

1 of 1 DOCUMENT

Copyright © 1985 American Psychiatric Association;
American Journal of Psychiatry

Am J Psychiatry 1985; 142: 1299-1303

November, 1985

SECTION: REGULAR ARTICLES**LENGTH:** 3752 words**TITLE: A Pilot Study of the Effect of Exposure to Child Abuse or Neglect on Adolescent Suicidal Behavior****AUTHOR:** Eva Y. Deykin, Dr.P.H., Joel J. Alpert, M.D., and John J. McNamara, M.D.

ABSTRACT: The authors designed a pilot study to test if exposure to child abuse or neglect is associated with suicidal behavior in adolescence. Each of 159 adolescents who had attempted suicide was age- and sex-matched with two comparison subjects who had been treated for medical conditions unrelated to suicide attempts. The registry of the Massachusetts Department of Social Services was searched for the names of the subjects and comparison subjects. For both sexes prior contact with the Department of Social Services was three to six times more likely for probands than for the comparison subjects.

TEXT:

Of the three leading causes of death in adolescence -- accidents, suicide, and homicide -- suicide remains the most perplexing. Over the past 20 years, the rate of suicide among adolescents in the United States has risen 150%, from 5.1 per 100,000 in 1961 to 12.8 per 100,000 in 1980 [n1]. The increase in the rate of suicide among persons age 15 to 24 years is not likely to be due to better reporting or more accurate ascertainment of suicide, since the suicide rate of the middle-aged has remained stable and that of the elderly has declined slightly [n1].

Moderate but alarming increases in the rate of suicide have also been noted among younger adolescents and prepubescent children. The persistent and increasing risk of suicide for both adolescents and younger children has been documented by cohort analyses of Canadian and United States mortality statistics [n2-n4]. These findings suggest that the high rates of suicide in adolescence may be the result of two distinct kinds of factors: those responsible for the precipitous rise of suicide once adolescence has begun, and those associated with the increased suicide rates at the beginning of adolescence. The former are more likely to be due to variables occurring during adolescence, whereas the latter may reflect events rooted in childhood. Among the current but as yet untested hypotheses proposed to explain the increases in teenage suicide are the adolescent's difficulty in establishing psychological independence and separation from the family [n5,n6]; the availability of firearms, which are highly lethal and offer little opportunity for rescue [n7,n8]; societal factors, such as high divorce rates, that lead to family fragmentation [n9], lowered financial resources, and geographic mobility; and high unemployment rates among the young (10; Cormier et al., unpublished 1984 manuscript). However rational it may be to attribute causal influences to these variables, there have been no controlled studies assessing the association of adolescent suicide with these factors.

The identification of risk factors for suicide has been hampered by the lack of readily available populations and control subjects and by problems in obtaining unbiased, comparable information on all subjects. The current rise in the suicide rate among adolescents is clearly a major public health problem which requires investigation of possible predisposing factors that can be modified.

This study as designed to test the hypothesis that exposure to child abuse is associated with subsequent suicide attempts in adolescence. The possibility of an association between child abuse and adolescent suicidal behavior first occurred to us during a review of the hospital records of suicidal adolescents and of age- and sex-matched adolescents who had received emergency treatment for acute medical conditions. The review revealed frequent notations of child abuse, removal to foster care, and global family violence in the records of those who had attempted suicide. Rarely were such notations found in the hospital records of the comparison subjects. While this observation suggested that exposure to child abuse could be a risk factor for subsequent suicide attempts, the finding could also have been the result of differences in history taking. Adolescents with injuries incurred during a suicide attempt usually had been seen by psychiatrists who had elicited a detailed family history, whereas the comparison subjects had been seen by general physicians who rarely had explored family histories. Despite the likelihood that the observation derived from the hospital records was, in part, biased by the method of history taking, support for the underlying hypothesis emerges from relevant societal changes, psychodynamic and developmental theory, and clinical evidence.

A social change that has taken place concurrently with the rise in suicide rate among adolescents has been the increase in child abuse and neglect [n11]. Whether the increase in reports of abuse or neglect represents an actual rise or whether it simply mirrors a greater awareness and willingness to report these events is not established. Unquestionably, the passage of child abuse reporting laws that include penalties for those who are required but fail to report suspected cases has encouraged reporting. At the same time, however, it is unlikely that all of the increase in reported child abuse and neglect is due to more complete reporting. The prevalence of known risk factors for child abuse and neglect, such as young and single parenthood, diminished social supports, poverty, and unemployment, has also increased in the past decade [n12].

From a psychodynamic and developmental perspective, a link between child abuse or neglect and subsequent suicidal behavior may be possible for three reasons. First, violence as a means of coping with frustration and anger is a learned response. A victim of child abuse may thus be more likely to use self-aggression than would an individual who has not experienced child abuse.

Second, low self-esteem has been identified as a characteristic of both abused children [n13] and suicidal individuals [n14]. The low self-esteem observed among abused children is believed to spring from the child's incorporation of caretakers' judgments. The etiology of low self-esteem among persons who have either attempted or completed suicide is likely to be more complicated and multifaceted. However, if low self-esteem is a necessary component of suicidal ideation, persons with low self-esteem, for whatever reason, may be at higher risk for suicidal behavior.

Third, on the basis of developmental theory, an indirect association between child abuse or neglect and suicidal behavior may exist if abusive events necessitated the removal of the child from the home. Depending on the duration of placement and the age of the child, disruptions of bonding leading to a sense of separateness and a diminished ability to establish meaningful relationships could result. Emotional and social disconnectedness have also been noted among suicidal individuals and are believed to be important predictors of suicidal motivation.

From a clinical perspective, at least two studies have provided support for the hypothesis linking child abuse to suicidal behavior. Rosenthal and Rosenthal [n15] reported that in a clinical sample of 16 behaviorally disturbed very young children, subjects who had made a suicide attempt were significantly more likely than were nonsuicidal patients to have suffered abuse and neglect. Husain and Chapel [n16] reported that 61 of 437 adolescent girls admitted to a psychiatric hospital had experienced incest. Of the 61, 11 (18%) also had a history of suicidal behavior (Husain, personal communication). The findings of these two studies suggest the possibility that child abuse increases the risk of intentional self-inflicted injuries.

METHOD

During the course of an intervention study designed to reduce the occurrence of suicidal behavior among

13-17-year-old youths, 159 adolescents who required emergency treatment for a suicide attempt were identified from the emergency room logs of Boston City Hospital and the Brockton Hospital during a 3-year period from October 1979 to October 1982. These subjects constituted all of the suicide attempters seen in the emergency rooms during the study period and represented 0.4% of all emergency room admissions involving 13-17-year-old youths.

For this study, a suicide attempt was defined as any intentional, self-inflicted injury accompanied by a statement of suicidal intent. In addition, classic suicidal injuries such as a very large ingestion of a toxic substance, a gunshot wound to the head or abdomen, and a deep wound to the wrist or throat, were classified as suicide attempts even in the absence of stated intent. For each suicidal proband, two age- and sex-matched comparison subjects were identified from among the same week's emergency room admissions. Comparison subjects had been treated for acute medical conditions unrelated to suicidal behavior. Viral illness, gastrointestinal infections, and asthma were the most frequent medical problems in the comparison group.

Of the 159 subjects, 123 were girls and 36 were boys. The preponderance of female subjects held for each of the three years in the study and for each year of age (13-17 years); it was especially pronounced among subjects aged 13-14 years and somewhat muted in subjects 15-17 years of age.

The most commonly used method of attempting suicide was an overdose of pills, occasionally mixed with alcohol (89%). Over-the-counter drugs or medications prescribed for other family members frequently were used. Cutting of the wrists or throat was used by 8% of the subjects. Three subjects had jumped from a high place, one had attempted self-electrocution, and one had tried to hang himself. Two probands, the one who had tried hanging himself and one who had tried to overdose, did not survive; both were admitted to the hospital and died a few days later. To date, there have been no other deaths in the group of probands.

An unbiased test of our hypothesis required a data source that was independent of the hospital and that contained information gathered before the suicidal act or medical event which identified the adolescent as a study subject. The Massachusetts Department of Social Services, the only agency in the state empowered to receive, investigate, and deal with reports of child abuse and neglect, possessed the needed data. The department holds the only complete registry of child abuse and neglect reports and maintains a record of all children who have had contact with the department for any reason since 1930. For each subject, we obtained from hospital records the subject's name and date of birth, his or her parents' names, and all known home addresses. A separate sheet of data was prepared for each proband and matched comparison subject. Each matched triplet set (one proband and two comparison subjects) shared the last three numbers of a six-digit identification number. A Department of Social Services student intern who was unaware of the status of the subjects searched the department's central card registry to determine whether each subject had been known to the department before the date of the hospital visit that led to involvement in the study.

The methodology for this study was reviewed and approved by the institutional review boards of the Department of Social Services, Boston City Hospital, Brockton Hospital, and the Harvard School of Public Health.

Because of legal restrictions prohibiting access to any information that could be used to link an individual child to abuse or neglect data, the Department of Social Services was willing to provide only aggregate, group data. To meet these legal restrictions, the student intern placed the three sheets of paper for each matched triplet set side by side, aligned so that the last three digits of the identification number linking the members of each triplet set were horizontally adjacent. The presence or absence of contact with the department was indicated for each member of the triplet set by a "1" or "0," respectively. Thus, for each triplet set, one of eight possible combinations was recorded: 100, 110, 101, 111, 010, 011, 001, 000. Since the sheets were arranged in such a manner that the name of the proband was listed on the first sheet, followed by the two sheets listing the names of the matched subjects, a "1" in the hundreds column indicated prior contact for the proband, whereas a "1" in either of the other two columns designated contact for a comparison subject. Each of the eight possible combinations was summed over all triplet sets and was then subjected to a matched analysis as described by Mantel and Haenszel [17]. We calculated the odds ratio as the measure of association between contact with the department and subsequent suicide attempts. Next, the 95% confidence interval around the

odds ratio was computed to estimate the highest and lowest odds ratio likely to result in 95 out of 100 similar studies. To test whether the association we found in our data was statistically significant, we calculated p values by means of the chi-square statistic. Finally, to assess whether the matched design had increased statistical power, we computed the correlation of exposure within triplet sets. The correlation of exposure was close to zero, indicating that in future analyses, the match could be dissolved without loss of statistical power. Confirmation of this result was evident when a conventional unmatched analysis produced results identical to those of the matched analysis.

Finally, using the method described by Miettinen [n18], we calculated the estimated proportion of suicide attempts that could be attributed to the reasons requiring involvement by the department. The computation of this estimate takes into account both the magnitude of the observed association and the percentage of probands known to the department. This measure is conceptually analogous to the percentage of variance explained in a regression analysis and provides the best estimate of the percentage of suicide attempts that would be prevented if the exposure under study (in this case, contact with the department) could be eliminated.

RESULTS

Table 1 shows the frequencies of the eight combinations possible for each matched triplet set. A comparison of the suicide attempters and the comparison subjects showed that the former were three to six times more likely to have had contact with the Massachusetts Department of Social Services. Table 2 shows that for the entire sample, as well as for each sex, the suicide attempters had a significantly higher relative risk of having had previous contact with the department. Particularly noteworthy is the especially high odds ratio for male suicidal subjects, indicating a stronger association between contact with the department and subsequent suicide in male probands.

TABLE 1. Previous Contact With the Massachusetts Department of Social Services Among 159 Sets of One Adolescent Who Had Attempted Suicide and Two Matched Adolescents n1

Contact Classification	Combination Codes n2	Number of Triplet Sets
No subject with previous contact	000	123
Proband with previous contact; no comparison subject with contact	100	22
Proband and one comparison subject with previous contact	101, 110	3
Proband with no previous contact; one comparison subject with contact	001, 010	11
Proband with no previous contact; both comparison subjects with contact	011	0
All three subjects with previous contact	111	0

n1 The two comparison subjects had been treated for medical conditions unrelated to suicide attempts.

n2 A history of contact with the department is coded as "1"; no history of contact is coded as "0." The hundreds place in the code is reserved for the proband; the remaining two places are for the comparison subjects.

TABLE 2. Relationship Between Suicide Attempts in Adolescence and Prior Contact With the Massachusetts Department of Social Services

Group n1	Prior Contact				Odds Ratio	95% Confidence Interval	P
	Yes		No				
	N	%	N	%			
Girls					3.8	1.8-8.1	<.001
Probands (N=123)	19	15.4	104	84.6			
Comparison subjects (N=246)	12	4.9	234	95.1			
Total (N=369)	31	8.4	338	91.6			
Boys					6.0	1.5-23.4	<.02
Probands (N=36)	6	16.6	30	83.4			
Comparison subjects (N=72)	2	2.7	70	97.3			
Total (N=108)	8	7.4	100	92.6			
Total sample					4.2	2.2-8.1	<.001
Probands (N=159)	25	15.7	134	84.3			
Comparison subjects (N=318)	14	4.4	304	95.6			
Total (N=477)	39	8.1	438	91.9			

n1 Probands had attempted suicide; comparison subjects had been treated for other medical conditions.

Subjecting these data to the formula devised by Miettinen [n18], we found that the estimated proportion of suicide attempts that could be explained by events requiring involvement by the department was 12% for both sexes combined, 10% for female subjects, and 13% for male subjects.

DISCUSSION

The higher frequency of contact with the Department of Social Services among the suicidal probands is, at the very least, a marker for a greater burden of disadvantage experienced by these youths. Other investigators have reported that the background of suicidal youths is characterized by a high level of family disruption, loss [n19,n20], residential moves, and poverty [n21,n22]. However, since these studies have not included nonsuicidal comparison samples, assessment of the relative contribution of these and other adverse influences on the development of suicidal behavior

cannot be ascertained. Furthermore, these studies have all focused on subjects' histories obtained after the suicide attempt and elicited by persons who were aware of the subjects' suicidal behavior. It is likely that the direction of questions and extent of probing were partly dictated by knowledge of the subject's status.

The department's registry does not indicate the reason the child had had contact with the department. Nevertheless, the increased likelihood of department contact for the probands, coupled with the specific notations of child abuse or neglect found in their hospital records, provide empirical support for our hypothesis.

The department's data, which were recorded before the subjects' emergency room visits and were separate from the medical records, provided the only known, unbiased source of information. Hospital records could not have been used in this investigation, since they were inherently biased by the differential histories elicited from proband and comparison subjects. Detailed family and social histories were almost always obtained from the suicidal adolescents but rarely, if ever, from youngsters in the comparison group. Thus, if hospital records had been used as the source of information about child abuse or neglect, the resulting association would have been magnified and invalid.

To determine whether our subjects' contact with the department was due to child abuse or neglect we will have to review the individual case files of subjects whose names were found in the department's central card registry. If we find that these subjects had suffered abuse or neglect as children, it will be necessary for us to stratify them according to the type of abuse and the method of intervention employed by the department to redress the abuse. By calculating the risk for and the proportion of suicide attempts attributable to each stratum, it will be possible to ascertain whether type of abuse or type of service provided is most closely associated with suicide attempts in adolescence. We are now working on a methodology for reviewing the case files without infringing on the subjects' right to confidentiality.

Over the past few years, the department has shifted its work effort and resources from general social services to child protective services to meet the needs of the increased numbers of abused children. Beginning in the mid-1970s, virtually all the department's new cases involved abuse or neglect. Cases opened in the more distant past are more likely to have varied reasons for department involvement. However, contacts for reasons other than abuse or neglect should be proportionally distributed among the two groups of subjects and should not substantially alter the association.

It is also unlikely that the association we observed is due to confounding factors. Age and sex, known to be risk factors for suicide attempts, were controlled for by our selecting comparison subjects of the same age and sex as the probands. Seasonality, a variable associated with suicide, was controlled for by our selecting comparison subjects treated in the emergency room during the same week as the probands. Social class, a risk factor for child abuse, was made comparable by our selecting proband and comparison subjects from the same emergency room. Furthermore, as a measure of social class, we compared the proportion of probands and comparison subjects whose emergency room treatment was paid for by Medicaid, private insurance, or family. There was no significant difference between the proband and comparison groups within each hospital, although a larger proportion of subjects at Boston City Hospital (49%) than at Brockton Hospital (29%) were Medicaid recipients.

Lastly, if child abuse or neglect is associated with self-destructive activity, one might expect to find a higher prevalence of contact with the Department of Social Services among children who engage in less extreme forms of self-harm, as well as among children who have actually committed suicide. For example, youngsters who make suicidal gestures, who engage in flagrant risk-taking behavior, or who have repeated thoughts of suicide all might have high levels of prior contact with the department. If a gradient of risk can be shown for these various groups of subjects, such a finding would provide additional evidence for the hypothesis presented in this report. Assessment of a potential gradient of risk will be possible, since, in addition to the 159 suicide attempters discussed in this report, separate rosters of adolescents exhibiting less extreme forms of self-destructive behavior and of age- and sex-matched comparison subjects have been assembled. Future investigations of these subjects will be simplified by the knowledge that a matched analysis is not necessary. This will allow for the collection of data without the cumbersome system used in this pilot study and will permit the investigation of forms of child abuse or neglect, at which age the abuse or neglect occurred, and remedies instituted as possible predictors of suicidal and life-threatening behavior in adolescence. The

present investigation has revealed that prior contact with the Massachusetts Department of Social Services was a marker for adolescent suicidal behavior, but additional study will provide information on specific factors relevant to department involvement that are believed to be proximal risk variables.

SUPPLEMENTARY INFORMATION: Supported by grant 81-0776-81 from the William T. Grant Foundation. Received Jan. 2, 1985; revised April 26, 1985; accepted June 19, 1985. From the Department of Maternal and Child Health, Harvard School of Public Health; and the Departments of Pediatrics at Boston University School of Medicine and at Brockton Hospital, Brockton, Mass. Address reprint requests to Dr. Deykin, Department of Maternal and Child Health, Harvard School of Public Health, 677 Huntington Ave., Boston, MA 02115.

REFERENCES:

- [n1.] National Center for Health Statistics: Vital Statistics of the United States, vol II -- Mortality, 1960-1980. Washington, DC, US Government Printing Office, 1980
- [n2.] Hellon C, Solomon M: Suicide and age in Alberta, Canada, 1951-1977. *Arch Gen Psychiatry* 37:505-510, 1980
- [n3.] Murphy GE, Wetzel RD: Suicide risk by birth cohort in the US, 1949-1974. *Arch Gen Psychiatry* 37:519-523, 1980
- [n4.] Cosand BJ, Bourque LB, Kraus JF: Suicide among adolescents in Sacramento County, California, 1950-1979. *Adolescence* 17:917-929, 1982
- [n5.] Konopka G: Adolescent suicide. *Except Child* 49:390-394, 1983
- [n6.] Nardini-Maillard D, Ladame FG: The results of a follow-up study of suicidal adolescents. *J Adolesc* 3:253-260, 1980
- [n7.] Boyd J: The increasing rate of suicide by firearms. *N Engl J Med* 308:872-874, 1983
- [n8.] Markush RE, Bartolucci AA: Firearms and suicide in the US. *Am J Pub Health* 74:123-127, 1984
- [n9.] McArnarney ER: Adolescent and young adult suicide in the US -- a reflection of societal unrest? *Adolescence* 14:765-773, 1979
- [n10.] Boor M: Relationship between unemployment rates and suicide rates in eight countries, 1962-1976. *Psychol Rep* 47:1095-1101, 1980
- [n11.] American Humane Association: National Analysis of Official Child Neglect and Abuse Reporting: DHHS Publication (SRS)81-30232. Washington, DC, Children's Bureau, US Department of Health and Human Services, 1972
- [n12.] Select Committee on Children, Youth and Families, 98th Congress, first Session: US Children and Their Families, Current Conditions and Recent Trends: A Report of the House of Representatives. Washington, DC, US Government Printing Office, 1983
- [n13.] Martin HP (ed): *The Abused Child: A Multidisciplinary Approach to Developmental Issues and Treatment*. Cambridge, Mass, Ballinger, 1976

[n14.] Shneidman ES: Suicide, in Comprehensive Textbook of Psychiatry, 2nd ed, vol 2. Edited by Freedman AM, Kaplan HI, Sadock BJ. Baltimore, Williams & Wilkins, 1975

[n15.] Rosenthal PA, Rosenthal S: Suicidal behavior by preschool children. Am J Psychiatry 141:520-524, 1984

[n16.] Husain A, Chapel JL: History of incest in girls admitted to a psychiatric hospital. Am J Psychiatry 140:591-593, 1983

[n17.] Mantel N, Haenszel W: Statistical aspects of the analysis of data from retrospective studies of disease. J National Cancer Institute 22:719-748, 1959

[n18.] Miettinen OS: Proportion of disease caused or prevented by a given exposure, trait, or intervention. Am J Epidemiol 99:325-332, 1974

[n19.] Dorpat TL: Broken homes and attempted and completed suicide. Arch Gen Psychiatry 12:213-216, 1965

[n20.] Faigel HC: Suicide among young persons. Clin Pediatr (Phila) 5:187-190, 1966

[n21.] Teicher JD, Jacobs J: Adolescents who attempt suicide: preliminary findings. Am J Psychiatry 122:1248-1257, 1966

[n22.] Winn D, Halla R: Observations of children who threaten to kill themselves. Can Psychiatr Assoc J (Suppl) 11:283-294, 1966