

Suicidal Ideation and Attempts among Chemically Dependent Adolescents

ABSTRACT

Objectives. Suicidal ideation and attempts were examined in a population of chemically dependent adolescents, a group at high risk of self-destructive behavior.

Methods. The prevalence and correlates of suicidality and of major depressive disorder were assessed by the Diagnostic Interview Schedule and a structured family and social history interview with 300 addicts aged 15 through 19 years.

Results. Suicidal ideation was reported by 31% to 75% of the subjects and suicide attempts were reported by 28% to 61%, with females predominating. Thoughts of suicide combined with prolonged thoughts of death in general and a desire to be dead were highly associated with suicide attempts. Exposure to physical or sexual abuse was associated with a significantly increased risk of suicide attempts for males but not for females.

Conclusions. The probability of a suicide attempt increases when thoughts of suicide coincide with morbid ideation of extended duration, suggesting that risk assessment should be based on duration as well as presence of morbid thoughts. Substance abuse treatment requires an assessment of suicidal potential and counseling for those whose potential is high, with special attention to males exposed to abuse. (*Am J Public Health.* 1994;84:634-639)

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Introduction

The dramatic rise in suicide among adolescents over the past quarter-century has not been matched by similar changes in other age groups. During the period 1960 through 1988, when the rate of suicide for persons aged 15 through 24 more than doubled from 5.2 to 13.2 per 100 000, the rate of suicide among those aged 45 through 64 decreased from 20.7 to 14.6 per 100 000 and the rate among those aged 75 through 84 decreased from 27.9 to 25.9 per 100 000.¹ Furthermore, a population study by Murphy and Wetzel² indicated that in the past 40 years, each cohort entering adolescence had a higher rate of suicide than the preceding cohort and this difference increased as each cohort aged through adolescence. This disparity among age groups suggests that the factors responsible for the increase in adolescent suicide either preferentially affect the young or are absent at older ages. Among the influences thought to have particular relevance for suicidal behavior in adolescence are increased competition for diminished resources,³ exposure to child abuse,^{4,5} high incidence of family fragmentation,⁶⁻⁸ elevated occurrence of depressive illness in cohorts born after 1935,⁹ greater availability of handguns,¹⁰⁻¹⁴ and increased use of alcohol and other drugs.¹⁰⁻¹⁵

Substance use may be especially important in the development of suicidal and other self-destructive behaviors. Mind-altering substances tend to inhibit impulsivity and facilitate the expression of suicidal impulses that might otherwise have been contained. In addition, substance abuse can result in social isolation and increase the risk of depressive mood by distancing an adolescent from family or by diminishing his or her

opportunities because of school failure, lost jobs, or legal involvement. Lastly, chemical dependence may place the adolescent in close contact with drug dealers and users who have easy access to handguns. The combination of substance abuse and availability of handguns poses an especially high-risk situation.

A substance-abusing population is particularly informative for the study of adolescent suicidal behavior and ideations. Self-destructive ideation, behavior, and suggested risk factors are common among this population,¹⁵ making it a useful group for empirical inquiry. Furthermore, this is a population with identified service needs that would benefit from improved prediction and treatment methods. Lastly, focusing on subjects at the extreme end of the substance-abusing spectrum, results from this population could provide useful information for preventive strategies among adolescent substance abusers who have not yet reached the level of chemical dependence.

The purpose of this study was threefold: first, to ascertain the prevalence of various forms of morbid/suicidal ideation and of suicide attempts among a group of adolescents who meet DSM-III-R criteria for chemical dependence¹⁶; second, to examine the relationship of various types of morbid ideation to the occurrence of suicidal attempts; and third, to assess selected social and

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demographic characteristics, including a history of victimization, as possible predictors of suicide attempts.

Sample and Settings

The study sample consisted of 300 adolescents (224 males, 76 females) aged 15 through 19 who were receiving residential treatment for their dependence on alcohol or other drugs. This sample was assembled during the course of a larger study of the prevalence and correlates of psychiatric and physical comorbidity among chemically dependent adolescents. Subjects were enrolled in the study from seven of eight Massachusetts treatment sites that were closely affiliated with the Massachusetts Department of Public Health and that had residential treatment programs designed for adolescents. The eighth treatment center chose not to participate in the study. The cost of care for most of the adolescents at these facilities was covered by Medicaid or by state funds through the Department of Public Health. The eligible study sample thus included consecutively admitted adolescents receiving state support for residential treatment for chemical dependence.

The seven facilities provided treatment modeled after the Alcoholics Anonymous 12-step program, which emphasizes clearly defined rules and expectations in conjunction with graded levels of responsibility and freedom. The treatment focused on behavior modification rather than on psychiatric morbidity, and, as a matter of policy, the treatment sites refused admission to youths who had florid psychiatric symptoms. We enrolled willing subjects into the study between the 1st and 4th weeks of treatment. For adolescents who were younger than 18 years and who were not medically emancipated, we obtained signed consent from their parents as well. The institutional review boards of the Harvard School of Public Health and the Massachusetts Department of Public Health and the directors of all seven treatment sites approved the study protocol, the methods of obtaining informed consent, and the content of the consent statement. Eligible subjects who refused to participate (18%) were almost identical to enrolled subjects with respect to age, gender, and race, suggesting that the study sample is representative of eligible adolescents at the treatment sites.

TABLE 1—Sociodemographic Characteristics of Study Subjects

	Males (n = 224)	Females (n = 76)	χ^2 ^a	P
Mean age, y	16.8	16.2		
White, %	83	81	0.30	.58
Grade retention ≥ 2 y, %	32	20	4.24	.04
Socioeconomic status ^b				
Class I, %	4	9	4.45 (df = 4)	.35
Class II, %	37	44		
Class III, %	31	28		
Class IV, %	24	16		
Class V, %	4	4		
Family ever received welfare, %	59	69	2.50	.11
Met DSM-III-R criteria for chemical dependence				
Alcohol only, %	4	12	9.15 (df = 2)	.01
Drugs only, %	5	11		
Both alcohol and drugs, %	91	78		
Either parent treated for psychological or emotional problem, %	40	65	12.54	< .0001
Either parent treated for alcohol problem, %	68	75	0.30	.58
Either parent treated for drug problem, %	47	47	0.01	.94
Victimization				
Child abuse report filed, %	20	43	14.10	< .0001
Victim of physical abuse, %	41	55	4.07	< .04
Victim of sexual abuse, %	10	72	110.37	< .0001
Any of the above 3 items, %	41	77	31.74	< .0001
Removed from home by protective authorities, %	20	41	12.66	< .0001

^adf = 1 unless otherwise noted.

^bDetermined by the Hollingshead Index.²¹ Class I = most advantaged; Class V = least advantaged.

Methods

We obtained information on suicidal ideation and suicidal attempts by means of the Diagnostic Interview Schedule (DIS), Version III-R,¹⁷ a validated, structured interview that ascertains the prevalence of psychiatric disorders according to DSM-III-R criteria. Interviewers were college graduates who had previously worked with adolescents and who successfully completed two weeks of training in the administration and coding of the DIS. Training included background on the structure and purpose of the DIS, mock interviewing and coding, homework exercises, and finally actual interviews with the trainer present. Regular meetings were held throughout the study period to review interview techniques and to ensure that interviewers did not stray from the established protocol.

The section of the DIS that assesses major depressive disorder includes questions on the occurrence of three forms of

morbid or suicidal ideation, as well as on the occurrence of a suicide attempt. The questions were as follows: (1) "Has there ever been a period of 2 weeks or longer when you thought a lot about death, your own, someone else's, or death in general?" (2) "Has there ever been a period of 2 weeks or longer when you desired to be dead?" (3) "Have you ever thought of committing suicide?" (4) "Have you ever attempted suicide?" The first two questions differed from the last two in that they specified a duration, whereas the last two inquired about any occurrence. Each question elicited a yes or no answer. Data on sociodemographic characteristics and on victimization were obtained by a structured interview also administered at the time of the subject's enrollment into the study. Information on parents' substance abuse and psychological problems was obtained from the subjects and not by direct examination of the parents. Data on parents' psychological problems were elicited by the follow-

TABLE 2—Prevalence of Suicidal Thoughts and Suicide Attempts, by Gender

	Males (n = 224)		Females (n = 76)		Relative Risk ^a	95% Confidence Interval	P
	No.	%	No.	%			
Thoughts of death in general	105	46.8	53	69.7	1.8	1.2,2.5	.001
Desire to be dead	69	30.8	44	57.9	1.6	1.3,2.0	<.001
Thoughts of suicide	121	40.3	57	75.0	1.8	1.2,2.8	.001
Suicide attempt	63	28.1	46	60.5	1.8	1.4,2.4	<.001

^aRelative risk calculated with males as the reference group.

TABLE 3—Suicide Attempts by Number of Thoughts Experienced, by Gender

Number of Thoughts	Males (n = 224)				Females (n = 76)				χ^2 ^a	P
	No. Experiencing Ideation	Suicide Attempts		No. Experiencing Ideation	Suicide Attempts					
		No.	%		No.	%				
None	72	2	2.7	10	0	0.0		
One	65	15	23.0	16	6	37.5	2.36	.15		
Two	31	11	35.4	12	12	41.6	0.14	.72		
Three	56	35	62.5	38	35	92.1	10.44	<.001		

^adf = 1 (comparing males vs females).

ing questions: "Has your father (mother) ever had a psychological or emotional problem? Has he/she ever received treatment for this problem?" Only parents who were reported as having received treatment were classified as having a psychological difficulty. Similarly, parental alcohol and drug use was determined by the following question: "Has your father (mother) ever been treated for his/her use of alcohol (drugs)?" We assessed victimization by subjects' answers to four questions: (1) whether a report of child abuse or neglect had ever been filed with a child protective agency on behalf of the subject or any sibling; (2) whether the subject had ever experienced physical abuse; (3) whether the subject had ever been subjected to sexual abuse; and (4) whether the subject had ever been removed from the home by authorities of the child protective system. Each question elicited a yes or no answer.

Data were analyzed by SAS.¹⁸ Associations of suicide attempts with morbid ideation, gender, and history of victimization were assessed by point estimates and confidence intervals of relative risks. All analyses were done separately for

each gender and then for the total sample, controlling for gender with the Mantel-Haenszel summary relative risk statistic.¹⁹ P values were computed by the Cochran-Mantel-Haenszel statistic.²⁰

Results

Characteristics of Subjects

Table 1 shows the personal characteristics of the study subjects for each gender. Despite representation of all socioeconomic groups as determined by the Hollingshead Four-Factor Index,²¹ the sample was largely a disadvantaged one characterized by a high degree of welfare reciprocity, parental alcohol and drug abuse, parental emotional or psychological problems, and a high prevalence of victimization among the subjects. Males were significantly more likely than females to be at least two grades below their age-appropriate level and to meet DSM-III-R criteria for dependence on both alcohol and drugs. Females were more likely to report at least one parent with psychological or emotional problems and to have been

victimized through physical and sexual abuse.

Prevalence of Morbid Ideation and Suicide Attempts

Table 2 shows the reported prevalence of the three types of morbid ideation and of suicide attempts. Females were almost twice as likely as males to have experienced each type of ideation and were more than twice as likely to have made a suicide attempt. Table 3 shows the proportion of subjects who had made a suicide attempt among those reporting no, one, two, or three types of morbid ideation. For both genders, the proportion of subjects attempting suicide increased with the number of thoughts experienced. The increase was slightly but not significantly more marked among females. Only in the extreme group of those who had experienced three types of ideation were females significantly more likely to be suicide attempters. These data suggest that both gender and the number of types of ideation play a role in the development of a suicide attempt but that female gender has its greatest impact only when all three types of ideation are present.

Type of Morbid Ideation as a Predictor of a Suicide Attempt

The most sensitive predictor of a suicide attempt was having experienced a thought of suicide, which was present among 98% of the suicide attempters. However, since the thought of suicide was also reported by 38% of nonattempters, this type of ideation was not specific to attempters. For the entire sample, the risk of a suicide attempt among those who experienced a thought of suicide was only 59%. We therefore investigated whether the risk of a suicide attempt varied when a thought of suicide occurred with and without the other two types of morbid ideation. When a thought of suicide was experienced with neither of the other two types of ideation, the probability of an attempt was 44.4%. It remained at approximately this level when it occurred only with thoughts of death in general (40.0%) and when it was present with only a desire to be dead (42.9%). However, when a thought of suicide co-occurred with both of the other types of ideation, the risk of a suicide attempt was elevated to 74.5%. The data in Table 4 show that although a thought of suicide, either alone or in

combination with one other type of ideation, elevates the risk of suicide to between 16 and 18 times that of subjects without such a thought, the combination of all three types of ideation nearly doubles the elevated risk to 30-fold. These data indicate that although a thought of suicide is in itself an important risk factor for a suicide attempt, its impact is greatly magnified when it is joined by the other two types of ideation.

Since depressive illness is both a known cause of suicide and a concomitant of morbid thoughts, it was necessary to control for depressive illness to obtain an unconfounded measure of the association of morbid thoughts with suicide attempt. Lifetime prevalence of major depressive disorder was obtained by means of the DIS according to DSM-III-R criteria and was found to be positive in 78 of the 300 study subjects (28%). Table 5 shows that when major depressive disorder was controlled, the association of the three types of ideation with attempted suicide still held, indicating that these thoughts constituted an independent risk factor for attempted suicide apart from that imposed by depressive illness. In fact, the combination of the three types of ideation proved to be a better screen for a suicide attempt than the diagnosis of major depressive disorder. When the diagnosis of major depressive disorder was used as the screen for attempted suicide, its sensitivity was 46.7%, its specificity was 86%, and its predictive value was 65.4%. In comparison, the combination of the three types of ideation had values of 64.2%, 87.2%, and 74.5%, respectively, for the same screening parameters.

Suicidal Behavior and Victimization

Table 6 presents the association between attempted suicide and various aspects of victimization. The prevalence of all four indicators of victimization was very high in the total sample, ranging from a low of 25% for removal from the home to a high of 45% for physical abuse (see Table 1). All aspects of victimization were more common among females; the greatest gender difference was found for sexual abuse (72% of females vs 10% of males).

For females, exposure to victimization did not increase the risk of a suicide attempt. However, males who had been exposed to physical or sexual abuse or who stated that a report of abuse or neglect had been filed with authorities were between 1.8 and 2.4 times more

TABLE 4—Risk of Attempted Suicide, by Type of Morbid Ideation

	n	% Attempting Suicide	Relative Risk ^a	95% Confidence Interval	P
Thought of suicide only					
Yes	45	44.4	18.1	5.6, 57.9	<.001
No	122	2.5			
Thought of suicide plus thoughts of death in general					
Yes	25	40.0	16.2	4.8, 54.8	<.001
No	122	2.5			
Thought of suicide plus desire to be dead					
Yes	14	42.9	17.4	4.8, 62.1	<.001
No	122	2.5			
Thought of suicide plus both other ideations					
Yes	94	74.5	30.9	9.8, 93.1	<.001
No	122	2.5			

^aReference group is subjects who have not experienced thoughts of suicide.

TABLE 5—Suicide Attempts in Relation to Number of Morbid Thoughts, by Presence or Absence of DSM-III-R Major Depressive Disorder

	Number of Thoughts	No. Subjects	Suicide Attempters	
			No.	%
No major depressive disorder (n = 219)	0	78	2	2.6
	1	72	19	26.4
	2	30	11	36.7
	3	39	26	66.7
Major depressive disorder (n = 78)	0	1	0	0.0
	1	9	2	22.2
	2	13	5	38.5
	3	55	44	80.0

Note. Owing to lack of information, three subjects could not be evaluated for major depressive disorder.

likely than males without such exposures to have made a suicide attempt. In all instances, this elevation of risk for males was statistically significant. Finally, removal from the home by protective authorities was not associated with a suicide attempt in either gender or for the total sample. However, since removal from the home may occur for a variety of reasons, we reassessed its association with suicide attempt only among those 147 subjects who had experienced some form of victimization. Surprisingly, in this restricted sample, removal from the home was not significantly associated with attempted suicide. Those who had been removed from

home had only a 33% greater risk of having made a suicide attempt ($\chi^2 = 2.72$, $P = .10$).

Discussion

The prevalence of suicidal ideation and of suicide attempts in this population of substance-dependent youths is between five and seven times that found in other cross-sectional studies of community samples.²²⁻²⁴ Because of differences in methods of data collection, wording of questions, source of study subjects, and subjects' characteristics, comparisons among groups are difficult. However, a previous cross-sectional study

TABLE 6—Association of Victimization and Attempted Suicide

	n	% Attempting Suicide	Relative Risk	95% Confidence Interval	P
Report of abuse/neglect filed for subject or siblings					
Males					
Yes	44	45.5	1.8	1.2,2.7	.007
No	173	24.9			
Females					
Yes	30	63.3	0.9	0.5,1.6	.62
No	40	57.5			
Total					
Yes	74	52.7	1.4	1.1,1.9	.02
No	213	30.9			
History of physical abuse					
Males					
Yes	80	41.3	1.9	1.2,2.9	.003
No	115	21.7			
Females					
Yes	36	63.9	1.2	0.8,1.9	.32
No	29	51.7			
Total					
Yes	116	33.7	1.6	1.1,2.2	.003
No	144	46.8			
History of sexual abuse					
Males					
Yes	23	60.9	2.4	1.6,3.7	<.001
No	198	24.8			
Females					
Yes	54	61.1	0.9	0.6,1.5	.94
No	21	61.9			
Total					
Yes	77	61.0	1.5	1.1,2.1	.009
No	219	28.3			
Removal from home by authorities					
Males					
Yes	43	30.2	1.1	0.6,1.8	.77
No	171	28.1			
Females					
Yes	30	56.7	0.9	0.6,1.3	.60
No	43	62.8			
Total					
Yes	73	41.1	1.0	0.7,1.4	.92
No	214	35.1			

Note. Totals are adjusted for gender.

of 424 college freshmen aged 16 through 19 years that used the same data collection instrument reported a prevalence of attempted suicide of 3.5%, or $\frac{1}{10}$ the prevalence found in the present study.²³ In the college study, there were 40 students who met DSM-III criteria for substance abuse, including 4 (10%) who reported having made a suicide attempt. Among the 384 students who were not substance abusers, the suicide attempt rate was only 2.6%. The data

from that study as well as those from the present study provide evidence for an increased risk of suicidal behavior among youth with severe substance involvement.

The cross-sectional nature of this study does not provide data on whether morbid ideation preceded or followed a suicide attempt. The strong associations between these variables indicate that they are not independent of one another, but the associations do not inform

as to their relative occurrence. Conventional wisdom would suggest that morbid ideation is more likely to precede a suicide attempt rather than the other way around. However, the temporal sequence of these variables can be ascertained only through a longitudinal study of either a cohort or a case-referent design.

A clearer understanding of the interrelationship of suicidal thoughts with other types of morbid ideation has implications for both screening and clinical practice. Although a thought of suicide is strongly associated with a suicide attempt, the addition of thoughts of death, particularly a desire to be dead, potentiates the impact of a thought of suicide. This magnified risk may be due to the prolonged duration of the other two types of ideation. Self-destructive, morbid thoughts over an extended period of time provide clear indications for intervention activities. Because duration of ideation appears to enhance risk, we suggest that in the assessment of suicidal potential among substance-abusing adolescents one should elicit not just the presence of suicidal thoughts but their duration and tenacity.

A history of victimization significantly increased the risk of a suicide attempt only for males. The consistency of this finding across all indicators of victimization suggests that this may not be a chance result. Although it is possible that females can sustain victimization with less adverse emotional effects than males, we are not aware of any empirical findings suggesting such a trend. Rather, our finding could indicate that females were at very high risk for suicide attempts for reasons apart from victimization. In such a situation, victimization would not confer any observable added risk. Data supporting such an explanation are seen in Table 3, where for each level of suicidal ideation, the risk of attempted suicide is greater for females than for males. Furthermore, females were two and a half times more likely than males to have met criteria for major depressive disorder. Because of the excess of these risk factors among females it is possible that the deleterious impact of victimization is masked in this population of adolescent girls.

Lastly, the finding that removal from the home only slightly increases the probability of attempted suicide for maltreated subjects prompts three possible explanations. The first is that severity of victimization does not influ-

ence adverse emotional states associated with suicidal behavior. This explanation is not supported by the present data, and it is an unlikely explanation because studies have shown that children who have been severely abused have more deleterious outcomes than children who have experienced only mild abuse. A second explanation may be that removal from the home is not a good marker of severity of victimization. However, since the placement of a child outside the parental home is traumatic, is difficult to arrange, and involves the use of limited resources, protective authorities do not consider such action except in extreme cases of maltreatment. A third explanation for the slight increment in risk is that removal from the home is both a marker of severe victimization and, at the same time, potentially a restorative event. Children who have been removed from their homes may well have suffered more extreme abuse than those who were not removed, but they may also have had the advantage of a healing environment not available to children who experienced less severe victimization but who remained in their homes.

The results of this study indicate that youths who meet criteria for dependence on alcohol or drugs appear to be at exceptionally high risk of attempted suicide. Since a history of attempted suicide is known to be the most powerful predictor both of subsequent attempts and of completed suicide,^{25,26} special vigilance is justified for substance-dependent adolescents, especially if a suicidal thought occurs in individuals who also have other morbid thoughts of long duration. The finding that morbid thoughts of extended duration combined with a thought of suicide magnify the risk of attempted suicide has not previously been quantified. Although this finding may apply only to adolescents at the most extreme end of substance abuse, further research is warranted among both adolescents who are substance abusers but not chemically dependent and adolescents who are not sub-

stance users. Similar findings in diverse populations of adolescents may suggest opportunities for more accurate community-based screening and suicide prevention efforts. □

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