse and drug abuse were associated with major depressive disorder in a large sample of college students, ages 16 to 19, using the DIS. In the same sample, drug abuse was associated with other psychiatric diagnoses, whereas alcohol abuse had no such association. Kashani et al. (1985) found that 16% of adolescent substance abusers

attending a drop-in counseling center suffered from so-called double-depression (dysthymic disorder with superimposed major depression).

Many studies have demonstrated an association between substance abuse and conduct problems (Bukstein et al., 1989; Goodwin et al., 1975a; Stewart et al., 1980). Two views have been expressed with respect to the relationship between substance abuse and antisocial personality disorder or conduct disorder. Merikangas et al. (1985) found evidence that these disorders may share genetic vulnerability suggestive of a common underlying pathology. They also raised the possibility that environmental instability may contribute to conduct disorder, questioning whether it is a non-specific manifestation of psychopathology. On the other hand, several studies have supported the concept of substance abuse and antisocial personality being etiologically distinct, although strongly associated (Goodwin et al., 1974; Lewis et al., 1983). Shuckit (1982) reported that early conduct problems predict later substance use abuse. However, rates of conduct and oppositional disorder among substance abusers have not been reported. Robins and McEvoy's (1989) analysis of predictors of substance abuse in young adulthood from the Environmental Catchment Area data (Regier et al., 1984) showed that as the number of adolescent conduct problems increased, the age of first significant substance use dropped. The relationship between early conduct problems and substance abuse was found to apply only to those whose substance use began in adolescence. There was no relationship found between early conduct problems and substance abuse in those whose substance use began in adulthood.

The association between hyperactivity and substance abuse remains unclear. Most follow-up studies of hyperactive subjects from childhood into adolescence, when reviewed, did not demonstrate a significant difference in substance abuse between adolescents who had been hyperactive and those who had not (Weiss and Hechtman, 1986). Gittelman et al. (1985) reported that adolescents who remained hyperactive at follow-up and were conduct disordered were much more likely to have a substance abuse disorder than either hyperactives who remitted or sibling controls. Alterman and Tarter (1986) reviewed the literature on hyperactivity as a risk factor for alcoholism and concluded that conduct disorder rather than hyperactivity placed individuals at risk for

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alcoholism and that the association of hyperactivity and alcoholism was due to the relationship between hyperactivity and conduct disorder. In the current population of juvenile offenders, Halikas et al. (1990) previously showed that aggressivity, but not hyperactivity, significantly predicted substance abuse.

Very few studies have examined comorbidity of anxiety disorders and substance abuse in adolescents (Bukstein et al., 1989), although 41% of U.S. high school seniors select "to relax and relieve tension" as a reason for their drug use in a self-report questionnaire survey (Johnston and O'Malley, 1986). DeMilio (1989) found that the most prevalent psychiatric diagnoses among recently detoxified adolescent inpatient substance abusers referred for psychiatric assessment were conduct disorder (42%), major depression (35%), and a combination of attention deficit, hyperactivity, or impulsive disorder (21%). The rates of conduct disorder (analogous to adult antisocial personality disorder) and major depression were slightly higher than in similar adult populations, whereas phobic or avoidant disorders were lower. Educational delays and personality disturbances were common. The most frequent diagnostic cluster in DeMilio's sample was attention deficit disorder with hyperactivity and conduct disorder.

The most common patterns of substance preference among DeMilio's sample were (1) a step-wise progression from alcohol and/or cannabis to cocaine (44%), (2) alcohol abuse alone (26%), and (3) drug abuse alone (28%). DeMilio found a higher ratio of major depression compared with transient "organic" depression among adolescents who preferred cocaine than in the other subgroups in his study. Cocaine was the most preferred drug in 67% of those with a diagnosis of attention deficit disorder (ADD), hyperactivity, or impulsive disorder.

Although there are relatively few studies that focus on the relationship between juvenile delinquency and drug use, an association has been noted since the mid-1960s (Chein et al., 1964). In a 1976 review of the literature, Elliot and Ageton found that not only was association between juvenile delinquency and substance abuse present in every study they reviewed but that the statistical relationship held for both serious and nonserious delinquency. There was also a consensus that delinquency precedes illicit drug use (Elliot and Ageton, 1976) and that this relationship is not spurious (Krohn and Massey, 1979). This temporal sequence has been noted in retrospective studies of adult substance abusers (Goodwin et al., 1975b; Roff, 1972) and adolescent studies (Johnston et al., 1978).

This report will examine the prevalence and pattern of substance abuse disorders and coexisting psychiatric diagnoses in juvenile offenders suspected of substance abuse.

Method

Subjects

One hundred eleven juveniles referred from the Milwaukee County Juvenile Court for possible alcohol and drug related problems were systematically assessed. Juveniles were referred for evaluation if the court worker felt that

there might be psychiatric and/or substance use problems. Of the subjects interviewed, 66% were white, 28% were black, and 6% were Hispanic, Native American, or other. There were 86 boys (77%) and 25 girls (23%). The study subjects were aged 11 to 17 years ($\bar{X} = 15.5$ years, $SD = 1.5$). The juveniles who participated in the study had been held in "secure detention" for at least 24 hours. Most of these subjects were repeat offenders (57%) and had been apprehended for break in, theft, robbery, disorderly conduct, vandalism, or running away. Two-thirds of the subjects (68%) were still in school. Overall, only about 5 to 10% of juveniles who came in contact with that juvenile system were placed in detention for any period of time.

Interview and Diagnosis

The 111 subjects who participated in this study received a systematic structured psychiatric diagnostic instrument designed expressly for use with children and adolescents, the Diagnostic Interview For Children and Adolescents (DICA), developed at Washington University in St. Louis (Herjanic and Campbell, 1977). The DICA was expanded to explicitly ask virtually all of the *DSM-III* criteria for childhood and adolescent diagnoses and to fully explore descriptive alcohol and drug abuse behavioral symptomatology. Adverse consequences, life problems caused by substance use, and biomedical symptoms have all been previously verified in a comparable adolescent population (Halikas et al., 1984). In this large cohort of adolescent juvenile offenders, Halikas et al. (1984) found good reliability and validity in the behaviorally based, symptom driven diagnostic criteria of *DSM-III*.

The diagnoses of mania, obsessive-compulsive disorder, major depressive disorder, oppositional disorder, conduct disorder, aggressive conduct disorder, and ADD (with or without hyperactivity) were assessed in all 111 subjects. For this study, none of the above diagnoses were regarded as mutually exclusive, so that an adolescent could be diagnosed as both oppositional and conduct disordered. Also noted were separate component symptoms of ADD (attention, impulsivity, and hyperactivity). Information on anxiety disorders other than obsessive-compulsive disorder was not picked up on this instrument. Specific family history of alcoholism, substance abuse, or other psychopathology was not asked of the adolescent subject.

Results

For this analysis, mutually exclusive substance abuse categories were created as follows: (1) no history of *DSM-III* criteria symptoms for substance abuse ($N = 21$, 19%); (2) alcohol abuse only ($N = 10$, 9%); (3) drug abuse only ($N = 20$, 18%); and (4) drug plus alcohol abuse ($N = 60$, 54%). These categories were selected so that inferences about each subgroup could be specific. There was a total of 90 substance abusers (81%).

Psychiatric diagnoses for each of the substance abuse groups are shown in Table 1. Percentages listed are within group rather than percentages of the entire sample. The most common diagnoses were conduct disorder (91%), oppositional disorder (43%), and aggressive conduct disorder (33%)

TABLE 1. DSM-III Diagnoses by Substance Abuse Groups

DSM-III Diagnoses	No Substances (N = 21)		Alcohol Abuse Only (N = 10)		Drug Abuse Only (N = 20)		Drug Plus Alcohol Abuse (N = 60)		All Substance Abusers (N = 90)	
	N	%	N	%	N	%	N	%	N	%
Mania	1	5	1	10	0	0	0	0	1	1
Obsessive-compulsive disorder	0	0	1	10	1	5	9	15	11	12
Depression	1	5	3	30	3	15	10	17	16	18
Symptoms of psychosis	2	10	0	0	1	5	5	8	6	7
Conduct disorder	19	91	9	90	16	80	57	95	82	91
Aggressive conduct disorder	7	33	7	70	10	50	44	73***	61	68**
Oppositional disorder	9	43	8	80	11	55	33	55	52	58
Attention deficit disorder	0	0	2	2	1	5	20	30*	21	23*
Individual attention disorder components										
Attention	1	5	2	2	3	15	19	32*	24	27*
Impulsivity	5	24	3	30	5	25	24	40	32	36
Hyperactivity	4	19	1	10	6	5	16	27	23	26
Average number of diagnoses (excluding attention disorder components)	1.4		2.3		1.6		2.3		2.2	

*p = 0.05, **p = 0.01, *** p = 0.005.

in the nonabusers. The substance abusing groups also had high rates of conduct disorder (91%), aggressive conduct disorder (68%), and oppositional disorder (58%) as well as ADD (23%), and major depression (18%).

Abusers of both drugs and alcohol demonstrated significantly greater psychopathology than nonsubstance users for aggressive conduct and attention deficit disorders (Table 1). The drug plus alcohol abusers also demonstrated significantly more aggressive conduct disorder ($p < 0.01$) and ADD ($p < 0.01$) than all other subjects combined. The alcohol abuse-only group had high rates of major depressive (30%), aggressive conduct (70%), and oppositional disorders (80%), but because of small cell sizes only a trend is seen in these high rates.

Table 1 also shows the mean number of psychiatric diagnoses (excluding ADD components) per group. Alcohol abusers and drug plus alcohol abusers had the highest average number (2.3) of other psychiatric diagnoses, whereas drug-only abusers had an average of 1.6. Nonabusers had an average of 1.4 diagnoses.

To test the hypothesis that substance abusers were more likely to have multiple psychiatric diagnoses than nonabusers, a variable that counted the number of subjects with additional psychiatric diagnoses (mania, psychoses, MDD, obsessive-compulsive disorder, oppositional disorder, ADD, attention disorder components) was devised. Sixty percent of the substance abusers carried triple diagnoses of substance abuse, conduct disorder, and additional psychopathology, compared with 13.9% of the nonabusers. Given the pervasiveness of conduct disorder among these juvenile court detainees (91% in both substance and nonabusers), this diagnosis was excluded from the analysis. Comparable levels of psychopathology were then found: 73% of the substance abusers versus 76% of the nonabusers received at least one psychiatric diagnosis. The nature of this comorbidity was further examined by excluding the behaviorally based di-

agnoses of conduct and oppositional disorders as well as applying strict criteria to ADD. When these behavioral disorders were removed, substance abusers demonstrated a remaining 39% comorbidity with psychiatric diagnoses versus 14% for the nonsubstance abusers. Chi-square analysis resulted in a significance level of 0.0595, with the substance abusers having the greater than expected cell size of additional psychiatric diagnoses.

The expanded interview provided sufficient information to determine the number of users for each of the nine drug categories listed in Table 2. Cannabis was overwhelmingly the most used drug (abused by 78 of the 80 drug abusers), followed by stimulants ($N = 26$), sedatives ($N = 19$), and cocaine ($N = 14$). Frequencies of these drugs broken down by the narrower categories, drug-only and drug plus alcohol, are shown in Table 3. Percentages listed are within group. Drug-only subjects abused an average of 1.1 drugs, whereas

TABLE 2. Drugs Abused by DSM-III Substance Abusers

	Drug Abuse Only (N = 20)		Drug Plus Alcohol Abuse (N = 60)		Total Group (N = 80)	
	N	%	N	%	N	%
Cannabis	19	95	59	98	78	70
Hallucinogens	1	5	10	17	11	10
PCP	1	5	1	2	2	2
Cocaine	0	0	14	23	14	12
Stimulants	1	5	25	42	26	23
Depressants	0	0	19	32	19	17
Opiates	0	0	9	15	9	8
Inhalants	0	0	6	10	6	5
Over the counter	0	0	3	5	3	3
Average number drugs abused (excluding alcohol)	1.1		2.4		2.1	

TABLE 3. *DSM-III Diagnoses by Abusers of the Four Most Frequent Drugs of Abuse*

DSM-III Diagnoses	Marijuana (N = 58)		Cocaine (N = 14)		Stimulants (N = 26)		Sedatives (N = 19)	
	N	%	N	%	N	%	N	%
Mania	0	0	0	0	0	0	0	0
Obsessive-compulsive disorder	10	13	4	29*	5	19	6	32***
Depression	13	17	4	29	7	27	6	32
Symptoms of psychosis	6	8	2	14	3	12	3	16
Conduct disorder	71	91	14	100	25	96	18	95
Aggressive conduct disorder	54	69**	13	93*	19	73	15	79
Oppositional disorder	44	56	12	86*	15	58	13	68
Attention deficit disorder	19	25*	7	50**	8	31	10	53***
Individual attention disorder components								
Attention	22	28	7	50*	9	35	10	53***
Impulsivity	28	36	9	64*	12	46	12	63***
Hyperactivity	21	27	8	57**	9	35	10	53***

* $p = 0.05$, ** $p = 0.01$, *** $p = 0.005$.

drug plus alcohol subjects abused 2.4 of these drugs.

Frequencies of other psychiatric diagnoses by the abusers of the four most frequent drugs of abuse, cannabis, cocaine, sedatives, and stimulants, are found in Table 3. In this table, the subjects are not in mutually exclusive groups. Percentages listed are within group. In addition to high rates of conduct, oppositional, and attention deficit disorders in all four groups, this table shows high rates of depression in the cocaine (29%), stimulant (27%), and sedative (32%) abusers. High rates of obsessive-compulsive disorder in the cocaine abusers (29%) and sedative abusers (32%) are also seen. There is an especially high rate of aggressive conduct disorder (93%) and oppositional disorder (86%) among the cocaine abusers.

Table 3 also shows chi-square significances for the comparison between these substance abusing groups and non-substance abusers. Cannabis users had a significantly higher incidence of aggressive conduct disorder and of ADD. Cocaine and sedative users also had significantly higher rates of the above psychiatric diagnoses and also for obsessive compulsive disorder, oppositional disorder, and the attention disorder components.

Table 4 presents the age of onset of substance use and current age for the sample. The average age of nonabusers was 14.1 years versus 15.8 years for the substance abusers. The average age of onset of substance use ranged from a low of 11.2 years for the drug plus alcohol abusers to a high of 12.4 years for the nonabusers and alcohol-only abusers.

Discussion

In this studied population, 81% of the adolescents met the diagnosis of substance abuse. Of these, three-fourths showed evidence of other psychopathology in addition to conduct disorder. These adolescent substance abusers were found to have significantly more additional psychiatric diagnoses than the nonabuser group, after excluding the behaviorally based diagnoses of conduct and oppositional disorders. It is interesting to note that with stringent criteria

for assessment of other psychiatric diagnoses and elimination of the ubiquitous behaviorally based diagnoses in this sample, greater evidence of elevated psychopathology in substance abusers is found. These findings are even more striking given the absence of assessment for anxiety disorders.

The nonsubstance abusers had the lowest mean age. Does this mean that they will develop psychopathology as they age? To address that question, the data were analyzed in two additional ways. The average age of first drug or alcohol use was compared for all four groups. As can be seen from Table 4, nonabusers had the oldest mean age for onset of use of substances or had passed the mean age of onset without having used substances, thus indicating that they were different in ways other than just age. Also, the group was stratified by age, and comparisons were made across all four groups of the same age. Here, too, the nonabusers had the least psychopathology, although the small "ns" preclude statistical analysis.

These findings support the aggregation of substance abuse, conduct disorder, and attention deficit disorder with hyperactivity. The latter diagnoses are the most prevalent in the substance abuse group, using *DSM-III* criteria. Conduct disorder was present in 91% of the cases, which is to be expected given the nature of the sample group. Attention deficit disorder was present in 23% of the cases; ADD and conduct disorder in 19% of the cases. Other prevalent psychiatric diagnoses found in this substance abuse population were major depression (18%) and obsessive-compulsive disorder (12%).

The elevated comorbid prevalence of ADD, major depression, and compulsive disorder in the substance abuse group as compared with comorbid prevalence rates of ADD (0%), major depression (5%), and obsessive-compulsive disorder (0%) in the nonsubstance abuse group are a clear indication of a strong trend toward increased psychopathology in the substance abuse group, although not significantly different in this sample population. The comorbid prevalence rates for major depression and obsessive-compulsive disorder are

TABLE 4. Substance Abuse Groups: Average Age and Age of Onset of Substance Use

	N	%	Average Age	Average Age of Onset of Use
Nonsubstance abusers	21	19	14.1	12.4
Alcohol abusers only	10	9	15.8	12.4
Drug abusers only	20	18	16.1	11.8
Drug plus alcohol abusers	60	54	15.8	11.2
All substance abusers	90	81	15.8	11.4

in keeping with similar rates found in adult chemical dependent populations (Eisen and Rasmussen, 1989; Ross et al., 1988).

Adolescents who abuse both alcohol and drugs clearly demonstrated a different pattern of substance abuse and more psychopathology than the other subgroups. Although all of the adolescent substance abusers in this research cohort approximate Cloninger (1987) type II early onset substance abuser, these drug plus alcohol abusing adolescents may possibly represent a clinically distinct subtype, even more closely associated with an earlier onset of substance abuse, a still greater genetic predisposition, more psychopathology, more temperamental risk traits, and more antisocial behavior. All of these risk factors adversely influence treatment outcome.

A number of the psychiatric symptoms may have been secondary to the effects of substance abuse. It is also possible that the correlation between substance abuse and psychopathology may be present for various other reasons or combinations thereof, such as self-medication, genetic predisposition and/or relationship to psychosocial stress. The hypothesis that subjects with addictive disorders use self-medication to modify an aversive psychological state (Khantzian, 1985; Milin et al., 1990, unpublished manuscript) warrants further investigation in adolescents given DeMilio's findings of preferred cocaine use in attention deficit, hyperactivity, or impulse disorders and in an increased prevalence of major depression. The findings from this study also supports this suggestion in the significant use of cocaine and sedatives by adolescents with ADD or symptoms ADD, including attention deficit, hyperactivity, or impulse disturbance. This suggestion is reinforced by the increased prevalence of major depression found among the alcohol-only abusers, a finding that duplicates studies in adult alcoholics.

The extent and nature of pretreatment psychiatric problems has been found to be the best single predictor of treatment outcome in substance using adult population (McClellan et al., 1986; Rounsaville et al., 1987). Adolescent treatment outcome data on a multicenter basis collected through the Chemical Abuse/Addiction Treatment Outcome Registry (Harrison and Hoffman, 1989) indicate that attempted suicide or pretreatment depressive syndrome and a history of legal problems were associated with poorer outcome, as measured by a greater tendency to relapse. Therefore, the high proportion of additional psychiatric diagnoses demonstrated in this population makes it imperative that

adequate evaluation for coexisting psychiatric disorders occurs in adolescent substance abusers.

There are many limitations to this work. This study did not evaluate a random sample of juvenile offenders but rather a pre-selected high-risk group. Thus, generalizations from this group are not possible. However, as an example of the frequency of psychopathology that may be found in high-risk adolescent populations, it is noteworthy. Since the informants were the adolescents themselves, it was not possible to get a specific family history of substance use or psychopathology beyond what the youngsters may have observed, heard, or concluded. Because parents or other knowledgeable adults were not interviewed, it is impossible to judge what or whether family problems may have contributed to these diagnoses. Without this biological and psychosocial data, it is impossible to speculate as to why some juvenile offenders become substance abusers and others do not. Future studies should focus on different populations of adolescent substance abusers not selected from a high-risk, behaviorally disordered pool in order to further understand the relationship between substance abuse, conduct disorder, ADD, and aggression as well as other psychopathology. Longitudinal studies, including psychosocial measurements of adolescent substance abusers, would be instrumental in delineating clear subgroups. More specific and individualized treatment plans with improved treatment outcomes are the hoped for result of this new diagnostic precision.

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