

A Prospective Investigation of Major Depressive Disorder and Comorbidity in Abused and Neglected Children Grown Up

Cathy Spatz Widom, PhD; Kimberly DuMont, PhD; Sally J. Czaja, PhD

Context: Few prospective longitudinal studies have examined the relationship between abuse or neglect in childhood and depression in adulthood.

Objective: To determine whether abused and neglected children were at elevated risk of major depressive disorder (MDD) and psychiatric comorbidity, compared with matched control subjects, when followed up into young adulthood.

Design: Prospective cohort design study.

Setting: Midwestern metropolitan county area.

Participants: Children with substantiated cases of physical and sexual abuse and neglect (before the age of 11 years) from January 1, 1967, to December 31, 1971 (n=676) were matched based on age, race, sex, and approximate family social class with a group of nonabused and nonneglected children (n=520) and followed up into young adulthood (mean age, 28.7 years).

Main Outcomes Measures: Between October 20, 1989, and December 22, 1995, 2-hour in-person interviews were conducted, using the National Institute of Mental Health

Diagnostic Interview Schedule, Version III Revised, to determine DSM-III-R MDD and other psychiatric diagnoses.

Results: Child abuse and neglect were associated with an increased risk for current MDD (odds ratio [OR], 1.51; 95% confidence interval [CI], 1.06-2.14; $P \leq .05$) in young adulthood. Children who were physically abused (OR, 1.59; 95% CI, 1.00-2.52; $P \leq .05$) or experienced multiple types of abuse (OR, 1.75; 95% CI, 1.01-3.02; $P \leq .05$) were at increased risk of lifetime MDD, whereas neglect increased risk for current MDD (OR, 1.59; 95% CI, 1.10-2.29; $P < .01$). Childhood sexual abuse was not associated with elevated risk of MDD. Kaplan-Meier age-of-onset curves (log-rank statistic, 4.03; $df = 1$; $P = .04$) showed earlier onset of MDD for abused and neglected children compared with controls. Among those with MDD, comorbidity was higher for abused and neglected individuals than for controls.

Conclusion: These results support the need for clinicians to increase efforts to detect and treat depression in physically abused and neglected children.

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Author Affiliations: Department of Psychiatry, New Jersey Medical School, University of Medicine & Dentistry of New Jersey, Newark (Drs Widom and Czaja); and Bureau of Evaluation and Research, Office of Children and Family Services, Rensselaer, NY (Dr DuMont).

IN 2002, 2.6 MILLION REFERRALS were made in the United States for possible child maltreatment and approximately 896 000 cases were substantiated after investigation.¹ Child abuse has been linked to depression in clinical populations^{2,3} and community surveys.^{4,6} Most notably, childhood sexual abuse has been related to depression, with the predominance of studies focusing on women.^{7,8} Fewer studies have included men and women^{4,9,10} or victims of childhood physical abuse^{11,12} or neglect.^{7,13} Most studies have used cross-sectional designs and depended on retrospective self-reports of child abuse, causing some ambiguity because of forgotten or nondisclosed abuse or recollections of abuse that function to provide meaning for

current distress.¹⁴⁻¹⁶ One longitudinal study¹⁷ combined retrospective self-reports and official reports of physical and sexual abuse and neglect to assess risk of becoming depressed or suicidal during adolescence and young adulthood. Because of the heavy reliance on retrospective self-reports in the context of cross-sectional designs, there is little possibility of examining causal relationships.

To our knowledge, this article describes the first prospective assessment of risk for depression in a large group of male and female children with documented cases of childhood physical and sexual abuse and neglect and a matched comparison group followed up into adulthood. Earlier articles¹⁸⁻²⁰ from this project have described other mental health and be-

havioral outcomes. This prospective longitudinal study offers an opportunity to determine whether childhood maltreatment is a risk factor for depression. We have several goals: (1) to compare the risk of *DSM-III-R* major depressive disorder (MDD) in abused and neglected individuals and matched control subjects followed up into young adulthood, (2) to examine differences in risk of MDD by type of childhood abuse and/or neglect, and (3) to compare the age at onset of depression in abused and neglected children and matched controls. Finally, given the literature^{4,21} on the comorbidity of depression with other psychiatric disorders and the importance of the timing of depression relative to other psychiatric disorders, we also examine the extent of comorbidity of MDD and other psychiatric disorders in adults with documented histories of childhood physical and sexual abuse and neglect compared with controls and determine whether MDD occurs before, at the same time, or after the onset of other psychiatric disorders.

METHODS

SAMPLE

The data used herein are from a large research project based on a prospective cohort design study in which abused and/or neglected children were matched with nonvictimized children and followed up prospectively into young adulthood. Because of the matching procedure, the subjects are assumed to differ only in the risk factor: ie, having experienced childhood abuse or neglect. Because it is not possible to randomly assign subjects to groups, the assumption of equivalency for the groups is an approximation.

Cases were drawn from the records of county juvenile and adult criminal courts in a metropolitan area in the Midwest from January 1, 1967, through December 31, 1971. The rationale for identifying the abused and neglected group was that their cases were serious enough to come to the attention of the authorities. Only court-substantiated cases of child abuse and neglect were included. Abuse and neglect cases were restricted to those in which the children were younger than 12 years at the time of the abuse or neglect incident. Excluded from the sample were court cases that represented (1) adoption of the child as an infant, (2) "involuntary" neglect only—usually resulting from the temporary institutionalization of the legal guardian, (3) placement only, or (4) failure to pay child support.

Physical abuse cases included injuries such as bruises, welts, burns, abrasions, lacerations, wounds, cuts, bone and skull fractures, and other evidence of physical injury. Sexual abuse charges varied from relatively nonspecific charges of "assault and battery with intent to gratify sexual desires" to more specific charges of "fondling or touching in an obscene manner," rape, sodomy, and incest. Neglect cases reflected a judgment that the parents' deficiencies in child care were beyond those found acceptable by community and professional standards at the time. These cases represented extreme failure to provide adequate food, clothing, shelter, and medical attention to children.

A critical element of the design involved the selection of a comparison group, matched with the maltreated sample based on age, sex, race/ethnicity, and approximate family social class during the period under study. Matching for approximate family social class was important in this study because it is theoretically plausible that any relationship between child abuse and neglect and subsequent outcomes may be confounded with or explained by social class differences.^{10,22} It is difficult to match

exactly for social class because higher-income families could live in lower social class neighborhoods and vice versa. The matching procedure used herein is based on a broad definition of social class that includes neighborhoods in which children were reared and schools they attended. Similar procedures, with neighborhood school matches, have been used in studies of schizophrenics²³ to match approximately for social class. The control group establishes the base rates of psychiatric disorders we would expect in a sample of adults from comparable circumstances who did not come to court attention in childhood as victims of abuse or neglect.

Where possible, 2 matches were found to allow for loss of comparison group members. Thus, individuals who were initially selected for the comparison group who were reported in the official abuse and neglect files were eliminated and replaced, where possible, with a second matched comparison subject. Any comparison group child with an official record of abuse or neglect was eliminated, regardless of whether the record was before or after the period of the study. This occurred in 11 cases.

Children who were younger than school age at the time of the abuse and/or neglect were matched with children of the same sex, race, date of birth (± 1 week), and hospital of birth through the use of county birth record information. For children of school age, records of more than 100 elementary schools for the same period were used to find matches with children of the same sex, race, date of birth (± 6 months), class in elementary school from 1967 through 1971, and approximate home address. Overall, there were matches for 73.5% of the abused and neglected children.

We were not able to find matches for the abused and/or neglected child for several reasons: (1) information about the date of birth was missing for the abused or neglected child, (2) the abused or neglected child was born outside the county and/or state, (3) the elementary school that the abused or neglected child attended had closed since 1971 and class registers were not available, and (4) the school was not integrated at the time and a same race match could not be found.

Initially, we examined official criminal histories for the abused and/or neglected children and compared them with those of the matched comparison group ($n = 1575$).²⁴ For this article, we used data from the second phase of the study, which involved tracing, locating, and interviewing the abused and/or neglected children and comparison group members a mean of 22.3 years later (SD, 2.1 years; range, 17-28 years). Two-hour in-person interviews that included a series of structured and semi-structured questionnaires and rating scales were conducted between October 20, 1989, and December 22, 1995, obtaining information about cognitive, intellectual, emotional, psychiatric, social, and interpersonal functioning.

The interviewers were blind to the purpose of the study, to the participants' group membership, and to the inclusion of an abused and/or neglected group. Similarly, the subjects were blind to the purpose of the study and were told they had been selected to participate as part of a large group of individuals who grew up in that area in the late 1960s and early 1970s. After a complete description of the study was provided to the subjects, subjects signed a consent form acknowledging that they were participating voluntarily. Institutional review board approval was obtained for the procedures involved in this study. For those individuals with limited reading ability, the consent form was read and, if necessary, explained verbally.

Of the original sample of 1575 subjects (908 abused and/or neglected individuals and 667 controls), 1307 (83.0%) were located and 1196 (75.9%) were interviewed. Of the people not interviewed, 43 were deceased (before the interview), 8 were incapable of being interviewed, 268 were not found, and 60 refused to participate (a refusal rate of 3.8%). There were no significant differences between the interviewed follow-up sample

(n = 1196) and the original sample (N = 1575) in terms of demographic characteristics (male [$P = .28$], white [$P = .10$], poverty in childhood census tract [$P = .44$], or current age [$P = .88$]) or group status (abused or neglected group vs comparison group) ($P = .11$).

Approximately half the sample (48.7%) is female and about two thirds (62.9%) is white. The mean age of the sample at the follow-up interview was 28.7 years (SD, 3.8 years). There were no differences in the demographic characteristics of the 2 groups (abused and/or neglected and matched controls) for sex, race/ethnicity, or age. Sample members completed a mean of 11.47 (SD, 2.19) years of school. The median occupational level²⁵ for the sample was semiskilled workers, with less than 7% in levels 7 to 9 (managers to professionals). Thus, the sample is skewed toward the lower end of the socioeconomic spectrum.

DIAGNOSTIC ASSESSMENT

The National Institute of Mental Health Diagnostic Interview Schedule, Version III Revised,²⁶ was used to assess MDD according to *DSM-III-R* criteria.²⁷ Prevalence data are presented for lifetime and current MDD. *Lifetime prevalence* refers to the proportion of the group who ever experienced an episode of MDD. *Current prevalence* refers to the proportion who experienced MDD sometime within the past year (12 months before the interview). We also report the number of depression symptoms, using the 9 categories outlined in the *DSM-III-R* (depressed mood, diminished interest in activities, lost appetite, insomnia, psychomotor retardation, fatigue, worthlessness, diminished ability to concentrate, and thoughts of death). All symptoms were assessed, even if depressed mood or loss of interest was not indicated and, thus, symptom scores ranged from 0 to 9.

Based on the literature when the study was initiated, we also assessed a limited number of other *DSM-III-R* psychiatric disorders, including posttraumatic stress disorder (PTSD), generalized anxiety disorder, alcohol abuse and/or dependence, other drug abuse and/or dependence, antisocial personality disorder, and dysthymia. Lifetime and past year (12-month) comorbidity refers to the extent to which individuals with lifetime MDD also met the criteria for at least 1 other *DSM-III-R* disorder assessed herein.

The Diagnostic Interview Schedule, Version III Revised, is a highly structured interview schedule designed for use by lay interviewers. The survey company who had used these methods as part of the Epidemiological Catchment Area studies²⁸ was hired to conduct the interviews. Field interviewers received a week of study-specific training and successfully completed practice interviews before beginning the study interviews. Field interviewer supervisors recontacted a random 10% of the respondents for quality control. Frequent contacts between field interviewers and supervisors were held to prevent interview drift, to monitor quality, and to provide continuous feedback. Computer programs for scoring the Diagnostic Interview Schedule, Version III Revised, were used to compute *DSM-III-R* diagnoses. Adequate reliability for the Diagnostic Interview Schedule has been reported.²⁹

STATISTICAL ANALYSIS

Cross tabulations are based on the Pearson χ^2 statistic. Logistic regression analysis was used to examine the effects of child abuse and neglect on dichotomous dependent variables (eg, lifetime and current MDD diagnoses). Logistic regression coefficients were transformed into odds ratios for ease of interpretation, and 95% confidence intervals were estimated. An analysis of variance was used to compare groups on the number of de-

pression symptoms, age at onset of symptoms, and number of episodes of depression. Logistic and ordinary least-square regressions and analyses of variance were repeated, with adjustments for the individual covariates of age, sex, and race/ethnicity. Results were similar with and without the covariates (with 1 exception), so unadjusted numbers are reported. In the 1 case in which the adjustment changed the results, the adjusted odds ratio is reported. The Kaplan-Meier product-limit technique³⁰ was used to generate age-at-onset curves. This non-parametric technique evaluates the survival function at the observed event times (age at onset of MDD for uncensored cases and age at interview for censored cases [those who had not yet developed MDD]). The log-rank statistic (Mantel-Cox) was used to test for differences between the survival functions, weighing all cases equally. The number of subjects varied slightly in each analysis because of missing data. Statistical significance was set at $P = .05$, and a commercially available software program (SPSS, version 10.1.0; SPSS Inc, Chicago, Ill) was used for analyses.

Propensity scores are sometimes used as a covariate to control for potential biases that might be associated with the imperfect matching between groups.³¹ Although Cepeda et al³² recommend using logistic regression over propensity score estimates for studies (like ours) with at least 8 observations per covariate, we conducted propensity score analyses to rule out the possibility of biased estimates. Propensity scores were calculated with the variables used to match the groups (age, sex, and race/ethnicity) following recommended procedures, and the results were comparable to those with the binary logistic regressions. Thus, for ease and familiarity to the reader, we present the results of logistic regressions.

Comparisons are reported for the abuse and/or neglect group vs controls overall and for children who had experienced specific types of abuse or neglect (physical abuse, n = 106; sexual abuse, n = 96; and neglect, n = 541) and for those who had experienced more than 1 type of abuse or neglect ("multiple" abuse, n = 70). These categories are not mutually exclusive. The multiple group consists of 47 cases of physical abuse and neglect, 13 cases of sexual abuse and neglect, 7 cases of sexual and physical abuse, and 3 cases of sexual and physical abuse and neglect. Thus, the numbers reflecting the individual types of abuse and neglect add up to more than the total number of abused and neglected children in the sample.

RESULTS

CHILDHOOD ABUSE AND NEGLECT AND MDD

Lifetime and current (past year) prevalence rates for *DSM-III-R* MDD are presented in **Table 1** for the control group, the abused and/or neglected group as a whole, and specific types of abuse (any neglect, any physical abuse, any sexual abuse, and multiple types of abuse). Overall, about a quarter of the abused and/or neglected group met the criteria for lifetime MDD compared with one fifth of the comparison group. This difference did not meet conventional standards of significance ($P = .08$). Of the specific types of child maltreatment, individuals who experienced any physical abuse or multiple forms of abuse or neglect (adjusted odds ratio, 1.72; 95% confidence interval, 0.98-3.02; $P = .06$) were at elevated risk for MDD.

Overall, more abused and/or neglected individuals met the criteria for current (past year) MDD than those in the control group. Specifically, neglected children were at increased risk for current MDD compared with those in the

Table 1. Prevalence of DSM-III-R Major Depressive Disorder in Abused and/or Neglected Children Grown Up and in Matched Control Subjects*

Group	Total No. of Subjects	Major Depressive Disorder Diagnosis					Lifetime Depression Symptoms		
		Lifetime		Current		Mean (Unadjusted)	SD	F Value	
		No. (%) of Subjects	OR (95% CI)	No. (%) of Subjects	OR (95% CI)				
Control	520	108 (20.8)	NA	55 (10.6)	NA	3.09	2.65	NA	
Abused or neglected	676	169 (25.0)	1.27 (0.96-1.67)	102 (15.1)	1.51 (1.06-2.14)†	3.61	2.75	10.65‡	
Any neglect	541	137 (25.3)	1.28 (0.96-1.70)	86 (15.9)	1.59 (1.10-2.29)‡	3.64	2.74	10.93§	
Any physical abuse	106	32 (30.2)	1.59 (1.00-2.52)†	15 (14.2)	1.34 (0.72-2.46)	3.53	2.81	2.40	
Any sexual abuse	96	23 (24.0)	1.20 (0.72-2.01)	11 (11.5)	1.09 (0.55-2.18)	3.77	2.74	5.26†	
Multiple abuse	70	22 (31.4)	1.75 (1.01-3.02)†	10 (14.3)	1.41 (0.68-2.91)	3.90	2.71	5.71†	

Abbreviations: CI, confidence interval; NA, data not applicable; OR, odds ratio (unadjusted).

*Statistical comparisons are between the childhood maltreatment group and matched controls. The numbers of cases of specific types of abuse and/or neglect do not add up to the total in the abuse/neglect group (n = 676) because some individuals experienced more than 1 type of abuse or neglect (reflected in the "multiple abuse" group).

†P ≤ .05.

‡P < .01.

§P < .001.

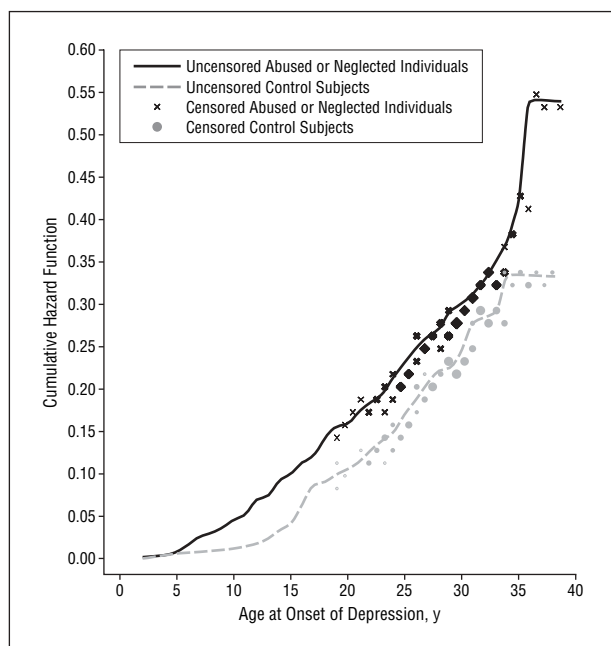


Figure 1. Results of separate curves for abused and neglected individuals and matched control subjects for age at onset of depression using the Kaplan-Meier method. The cumulative hazard function shows the probability of major depressive disorder at each age given the absence of major depressive disorder earlier in life. Uncensored cases are shown at the age at onset of major depression; censored cases are shown at the participant's age at the interview. The size of the symbol for the censored cases reflects the number of cases at that age. Log-rank statistic=4.03; $df=1$; $P=.04$.

matched comparison group, whereas children who had experienced other types of maltreatment were not.

Table 1 shows that individuals who had been abused and/or neglected in childhood generally had significantly more lifetime depression symptoms than controls. In particular, adults with histories of childhood neglect, sexual abuse, and multiple types of abuse and neglect reported more symptoms of depression than controls. Although not shown in Table 1, abused and/or neglected

children also experienced significantly more episodes of depression (mean, 16.37 episodes; SD, 31.08 episodes) than matched controls (mean, 9.04 episodes; SD, 21.51 episodes) through young adulthood ($F_{1,479}=8.16$; $P<.01$).

AGE AT ONSET OF DEPRESSION

We used 2 statistical techniques to determine whether there were differences between abused and neglected individuals and matched controls in the age at onset of depression. First, using analysis of variance, our findings show that the mean age at onset of depression was significantly earlier in the abused and neglected group (mean, 18.2 years; SD, 7.6 years) than in the controls (mean, 20.8 years; SD, 6.7 years) ($F_{1,273}=8.20$; $P=.01$). Second, based on separate Kaplan-Meier curves generated for the 2 groups (**Figure 1**), the log-rank statistic (value, 4.03; $df=1$; $P=.04$) indicates that the curves are significantly different from one another. The 2 groups (abused and/or neglected and controls) begin to diverge at an early age (<10 years) and the differences in the slopes continue throughout the assessment period.

COMORBIDITY

Overall, 91.3% of those with lifetime MDD in the sample also met the criteria for at least 1 of the other DSM-III-R disorders assessed herein. Of those with lifetime MDD, significantly more of the abused and neglected children (96.4%) than controls (83.4%) met the criteria for at least 1 other lifetime diagnosis, including PTSD, drug abuse and/or dependence, antisocial personality disorder, and dysthymia (**Table 2**). More than three quarters (86.4%) of the abused and neglected participants (compared with 72.2% of the controls) with lifetime MDD met the criteria for at least 1 current DSM-III-R disorder, including PTSD, generalized anxiety disorder, and drug abuse and/or dependence. Among those with current MDD, 79.4% of the abused and neglected group, compared with 69.1% of the

Table 2. Comorbidity of Major Depressive and Other Psychiatric Disorders in Abused and/or Neglected Children and Matched Control Subjects Followed Up Into Young Adulthood

Comorbidity	Those With Lifetime Major Depressive Disorder (n = 277)				Other Current Diagnosis Among Those With Current Major Depressive Disorder (n = 157)	
	Other Lifetime Diagnosis		Other Current Diagnosis		% of Subjects	OR (95% CI)
	% of Subjects	OR (95% CI)	% of Subjects	OR (95% CI)		
PTSD						
Abused or neglected subjects	63.7	2.46 (1.50-4.03)*	39.1	2.24 (1.30-3.88)†	48.0	2.47 (1.21-5.01)†
Controls	41.7	NA	22.2	NA	27.3	NA
GAD						
Abused or neglected subjects	20.1	1.56 (0.81-3.03)	18.9	2.57 (1.17-5.62)‡	24.5	1.91 (0.80-4.58)
Controls	13.9	NA	8.3	NA	14.5	NA
ALCOHOL						
Abused or neglected subjects	64.9	1.13 (0.69-1.87)	27.2	0.97 (0.57-1.67)	30.4	0.98 (0.48-1.99)
Controls	62.0	NA	27.8	NA	30.9	NA
DRUG						
Abused or neglected subjects	56.2	1.68 (1.03-2.73)‡	16.6	2.18 (1.00-4.83)‡	20.6	1.78 (0.70-4.49)
Controls	43.4	NA	8.3	NA	12.7	NA
ASPD						
Abused or neglected subjects	31.4	2.01 (1.12-3.61)‡	20.6	1.86 (0.97-3.57)	22.5	1.49 (0.64-3.49)
Controls	18.5	NA	12.7	NA	16.4	NA
Dysthymia						
Abused or neglected subjects	43.2	2.28 (1.34-3.88)†	15.4	1.22 (0.61-2.46)	22.5	0.94 (0.43-2.04)
Controls	25.0	NA	13.0	NA	23.6	NA

Abbreviations: ALCOHOL, alcohol abuse and/or dependence diagnosis; ASPD, antisocial personality disorder; CI, confidence interval; DRUG, drug abuse and/or dependence diagnosis; GAD, generalized anxiety disorder; NA, data not applicable; OR, odds ratio (unadjusted); PTSD, posttraumatic stress disorder.

* $P < .001$.

† $P < .01$.

‡ $P \leq .05$.

controls, met the criteria for another current disorder, although the only significant difference was for PTSD.

We examined the extent to which the onset of MDD occurred before the onset of the other comorbid psychiatric disorders, at the same time as the other disorders (during the same year), or after the onset of the other disorders (**Table 3**). In general, the pattern regarding the timing of comorbid psychiatric disorders in individuals with MDD did not differ between the abused and neglected and control groups. For example, in individuals with lifetime MDD, the MDD occurred more often after PTSD (secondary to PTSD) than before PTSD for both groups. However, there are 2 instances during which there were significant differences between the groups in the timing of comorbidity—with alcohol and other drug diagnoses. As seen in **Figure 2**, controls are significantly more likely than abused and/or neglected individuals to have MDD after drug abuse and/or dependence (76.1% vs 46.8%; $P < .001$) or alcohol abuse and/or dependence (58.2% vs 40.2%; $P = .04$) diagnoses. In contrast, abused and/or neglected individuals are more likely than controls to have MDD before drug abuse and/or dependence (40.4% vs 17.4%; $P < .01$).

COMMENT

This first prospective long-term investigation of risk for MDD in abused and neglected children followed up into young adulthood extends previous findings in

several important ways. The current results show that childhood physical abuse was associated with increased risk for lifetime MDD. While these results are consistent with earlier cross-sectional studies reporting a relationship between physical abuse and depression, because of the longitudinal nature of the design, our results establish the temporal relationship (ie, depression is an important consequence of childhood physical abuse).

We also provide new evidence that neglected children are at increased risk for depression as well. These results underscore the need to detect and treat the long-term psychological sequelae of childhood neglect. Approximately one quarter of the neglected children in our sample met the criteria for lifetime MDD, and 15% for current MDD. Given that neglect represents almost two thirds of the reported and substantiated cases of child maltreatment in the United States,¹ more attention needs to be paid to these children. In addition, these findings reveal that onset of depression began in childhood for many of the children. Our age-at-onset findings reinforce the need to intervene early in the lives of these abused and neglected children, before depression symptoms cascade into other spheres of functioning.

These results may not seem consistent with previous studies describing a relationship between childhood sexual abuse and depression, because we did not find evidence of elevated risk for lifetime or current MDD. However, childhood victims of sexual abuse reported significantly

Table 3. Age at Onset of Comorbid Psychiatric Disorders in 277 Abused and/or Neglected Individuals and Matched Control Subjects With Major Depressive Disorder

Comorbid Psychiatric Disorder	Occurrence of Major Depressive Disorder in Relation to Comorbidity*			χ^2 Value (P Value)†
	Occurred Before	Occurred at the Same Time	Occurred After	
PTSD				
Abused or neglected subjects (n = 104)	31 (29.8)	18 (17.3)	55 (52.9)	0.66 (.72)
Controls (n = 45)	14 (31.1)	10 (22.2)	21 (46.7)	
DRUG				
Abused or neglected subjects (n = 94)	38 (40.4)	12 (12.8)	44 (46.8)	10.80 (.01)
Controls (n = 46)	8 (17.4)	3 (6.5)	35 (76.1)	
ALCOHOL				
Abused or neglected subjects (n = 107)	48 (44.9)	16 (15.0)	43 (40.2)	5.88 (.05)
Controls (n = 67)	23 (34.3)	5 (7.5)	39 (58.2)	
GAD				
Abused or neglected subjects (n = 33)	7 (21.2)	15 (45.5)	11 (33.3)	3.36 (.19)
Controls (n = 15)	7 (46.7)	4 (26.7)	4 (26.7)	
Dysthymia				
Abused or neglected subjects (n = 71)	14 (19.7)	40 (56.3)	17 (23.9)	0.43 (.81)
Controls (n = 27)	4 (14.8)	17 (63.0)	6 (22.2)	
ASPD				
Abused or neglected subjects (n = 52)	0	1 (1.9)	51 (98.1)	0.39 (.72)
Controls (n = 20)	0	0	20 (100.0)	

Abbreviations: See Table 2.

*Data are given as number (percentage) of subjects.

† χ^2 Value overall (2 × 3 comparison).

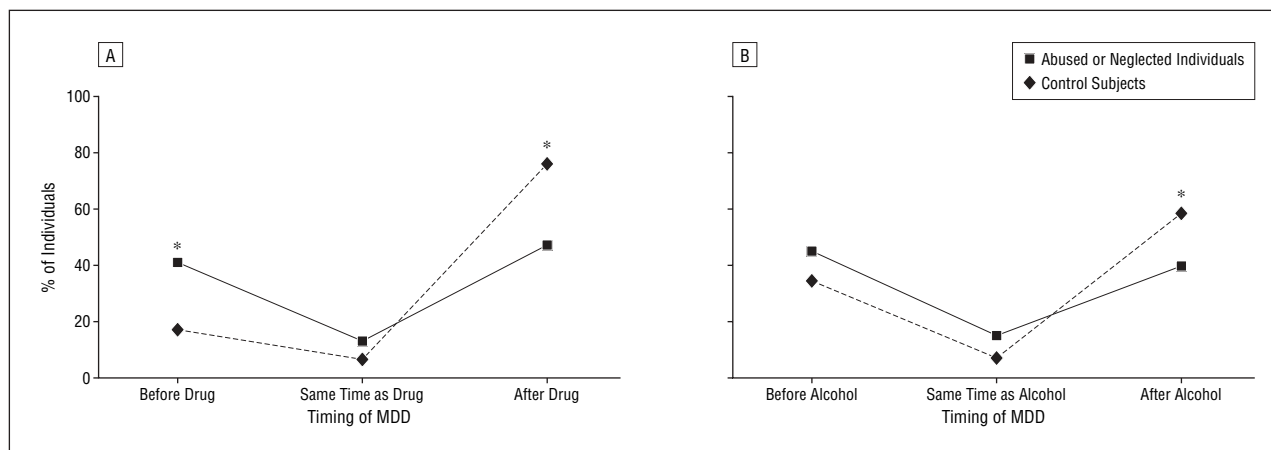


Figure 2. The occurrence of age at onset of major depressive disorder (MDD) (before, at the same time, or after) in relation to the onset of drug (A) and alcohol (B) abuse and/or dependence diagnoses in abused and neglected individuals and matched control subjects followed up into young adulthood. The asterisks reflect a significant difference in proportions between abused and neglected individuals and controls. More abused and/or neglected individuals had MDD before drug abuse and/or dependence ($P=.01$), and more individuals in the control group had MDD after drug abuse and/or dependence ($P=.001$) and after alcohol abuse and/or dependence ($P=.02$).

more depression symptoms than controls. Interestingly, most prior studies relating child sexual abuse and depression have used checklists to assess depression rather than conducting psychiatric assessments and assigning diagnoses, such as used herein. It is possible that these differences in outcome measures may in part explain our findings. It is also possible that these court cases of sexual abuse received treatment that, in turn, would reduce the risk for MDD. Although possible, this explanation is not likely, because these cases of sexual abuse were primarily from the adult criminal court at a time in history (late 1960s and early 1970s) when few services were provided for childhood victims of sexual abuse.

A further possibility is that the lack of findings regarding sexual abuse is due to weak statistical power to detect differences because of the relatively small sample of sexual abuse cases. However, power is affected by sample size and effect size. In a previous article¹⁸ using data from the same study, we found that individuals with documented histories of childhood sexual abuse were at increased risk for PTSD (a large effect size). Thus, it would be difficult to conclude that limited power only explains the lack of increased risk for childhood sexual abuse victims studied herein. Nevertheless, differences in the design of our study (prospective longitudinal with documented cases of maltreatment) may in part account for

the discrepancy between our findings and the larger extant literature (cross-sectional and based on retrospective recall).

The high rates of comorbidity in these young adults with documented histories of abuse and neglect in childhood have potential implications for the treatment and management of individuals who present with comorbid MDD and other psychiatric disorders.²¹ Some researchers^{6,12} have questioned whether child abuse and neglect per se cause subsequent problems or whether the adverse environments in which abused and neglected children typically exist influence the negative adult outcomes. However, child abuse and neglect may lead to certain disorders that, in turn, increase risk for other disorders. For example, Schuckit et al³³ proposed that the social and interpersonal problems associated with alcohol dependence place individuals at heightened risk to develop depression. In the child maltreatment field, 1 common hypothesis is that abused and neglected individuals turn to alcohol or other drugs to self-medicate.³⁴ On the other hand, substance use may represent self-medication in an attempt to deal with the symptoms of other psychiatric disorders, such as MDD, generalized anxiety disorder, or PTSD. Our findings provide support for at least 2 pathways to MDD. First, for controls (individuals with no documented case of childhood maltreatment), MDD seemed to be secondary to alcohol and other drug problems (ie, most controls reported the onset of MDD after alcohol or other drug abuse and/or dependence). For abused and/or neglected individuals, our findings provide support for the "self-medication" hypothesis, because a substantial portion of the maltreated group reported MDD before alcohol or other drug abuse and/or dependence.

Despite its strengths, several limitations of this study should be noted. (1) Our findings are based on cases of childhood abuse and neglect drawn from official court records and most likely represent the most extreme cases processed in the system. This means that our findings are not generalizable to unreported or unsubstantiated cases of child abuse and neglect. If there is unreported abuse or neglect in the control group, then this may underestimate the association between child maltreatment and adult depression. (2) Officially reported cases of child abuse and neglect are generally skewed toward the lower end of the socioeconomic spectrum. Thus, these findings cannot be generalized to child abuse and neglect cases that occur in middle- or upper-class children and their families. Indeed, the consequences of abuse and neglect for children in higher socioeconomic status families may be manifest in ways quite different from those for the children in the present study. (3) These findings represent the experiences of a group of young children (≤ 11 years at the time of maltreatment) during the late 1960s and early 1970s in the midwestern part of the United States. Our findings may not be generalizable to children abused and neglected at an older age (in adolescence), at a later point in time (the 1990s or at present), or from other parts of the country. (4) Because much childhood victimization occurs in the context of multiproblem homes, the maltreatment may be a marker of other family problems that together lead to the development of depressive dis-

orders. These findings do not take into account the likely contribution of hereditary influences on the predisposition to become depressed.³⁵ Depressed parents may be more likely to abuse their children and transmit depressive genes to their offspring.

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Correspondence: Cathy Spatz Widom, PhD, Department of Psychiatry, New Jersey Medical School, 183 S Orange Ave, Behavioral Health Sciences Building F1406, Newark, NJ 07103 (widomca@umdnj.edu).

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