Familial Transmission of Suicidal Behavior: Factors Mediating the Relationship Between Childhood Abuse and Offspring Suicide Attempts

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Background: Self-reported childhood sexual abuse is associated with major depression and with suicidal behavior. The current study investigates the relationship between reported childhood abuse and the familial transmission of suicidal behavior and other related risk factors.

Method: 507 offspring of 271 parent probands with DSM-IV major depressive disorder were compared according to the reported childhood abuse history on demographic, diagnostic, and clinical variables related to risk for suicidal behavior. Both self-report and clinical interview measures assessed history of childhood physical and sexual abuse. The study was conducted from May 1997 to February 2004.

Results: Reported childhood sexual abuse, but not physical abuse, in the proband correlated with suicide attempts, posttraumatic stress disorder, earlier onset of major depressive disorder, higher levels of impulsivity, and greater likelihood of childhood sexual abuse in the offspring and was rarely perpetrated by the affected parent. A reported history of childhood physical abuse was related to more lifetime aggression in the offspring.

Conclusions: Reported childhood sexual abuse is a risk factor for suicidal behavior in parent and offspring. Transmission of suicide risk across generations is related to the familial transmission of sexual abuse and impulsivity. Sexual abuse is not directly transmitted by the victim to the next generation and may be related to family dynamics related to sexual abuse.

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Twin,[1,2] family,[3–5] and adoption[6] studies have demonstrated the familial transmission of suicidal behavior. One set of causes of transmission of suicidal behavior is familial transmission of psychiatric illnesses, such as mood disorder and substance use disorder.[4,7–10] However, since increased suicidal risk persists even after controlling for familial transmission of major psychiatric disorders,[11–13] other factors must also mediate the transmission of suicidal behavior from one generation to the next.

Twin studies find that genetic factors account for about half of the variance,[2,13] and that environmental factors such as familial instability and childhood abuse contribute independently to the transmission of suicidal behavior.[11,14–19] Studies that control for other indices of familial instability[20,21] have identified sexual abuse of the individual as a factor that accounts for almost 20% of the population attributable risk for suicide attempt in young people. Higher rates of suicidal behavior,[7,12,22] Axis I and Axis II psychiatric diagnoses such as major depression,[9,23] substance use disorder, antisocial[24] and borderline personality disorder, and more severe aggressive and impulsive personality traits,[10,24] in the first-degree relatives of suicide attempters and completers compared with controls, suggest that both Axis I and traits related to impulsive aggression and mood instability underlie familial transmission of suicidal behavior.

Based on a comprehensive high-risk prospective study of the risk factors for familial transmission of suicidal

TAKE-HOME POINTS

- A history of childhood sexual abuse is a risk factor for suicidal behavior in adulthood.
- Childhood sexual abuse in a patient is a risk factor for suicidal behavior in that patient's offspring.
- Assessment for suicide risk should include taking a history of childhood abuse as well as family history of childhood abuse.

behavior, 2 reports by our group[4,5] have documented that the offspring of parent probands with a lifetime diagnosis of major depressive disorder and at least 1 lifetime suicide attempt were 6 times more likely to make a suicide attempt compared with offspring of depressed nonattempters. Imitation was ruled out as a mediating factor. In addition to the transmission of a mood disorder, the familial transmission of suicidal behavior was related to reported sexual abuse in the proband, and to greater impulsive aggression and reported childhood sexual abuse in offspring. Although sexual abuse is a known risk factor for suicidal behavior within the same individual,[16,25] the factors mediating the relationship between familial transmission of sexual abuse and of suicidal behavior are not well understood.

We previously reported in a smaller sample (136 probands, 299 offspring) that parental sexual abuse increased the risk of a suicide attempt in the child via 2 pathways: increased risk of child sexual abuse and increased level of child impulsive aggression, both of which increased the risk for childhood mood disorder and attempt.[4] We now extend those findings in a larger sample and examine the impact of the characteristics of both physical and sexual abuse on risk for attempt in offspring to identify possible mediating factors, since the severity and chronicity of both types of abuse have been related to suicidal risk.[26,27] Furthermore, we examine a wider range of pathways, such as the impact of a reported childhood abuse in the proband on early-onset depression, posttraumatic stress disorder (PTSD), substance use disorder, and comorbid borderline traits and disorder in offspring, all of which contribute to suicidal risk and may affect familial transmission as well.

METHOD

See Brent et al.[4] for a full description of sample and recruitment methods. The current sample comprises a total of 271 probands, inpatients and outpatients, aged 18 to 65 years, diagnosed with major depressive disorder, and their offspring (N = 507), aged 10 years and above, recruited from 2 university hospital inpatient units (Western Psychiatric Institute and Clinic [WPIC] and New York State Psychiatric Institute [NYSPI]) and from outpatient clinics from the 2 university hospital communities. Initially, probands (N = 74, 27%) were recruited from a pool of previous participants in biologic studies of suicidal behavior, last assessed 4 to 8 years previously. The remainder of the probands were recruited from inpatient and outpatient clinics in Pittsburgh and New York (N = 197, 73%) using the same inclusion and exclusion criteria. Probands provided contact information for offspring. Written informed consent was obtained as required by the institutional review boards of the University of Pittsburgh, St. Francis Medical Center, and NYSPI. The study was conducted from May 1997 to February 2004.

Assessment

Axis I disorders. All subjects aged 18 years and older were assessed for the presence of lifetime and current DSM-IV psychiatric disorders using the Structured Clinical Interview for DSM-IV (SCID-I).[28] Offspring aged 10 through 17 years were assessed with regard to Axis I disorders using the Schedule for Affective Disorders and Schizophrenia for School-Age Children-Present and Lifetime Version[29] (K-SADS-PL). History of suicidal behavior was assessed using the Columbia University Suicide History Form (available from the authors on request), the Medical Damage Lethality Rating Scale,[30] and the Beck Suicide Intent Scale[31] for the current and most severe attempts in proband and in all offspring 10 years and older.

Childhood abuse. In subjects 18 years and older, history of childhood physical and sexual abuse was assessed with 3 distinct measures. The first was a series of screening questions in our demographic questionnaire. These questions asked (1) for any history of physical and/or sexual abuse over lifetime; (2) if yes, code if physical, sexual, or both; and (3) if yes, did abuse take place before age 15 years? We obtained this information for 269 of the 271 probands and all 231 adult (aged 18 years and above) offspring. Reliability of the initial assessment was moderate for physical abuse ($\kappa = 0.41$, SE = 0.11) and high for sexual abuse ($\kappa = 0.74$, SE = 0.11). Second, as part of a 1-year follow-up, a subset of the proband subjects (N = 222) and a subset of offspring subjects 18 years and older (N = 205) were reassessed with a self-report measure of childhood trauma, the Childhood Experiences Questionnaire.[32] Study participants were instructed to report on the age period of 0 to 15 years. In addition to presence or absence of physical and/or sexual abuse, the Childhood Experiences Questionnaire assesses age at on-

set, severity, duration, and perpetrator of abuse. Third, in ongoing follow-up interviews as part of our prospective study of familial transmission of suicidal behavior, an interview measure of early childhood adverse experiences called the Childhood and Adolescence Review of Experiences (CARE)[33] was administered to a subsample of 198 probands and 339 offspring aged 10 years and over. The CARE retrospectively assesses the presence or absence of physical and/or sexual abuse, age at onset, severity, duration, and perpetrator of abuse between the ages of 0 and 18 years, and was based on a self-report measure with acceptable psychometric properties.[34] Other sources of data were the PTSD section of the SCID-I interview and comprehensive clinical notes completed by the raters on each subject.

Definition of abuse and assignment of probands to study groups. In order to optimize assessment of childhood abuse history in the probands, we compared the data obtained from these 3 measures. First, a subgroup of coauthors with expertise in the study and assessment of childhood abuse (B.S.B., B.S., J.Z., A.K.B., and D.B.) reached consensus on the operational definitions of childhood physical and sexual abuse, setting the minimum cutoff defining physical abuse at a score of 4 on the CARE measure for level of severity of medical consequences (bruising), whereas a score of 3 involved physical contact with limited surface injury and a score of 5 involved being hit with an object. The cutoff severity for presence of sexual abuse was set at level 4 for exposure (fondling underneath clothes) to reduce diagnostic ambiguity but at some cost in terms of sensitivity. A score of 3 involves fondling over the clothes, and a score of 5 is defined by simulated intercourse over clothes. All probands (N = 271) were assessed with the screening questions. The CARE was only administered to a subset of the proband sample (198/271 probands for physical abuse, 196/271 for sexual abuse). In the assessment of physical abuse, there was 81% agreement between the CARE and the series of screening questions (159/196, $\kappa = 0.59$). For sexual abuse, there was 87% agreement between the CARE and the screening questions (169/194, $\kappa = 0.74$).

The disagreement between measures was in the direction of underreporting—in most cases, research participants said no to the screening questions, but when interviewed with the CARE, they described experiences that met the research criteria for abuse.

We then reviewed all of the research charts of the individuals who were only administered the series of screening questions and those with discrepancies between the screening questions and the CARE. Using rater notes from the PTSD section of the SCID-I, the Childhood Experiences Questionnaire self-report measure, or other notes from our comprehensive history taking, we were able to supplement the screening questions with more qualitative information that allowed us to be sure the proband did or did not meet the established criteria for physical and/or sexual abuse. Four proband study groups were created using the CARE criteria: no abuse, sexual abuse only, physical abuse only, or both sexual and physical abuse. This resulted in the inclusion of 271 probands, and the exclusion of 7 probands for whom we could not determine the status of their history of childhood abuse. There were no differences in demographic or clinical variables between the included or excluded probands.

Measuring abuse in the offspring. We followed the same procedure to determine the presence or absence of abuse in the adult offspring. There was 91% agreement between the CARE and screening questions regarding the reporting of physical abuse (111/122, $\kappa = 0.64$) and sexual abuse (110/121, $\kappa = 0.65$) in the adult offspring. Therefore, the CARE measure alone was used to assess childhood abuse in the child offspring.

For descriptive purposes, probands were divided into 4 study groups according to their report of a history of childhood abuse on the interview screening questions: of 271 probands, 155 (57.2%) reported no history of childhood abuse, 34 (12.5%) were classified as having reported childhood physical abuse only, 47 (17.3%) were classified as having reported childhood sexual abuse only, and 35 (12.9%) were classified as having reported a history of both physical and sexual abuse as a child. Child and adult offspring were divided into 4 study groups based on the reported childhood abuse histories of their parent. Of 507 offspring, 294 (58.0%) had a proband parent without reported childhood abuse, 63 (12.4%) had a parent proband with childhood physical abuse, 89 (17.6%) had a parent proband reporting childhood sexual abuse only, and 61 (12.0%) had a parent proband reporting experiencing both physical and sexual childhood abuse.

Axis II disorders. Personality disorders were diagnosed using the Structured Clinical Interview for DSM-IV Axis II Personality Disorders (SCID-II)[35] in all subjects aged 18 years and older. Lifetime aggression severity was rated using the 11-item Brown-Goodwin Lifetime History of Aggression (BGLHA)[36] interview in all subjects because it has sections for scoring aggression in childhood, adolescence, and adulthood. Tendency to impulsive aggression was assessed by the Buss-Durkee Hostility Inventory (BDHI)[37] in all subjects over age 14 years. In youth aged 10 to 13 years, the downward extension of the BDHI, the Children's Hostility Inventory,[38] was used. A transformed z score was calculated to combine the adult and child versions of the hostility inventory. In subjects aged over 18 years, impulsivity was assessed using the Barratt Impulsivity Scale (BIS).[39] In subjects aged 10 to 17 years, the 5-item impulsivity subscale of the Iowa Conners Parent Physical Report[40] was used.

Measures of depression. Objective levels of depression were assessed with the Hamilton Rating Scale for Depression[41] in adults, and with the Children's Depression

Rating Scale[42] in child offspring. The Beck Depression Inventory[43] rated subjective depression severity in adults, and the Children's Depression Inventory[44] was used to assess subjective depression in child offspring. Hopelessness was assessed by the self-report Beck Hopelessness Scale.[45]

Diagnostic procedure. All interviewers were at least master's level clinicians or psychiatric nurses who received extensive training in the administration of semi-structured interviews. Assessments of offspring and of probands were conducted blind to each other. Within- and cross-site reliability was high on the SCID-I, SCID-II, K-SADS-PL, Columbia University Suicide History Form, and BGLHA (intraclass correlations = 0.82 to 0.98, κ = 0.86 to 0.95).

Data Analysis

Data for the 2 sites were combined after ascertaining that differences between sites and cohort were not contributing to any risk factor by site or cohort interactions with regard to familial transmission. There were some significant differences between sites and cohorts in terms of the variables of interest.

Between site differences. A higher percentage (50.6%) of WPIC probands reported a history of childhood abuse (either physical or sexual) than did NYSPI probands (29.7%, $\chi^2 = 17.5$, $p = .0005$). A higher percentage (33.5%) of WPIC probands met criteria for PTSD than NYSPI probands (20.8%, $\chi^2 = 4.7$, $p = .03$). WPIC probands had higher mean ± SD BIS (impulsivity) scores (58.0 ± 19.3) than did NYSPI probands (mean ± SD BIS score = 50.2 ± 17.1, $t = -3.37$, $p = .0009$). WPIC probands had higher aggression scores (mean ± SD BGLHA score = 19.5 ± 6.0) than did NYSPI probands (mean ± SD BGLHA score = 17.4 ± 5.4, $t = -2.8$, $p = .005$). When site was therefore included as a covariable in the regression analyses, it was not found to be significant, and so analyses are reported without site as a covariable.

Multivariate analyses. Logistic and linear mixed-effects regression models tested for differences between offspring according to the abuse status of their proband, correcting for familial aggregation and controlling for offspring age and gender and for each type of abuse. We tested the models with and without the interaction between proband physical and sexual abuse. Logistic mixed-effects regression models were performed (SAS PROC GLIMMIX software; SAS Institute, Inc., Cary, N.C.) to determine the relationship between type of proband abuse and categorical response variables, such as offspring attempter status, and presence or absence of the following diagnoses: major depressive disorder, major depressive disorder or dysthymic disorder, PTSD, substance abuse disorder, and borderline personality disorder. Linear mixed-effects regression models (SAS PROC MIXED software) tested the relationship between proband abuse type and measures of offspring level of impulsivity, aggression, state of depression, levels of suicidal ideation, and hopelessness.

Univariate analyses. Chi-square analyses and analyses of variance were performed to compare the probands in the 4 study groups on demographic, diagnostic, and clinical variables. The subjects were compared on the basis of the 4 proband groups because we were interested in analyzing the differences between subjects with physical abuse only and those with sexual abuse only, and subjects with one type of abuse versus those with both types of abuse. Univariate analyses were performed to compare the offspring of the 4 proband groups on demographic, diagnostic, and clinical variables. To correct for family aggregation, for categorical variables, we used the generalized estimating equation method to estimate the population average difference among the offspring from the 4 proband groups (SAS PROC GENMOD software). For continuous variables, we use linear mixed model with the family as the random factor (SAS PROC MIXED software).

For the variables from the preceding analysis in which the null hypothesis of no differences was rejected, we performed 3 comparisons to assess whether there were significant differences between the offspring of probands with sexual and physical abuse only and between having one type of abuse and both types of abuse. We used the Bonferroni method to adjust the significance threshold for these tests to 0.017 (0.05/3).

Path analysis. Since offspring sexual abuse and impulsivity were most strongly associated with suicide attempt, we performed a path analysis testing the relationship between offspring attempt and the transmission of sexual abuse and impulsivity. We used a structural equation model with observed variables only for estimating path coefficients.[46] For categorical outcomes, such as offspring attempt, the model assumed that there is a latent continuous variable that approximates the probability of the outcome being true and used probit regression model to estimate a z score of the probability. We also used a cluster model to account for the family aggregation of offspring outcomes. Mplus software, version 3.12 (Muthén & Muthén, Los Angeles, Calif.), was used to conduct these analyses. The estimators were weighted least squares parameter estimates with mean- and variance-adjusted χ^2 test statistic (WLSMV).[47] The proband and offspring impulsivity scores were standardized as input into the model. The goodness-of-fit of the model was evaluated using Tucker-Lewis index (TLI), comparative fit index (CFI), and the root-mean-square error of approximation (RMSEA).[48]

RESULTS

Description of Probands

Probands were mostly female (231/271, 85%), with a mean ± SD age of 45 ± 9.8 years. Probands who reported

Table 1. Description of Probands With Major Depressive Disorder by Abuse Type (N = 271)[a]

Variable	No Abuse (N = 155)	Physical Abuse Only (N = 34)	Sexual Abuse Only (N = 47)	Both Physical and Sexual Abuse (N = 35)	Test Statistic	df	p Value
Demographic							
Age, y	46.8 ± 10.2	46.5 ± 10.8	41.8 ± 7.3	39.7 ± 6.9	F = 7.54	3,267	< .0001**
Race, white, N/N (%)	100/141 (70.9)	21/27 (77.8)	26/44 (59.1)	16/33 (48.5)	χ^2 = 8.70	3	.03
College education or higher, N/N (%)	62/151 (41.1)	9/34 (26.5)	6/46 (13.0)	5/35 (14.3)	χ^2 = 19.03	3	.0003
Income $40,000 or higher, N/N (%)	67/151 (44.4)	10/33 (30.3)	13/46 (28.3)	6/35 (17.1)	χ^2 = 11.60	3	.009
Attempter, N/N (%)	69/155 (44.5)	15/34 (44.1)	32/47 (68.1)	17/35 (48.6)	χ^2 = 8.40	3	.04
Sex, male, N/N (%)	29/155 (18.7)	8/34 (23.5)	1/47 (2.1)	2/35 (5.7)	χ^2 = 12.40	3	.007
Diagnostic, N/N (%)							
Posttraumatic stress disorder	26/155 (16.8)	12/34 (35.3)	22/47 (46.8)	18/35 (51.4)	χ^2 = 27.80	3	< .0001
Substance use disorder	61/155 (39.4)	18/34 (52.9)	26/47 (55.3)	21/35 (60.0)	χ^2 = 7.80	3	.051
Double depression[b]	124/155 (80.0)	23/34 (67.6)	38/47 (80.9)	31/35 (88.6)	χ^2 = 4.80	3	.19
Borderline personality disorder	18/154 (11.7)	5/34 (14.7)	8/47 (17.0)	10/35 (28.6)	χ^2 = 6.40	3	.09
Clinical measure							
Barratt Impulsivity Scale score	51.4 ± 18.4	58.8 ± 16.2	61.2 ± 20.6	58.7 ± 17.7	F = 4.40	3,252	.005*
BGLHA score	17.5 ± 5.4	20.2 ± 5.9	19.5 ± 5.5	21.8 ± 6.9	F = 6.52	3,251	.0003*
BDHI score	32.2 ± 13.2	38.0 ± 12.8	39.4 ± 12.2	39.0 ± 11.2	F = 5.77	3,252	.0008*
Beck Depression Inventory score	19.5 ± 11.8	24.2 ± 13.9	24.8 ± 12.1	24.2 ± 13.6	F = 3.36	3,251	.02*
Beck Hopelessness Scale score	9.6 ± 6.0	11.2 ± 5.6	10.8 ± 6.6	11.7 ± 6.7	F = 1.55	3,248	.20
HAM-D score	11.7 ± 8.0	10.1 ± 6.7	14.1 ± 4.2	14.0 ± 6.4	F = 2.81	3,263	.04
Suicide intent (most lethal) scale[c] score	15.8 ± 5.7	14.5 ± 6.1	15.0 ± 4.2	18.1 ± 5.1	F = 1.04	3,102	.38
Lethality of most lethal suicide attempt severe (≥ 4), N/N (%)	31/69 (44.9)	5/14 (35.7)	11/32 (34.4)	3/17 (17.6)	χ^2 = 4.60	3	.20
Age at first suicide attempt, y	32.5 ± 14.5	29.0 ± 12.8	29.6 ± 12.4	23.7 ± 9.6	F = 2.15	3,128	.10
Age at onset of physical abuse, y[d]	NA	7.0 ± 4.3	NA	7.3 ± 4.1	F = 0.09	1,51	.78
Age at onset of sexual abuse, y[e]	NA	NA	8.4 ± 4.0	7.3 ± 3.3	F = 1.84	1,72	.18
Age at onset of MDD, y	31.5 ± 12.7	25.0 ± 12.6	25.6 ± 11.3	18.6 ± 9.0	F = 12.32	3,255	< .0001

[a]Values expressed as mean ± SD unless otherwise noted.
[b]*Double depression* defined as major depressive disorder and dysthymic disorder.
[c]Refers to the Beck Suicide Intent Scale used to assess the most lethal attempt as measured by the Medical Damage Lethality Rating scale.
[d]N = 22 for physical abuse only; N = 30 for both physical and sexual abuse.
[e]N = 42 for sexual abuse only; N = 32 for both physical and sexual abuse.
*p < .05.
**p < .0001.
Abbreviations: BDHI = Buss-Durkee Hostility Inventory, BGLHA = Brown-Goodwin Lifetime History of Aggression, HAM-D = Hamilton Rating Scale for Depression, MDD = major depressive disorder, NA = not applicable.

childhood sexual abuse only or both physical and sexual abuse in childhood were younger, female, less likely to be white, less likely to be college educated, and less likely to have a household income over $40,000. They were also more likely to meet criteria for PTSD and substance use disorder; to have had higher scores on measures of lifetime impulsivity, aggression, hostility, and current depression severity at time of study entry; and to have made at least 1 lifetime suicide attempt (Table 1).

Description of Offspring

Of the 507 offspring, 276 (54%) were aged 10 to 17 years, and the remainder were 18 to 50 years old; 245 (48%) were female and 327 (64%) were white. Of the 448 offspring in whom abuse was assessed, 389 (87%) reported no history of childhood abuse, 21 (5%) reported childhood physical abuse only, 26 (6%) reported childhood sexual abuse only, and 11 (2%) reported both physical and sexual abuse. Thirty-seven offspring (8%) had made at least 1 lifetime suicide attempt, 117 (24%) had lifetime major depressive disorder, and 35 (7%) had PTSD.

Multivariate Predictor Models of Offspring Outcome Variables

Table 2 reports the results of the logistic and linear mixed-effects regression analyses. Analyses that included the interaction of physical and sexual abuse as a predictor variable were performed, but there were no interaction effects regarding the presence of both types of abuse and these outcome variables. Therefore, Table 2 reports only the analyses without interaction effects.

Offspring of the probands who reported a childhood history of sexual abuse (regardless of whether or not the probands were also physically abused) were 3.2 (95% CI = 1.4 to 7.3) times more likely than offspring of nonabused probands to have made at least 1 lifetime suicide attempt, controlling for offspring age and gender; were 2.9 (95% CI = 1.2 to 6.8) times more likely to report a personal history of sexual abuse; and were 3.8 (95% CI = 1.6 to 9.1) times more likely to meet criteria for PTSD. They also had an earlier age at onset of major depressive disorder. Offspring of probands who reported a history of physical abuse (regardless of whether or not the

Table 2. Offspring Outcome Variables by Proband Type of Abuse Controlling for Age and Gender

Variable	Estimate	SE	df	t Value	p Value	95% CI Lower	95% CI Upper	OR	OR Lower	OR Upper
Outcome (no. of probands/no. of offspring)										
Offspring attempt status (266/482)										
Proband physical abuse	0.40	0.42	195.90	0.96	.34	–0.42	1.23	1.50	0.65	3.43
Proband sexual abuse	1.17	0.42	255.50	2.80	.01	0.35	1.99	3.21	1.41	7.30
Offspring age	0.03	0.02	338.20	1.36	.17	–0.01	0.08	1.03	0.99	1.08
Offspring female	1.53	0.44	477.00	3.44	.00	0.66	2.40	4.61	1.93	11.03
Offspring MDD (267/487)										
Proband physical abuse	0.48	0.25	138.70	1.90	.06	–0.02	0.98	1.62	0.98	2.66
Proband sexual abuse	0.28	0.25	167.00	1.12	.26	–0.22	0.78	1.33	0.81	2.19
Offspring age	0.04	0.01	117.50	3.01	.00	0.01	0.06	1.04	1.01	1.06
Offspring female	0.58	0.22	482.00	2.63	.01	0.15	1.01	1.79	1.16	2.76
Offspring PTSD (267/487)										
Proband physical abuse	–0.21	0.48	306.90	–0.44	.66	–1.15	0.73	0.81	0.32	2.08
Proband sexual abuse	1.32	0.45	364.60	2.94	.00	0.44	2.21	3.75	1.55	9.10
Offspring age	0.05	0.02	401.10	1.99	.05	0.00	0.09	1.05	1.00	1.10
Offspring female	1.13	0.42	482.00	2.70	.01	0.31	1.95	3.09	1.36	7.03
Offspring physical abuse (250/447)										
Proband physical abuse	0.31	0.46	238.30	0.68	.50	–0.60	1.22	1.37	0.55	3.40
Proband sexual abuse	0.51	0.47	321.50	1.09	.28	–0.41	1.42	1.66	0.66	4.16
Offspring age	0.06	0.02	200.90	2.94	.00	0.02	0.10	1.06	1.02	1.11
Offspring female	–0.03	0.38	442.00	–0.07	.95	–0.78	0.73	0.97	0.46	2.07
Offspring sexual abuse (250/448)										
Proband physical abuse	0.14	0.44	191.90	0.31	.76	–0.74	1.01	1.15	0.48	2.75
Proband sexual abuse	1.06	0.43	254.20	2.45	.01	0.21	1.92	2.90	1.23	6.80
Offspring age	0.05	0.02	226.40	2.27	.02	0.01	0.09	1.05	1.01	1.10
Offspring female	1.22	0.41	443.00	2.99	.00	0.42	2.03	3.40	1.52	7.59
Offspring impulsivity, standardized (271/455)										
Proband physical abuse	0.14	0.11	230.00	1.28	.20	–0.07	0.35	…	…	…
Proband sexual abuse	0.28	0.10	235.00	2.71	.01	0.08	0.49	…	…	…
Offspring age	–0.01	0.01	252.00	–2.75	.01	–0.03	0.00	…	…	…
Offspring female	–0.31	0.08	445.00	–3.65	.00	–0.48	–0.14	…	…	…
Offspring aggression, BGLHA (271/453)										
Proband physical abuse	2.13	0.74	223.00	2.87	.00	0.67	3.59	…	…	…
Proband sexual abuse	0.95	0.71	227.00	1.33	.18	–0.46	2.36	…	…	…
Offspring age	0.04	0.04	269.00	0.97	.33	–0.04	0.11	…	…	…
Offspring female	–2.53	0.55	428.00	–4.62	< .0001	–3.60	–1.45	…	…	…
Offspring hopelessness (271/457)										
Proband physical abuse	0.01	0.12	209.00	0.06	.95	–0.23	0.24	…	…	…
Proband sexual abuse	0.17	0.12	216.00	1.47	.14	–0.06	0.40	…	…	…
Offspring age	0.00	0.01	237.00	–0.53	.59	–0.01	0.01	…	…	…
Offspring female	0.09	0.09	446.00	0.91	.36	–0.10	0.27	…	…	
Effect (no. of offspring)										
Offspring suicidal ideation (455)										
Proband sexual abuse	–0.39	0.73	224	–0.45	.66	–1.77	1.12	0.72	0.17	3.06
Proband physical abuse	0.64	0.67	146	0.94	.35	–0.70	1.96	1.89	0.50	7.12
Offspring age	–0.004	0.04	199	–0.12	.90	–0.08	0.07	1.00	0.93	1.07
Offspring female	1.05	0.69	450	1.53	.13	–0.30	2.41	2.87	0.74	11.09
Offspring self-report depression, BDI and CDI (431)										
Proband sexual abuse	0.10	0.09	198	1.12	.27	–0.08	0.28	…	…	…
Proband physical abuse	–0.01	0.09	194	–0.16	.87	–0.20	0.17	…	…	…
Offspring age	–0.02	0.01	199	–3.54	.01	–0.03	–0.01	…	…	…
Offspring female	0.19	0.08	424	2.56	.01	0.05	0.34	…	…	…
Offspring MDE age at onset (73)[a]										
Proband sexual abuse	–5.07	1.51	69	–2.16	.03	–9.77	–0.38	…	…	…
Proband physical abuse	0.72	2.17	69	0.33	.74	–3.62	5.05	…	…	…
Offspring female	–2.05	1.79	69	–1.14	.26	–5.63	1.53	…	…	…

[a]Without offspring age as covariate—a more valid model because age at onset should be independent of offspring age.
Abbreviations: BGLHA = Brown-Goodwin Lifetime History of Aggression, CDI = Children's Depression Inventory, MDD = major depressive disorder, MDE = major depressive episode, PTSD = posttraumatic stress disorder.
Symbol: … = not applicable.

Table 3. Comparison of Offspring by Proband Reported Abuse History (N = 507)[a]

Variable	No Abuse (N = 294)	Physical Abuse Only (N = 63)	Sexual Abuse Only (N = 89)	Both Physical and Sexual Abuse (N = 61)	Test Statistic	df	p Value
Demographic							
Age, y	21.2 ± 9.8	19.5 ± 8.6	16.3 ± 4.5	17.1 ± 5.2	F = 4.53	3,268	.004
Race, white, N/N (%)	205/265 (77.4)	41/54 (75.9)	49/85 (57.6)	32/56 (57.1)	χ^2 = 4.53	3	.21
Attempter, N/N (%)	13/276 (4.7)	4/62 (6.5)	10/87 (11.5)	10/57 (17.5)	χ^2 = 6.66	3	.08
Sex, male, N/N (%)	153/294 (52.0)	33/63 (52.4)	46/89 (51.7)	30/61 (49.2)	χ^2 = 0.28	3	.96
Diagnostic, N/N (%)							
MDD	63/279 (22.6)	15/62 (24.2)	17/87 (19.5)	22/59 (37.3)	χ^2 = 5.09	3	.17
Bipolar disorder	9/279 (3.2)	7/62 (11.3)	2/87 (2.3)	4/59 (6.8)	χ^2 = 5.33	3	.15
PTSD	16/279 (5.7)	1/62 (1.6)	10/87 (11.5)	8/59 (13.6)	χ^2 = 9.30	3	.03
Substance use disorder	65/279 (23.3)	15/62 (24.2)	16/87 (18.4)	11/59 (18.6)	χ^2 = 1.42	3	.70
Dysthymic disorder	10/279 (3.6)	4/62 (6.5)	6/87 (6.9)	4/59 (6.8)	χ^2 = 2.19	3	.53
Any anxiety disorder	50/279 (17.9)	13/62 (21.0)	23/87 (26.4)	24/59 (40.7)	χ^2 = 9.18	3	.03
ADHD	23/131 (17.6)	9/36 (25.0)	7/60 (11.7)	12/42 (28.6)	χ^2 = 5.01	3	.17
Borderline personality disorder	6/156 (3.8)	3/29 (10.3)	1/29 (3.4)	0/19 (0)	…	…	…
Clinical measure							
Physical abuse, N/N (%)[b]	16/261 (6.1)	5/48 (10.4)	7/85 (8.2)	4/53 (7.5)	χ^2 = 0.94	3	.82
Sexual abuse, N/N (%)[c]	17/262 (6.5)	2/48 (4.2)	9/85 (10.6)	9/53 (17.0)	χ^2 = 4.18	3	.24
Impulsivity z score	–0.3 ± 0.9	–0.2 ± 0.8	0.1 ± 0.9	0.2 ± 1.1	F = 4.99	3,242	.002
Aggression score	16.7 ± 5.8	18.3 ± 6.8	17.2 ± 5.9	19.8 ± 6.9	F = 3.96	3,225	.009
BDHI combined z score	–0.2 ± 0.9	–0.9 ± 0.8	0.1 ± 0.6	–0.1 ± 0.8	F = 1.35	3,249	.26
BDI and CDI z score	–0.5 ± 0.8	–0.4 ± 0.9	–0.2 ± 0.9	–0.3 ± 0.8	F = 1.57	3,200	.20
BHS combined z score	–0.1 ± 0.1	0.1 ± 1.0	0.2 ± 1.2	0.1 ± 1.1	F = 1.12	3,214	.34
HAM-D score	3.0 ± 4.3	3.2 ± 5.9	3.1 ± 4.3	4.2 ± 4.1	F = 0.69	3,168	.56
Depression from interview (HAM-D and CDRS) z score	–0.5 ± 0.6	–0.4 ± 0.8	–0.4 ± 0.6	–0.3 ± 0.5	F = 1.52	3,260	.21
Age at first suicide attempt, y	16.4 ± 4.9	11.8 ± 2.8	14.8 ± 2.6	15.9 ± 5.6	F = 1.21	3,33	.32
Age at onset of MDD, y	19.3 ± 7.5	21.2 ± 9.4	15.6 ± 1.9	13.5 ± 6.3	F = 1.89	3,69	.14

[a]Values expressed as mean ± SD unless otherwise noted.
[b]Offspring total N = 447.
[c]Offspring total N = 448.
Abbreviations: ADHD = attention-deficit/hyperactivity disorder, BDHI = Buss-Durkee Hostility Inventory, BDI = Beck Depression Inventory, BHS = Beck Hopelessness Scale, CDI = Children's Depression Inventory, CDRS = Children's Depression Rating Scale, HAM-D = Hamilton Rating Scale for Depression, MDD = major depressive disorder, PTSD = posttraumatic stress disorder.
Symbol: … = not available.

probands were also sexually abused) also had higher lifetime aggression scores, controlling for offspring age and gender. There were no differences between groups regarding diagnosis of major depressive episode or on measures of depressive symptomatology.

Comparison of Offspring by Type of Abuse Reportedly Experienced by Their Parent Proband

Table 3 reports a univariate comparison of the 4 offspring groups on demographic, diagnostic, and clinical variables, controlling for intrafamilial aggregation. Offspring of probands who reported either sexual abuse alone or both physical and sexual abuse were younger, more likely to have an anxiety disorder—and PTSD in particular—and had higher z scores on impulsivity than offspring of nonabused or physically abused probands. Offspring of probands who reported physical abuse only or both physical and sexual abuse had higher BGLHA scale scores than did offspring of probands with no abuse or sexual abuse only. In this analysis, there was no significant difference in suicide attempt status between offspring of probands with and without sexual abuse.

Table 4 reports the results of the multiple comparison analyses. Offspring whose probands reported both physical and sexual abuse had significantly higher BGLHA (aggression) scores than did offspring whose probands reported sexual abuse only, after adjusting for multiple comparison. No other significant results were found after adjusting for multiple comparison.

Offspring PTSD

Since sexual abuse in the proband was related to sexual abuse and a diagnosis of PTSD in offspring, we reviewed the cases of PTSD in the offspring to see whether the PTSD was due to sexual abuse experienced in childhood. Thirty-five offspring met criteria for PTSD. Of those, 16 (46%) reported sexual abuse before the age of 18 years. The perpetrators of sexual abuse were fathers, brothers, stepfathers, cousins, uncles, or non–family members. Twelve of these cases were related to having experienced childhood physical abuse (8 of these cases overlapped). The perpetrators of physical abuse were fathers, mothers, brothers, stepfathers, and boyfriends. The other 12 cases of PTSD involved

Table 4. Multiple Comparisons by Proband Abuse Type[a]

Outcome	Estimate[b]	Statistic	df	p Value
Offspring age				
Sexual only vs physical only	–2.45	t = –1.35	267	.18
Both vs sexual only	0.36	t = 0.20	270	.84
Both vs physical only	–2.10	t = –1.07	270	.29
Offspring impulsivity (standardized)				
Sexual only vs physical only	0.19	t = 1.12	230	.26
Both vs sexual only	0.20	t = 1.15	256	.25
Both vs physical only	0.39	t = 2.10	251	.04
Offspring BGLHA score				
Sexual only vs physical only	–1.12	t = –0.97	219	.34
Both vs sexual only	2.97	t = 2.56	234	.0112[c]
Both vs physical only	1.85	t = 1.47	231	.14
Offspring PTSD				
Sexual only vs physical only	7.72	$\chi^2 = 3.66$	1	.06
Both vs sexual only	1.26	$\chi^2 = 0.17$	1	.67
Both vs physical only	9.72	$\chi^2 = 4.45$	1	.04
Offspring anxiety disorder				
Sexual only vs physical only	1.24	$\chi^2 = 0.27$	1	.60
Both vs sexual only	1.88	$\chi^2 = 2.66$	1	.10
Both vs physical only	2.33	$\chi^2 = 4.06$	1	.04

[a]Only 3 comparisons; based on the Bonferroni method, p value threshold: .05/3 = .017.
[b]Estimated difference in the scale of the outcome variable for age, impulsivity, and BGLHA score; estimated odds ratio for PTSD and anxiety disorder.
[c]Comparison remained significant after adjusting for multiple comparison.
Abbreviations: BGLHA = Brown-Goodwin Lifetime History of Aggression, PTSD = posttraumatic stress disorder.

witnessing violence within the family and/or in their neighborhood.

Other Parameters of Childhood Abuse History

Perpetrators of abuse in probands. A subset (55/69, 79.7%) of the probands reported the identity of the perpetrator of the physical abuse. These 55 probands report 66 perpetrators, since some reported multiple perpetrators. Fifty-five of the 66 physical abuse perpetrators (83.3%) were in-home primary caretakers, a noncustodial parent, another adult living in the home, or a sibling. Seventy-five of 82 probands (91.5%) reporting sexual abuse report 102 perpetrators. Twenty of the 102 perpetrators (19.6%) were siblings or stepsiblings. Eighteen of the 102 perpetrators (17.6%) were reported to be the home primary caretaker. Three of the 102 (2.9%) were an in-home adult who was not the primary caretaker. A majority, 61 of 102 (59.8%), were reported to be adults outside the home (acquaintances, babysitters, neighbors, teachers, clergy, or day care workers).

Perpetrators of abuse in offspring. Twenty-four of 32 physically abused offspring reported 27 perpetrators. A majority of the perpetrators of physical abuse (20/27, 74.1%) were the primary caretaker. Four of the 27 (14.8%) were other in-home adults or siblings, and only 2 of the 27 (7.4%) were from outside the home. Twenty-eight of 37 sexually abused offspring reported 35 perpetrators with the majority being an adult outside the home (21/35, 60.0%). Seven of the 35 (20.0%) were the primary caretaker and 7 (20.0%) were another adult or sibling within the home.

The role of sexually abused probands as perpetrators of sexual abuse in offspring. Fourteen offspring of sexually abused probands reported sexual abuse themselves. These 14 offspring report 21 perpetrators. Only 2 of the 21 (9.5%) were the sexually abused parent proband primary caregiver. Among the rest, 2 perpetrators (9.5%) were a non–primary caregiver parent, 4 (19.0%) were siblings, and 13 (61.9%) were from outside the home.

Relationship of offspring perpetrator of sexual abuse to attempt status in offspring. Perpetrators were categorized by whether they were *in-home* or *out-of-home*. In a mixed logistic regression analysis, 3 of 15 (20.0%) of the offspring with out-of-home perpetrators had made at least 1 suicide attempt, while 6 of 12 (50.0%) of the offspring with in-home perpetrators had made at least 1 lifetime suicide attempt, but these differences were not statistically significant ($\chi^2 = 0.008$, p = .93), possibly due to the small sample size.

Relationship of proband perpetrator of sexual abuse to attempt status in offspring. In a mixed regression analysis, 11 of 91 (12.1%) of the offspring with a proband with an out-of-home perpetrator of sexual abuse had at least 1 lifetime attempt, while 7 of 56 (12.5%) of offspring with a proband with an in-home perpetrator of sexual abuse had at least 1 lifetime suicide attempt. The difference was not statistically significant (mixed logistic regression [PROC GLIMMIX] p value = .89).

Severity of abuse. Severity of abuse was determined by the score on the CARE. Severity of sexual abuse was distributed bimodally— either there was no abuse reported or the abuse was severe. The severity of physical abuse was

Table 5. Proband Physical Abuse and Offspring Aggression and Impulsivity

Variable	Estimate	SE	df	t Value	p Value	95% CI
Aggression						
Proband maximum severity	0.37	0.12	232	3.20	.002	0.14 to 0.60
Female	–2.62	0.54	428	–4.84	< .0001	–3.6863 to –1.5562
Age (centered)	0.15	0.05	357	3.01	.003	0.053 to 0.25
Age*age[a] (centered)	–0.011	0.003	382	–3.63	.0003	–0.017 to –0.005
Impulsivity						
Proband maximum severity	0.05	0.02	231	2.60	.01	0.01 to 0.08
Female	–0.26	0.09	399	–3.90	< .004	–0.44 to –0.09
Age (centered)	–0.02	0.006	227	0.40	< .0001	–0.03 to –0.009

[a]*Age*age* refers to the square term of age.

more normally distributed. Since offspring aggression was significantly related to proband physical abuse, we performed post hoc analyses comparing the severity of the proband's physical abuse with the levels of offspring aggression and impulsivity. Severity of physical abuse in the proband correlated with higher aggression and impulsivity scores in the offspring. For each level of physical abuse severity (range, 5–9), the BGLHA score increased by 0.37 (BGLHA score range, 7–38; mean ± SD = 17.4 ± 6.1). For each level of physical abuse severity, the BIS standardized z score increased by 0.05 (Table 5).

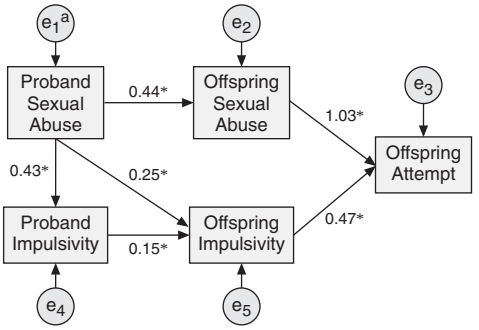
Path Analysis

We tested for the direct and indirect effects of proband sexual abuse and impulsivity on offspring sexual abuse, impulsivity, and suicide attempts. We started from the full model and successively deleted the paths that were not significant until all paths in the model were significant. This model is shown in Figure 1. The path model fits well with the data (CFI = 1.00, TLI = 1.07, and RMSEA = 0.00). Offspring sexual abuse and offspring impulsivity were both found to mediate between proband sexual abuse and offspring suicide attempt status. The probability of making a suicide attempt for offspring who have sexual abuse is 8.4% versus 0.8% for those do not have sexual abuse ($z = 3.475$, $p < .001$). The indirect effect from proband sexual abuse to offspring attempt through offspring sexual abuse is significant ($z = 2.32$, $p = .02$) The model explains 57% of the variance of offspring attempt (Figure 1).

Since the model is estimated using the WLSMV method, instead of the maximum likelihood method, χ^2 likelihood ratio test cannot be applied to model comparison. We used the difference test for the WLSMV estimation method supplied by Mplus.[49]

We compared the model in Figure 1 with a model with an additional path from offspring sexual abuse to offspring impulsivity. In this second model, the probability of making a suicide attempt for offspring who report sexual abuse is 8.2% versus 0.9% for those who do not report sexual abuse ($z = 3.83$, $p < .001$). The indirect effect of proband sexual abuse on offspring attempt operating through offspring sexual abuse is significant ($z = 2.38$, $p = .02$). The

Figure 1. Path Analysis With Standardized Coefficients



[a]e_i are error terms.
*$p < .05$.

model explains 54% of the variance of offspring attempt. The path model fits well with data (CFI = 1.00, TLI = 1.08, and RMSEA = 0.00).

Thus, there were no significant differences between the 2 models in the overall model fit ($\chi^2 = 0.806$, df = 1, $p = .37$). The indirect effect of proband sexual abuse on offspring attempt remains significant in the second model ($z = 2.38$, $p = .02$). However, the indirect effect of proband impulsivity on offspring attempt became insignificant ($z = 1.874$, $p = .06$).

Therefore, the data contain very strong evidence for the association between proband sexual abuse and offspring attempt, while less strong evidence for the association between proband impulsivity and offspring attempt.

DISCUSSION

This study was undertaken to further explore the familial transmission of risk for suicidal behavior by examining the relationship between reported childhood abuse in biological parents diagnosed with major depressive disorder and risk for suicidal behavior in their offspring. The main findings are that reported childhood sexual abuse, but not physical abuse, in parent probands is related to suicidality and other risk factors for suicide attempt both in the probands themselves and in their biological off-

spring. More specifically, reported childhood sexual abuse in probands is correlated with greater likelihood of the proband having made at least 1 lifetime suicide attempt and having comorbid PTSD and dysthymic disorder; more severe lifetime impulsivity, hostility, and aggression; and earlier age at onset of major depressive disorder compared with parent probands with no sexual abuse history. Offspring of sexually abused probands were significantly more likely to have made at least 1 lifetime suicide attempt, to have been sexually abused themselves, to have a diagnosis of PTSD, and to have higher levels of impulsivity. They were not more likely to have a diagnosis of major depressive disorder or report depressive symptomatology, but those who did have major depressive disorder had a significantly earlier age at onset of their first depressive episode. Sexual abuse, however, was not directly transmitted from proband to offspring—perpetrators of offspring sexual abuse were more likely to be from outside the home. In path analysis, offspring sexual abuse and offspring impulsivity were both found to mediate the relationship between proband sexual abuse and offspring suicide attempt. The relationship between the environment (sexual abuse) and the trait (impulsivity) variable was additive, not interactive. Thus, the path from proband sexual abuse to offspring sexual abuse and offspring attempt was distinct from the path from proband sexual abuse and proband impulsivity to offspring impulsivity and offspring suicide attempt. This indicates that both environmental and trait variables are familially transmitted and increase the risk for offspring suicidal behavior. These results replicate and extend our previous findings[5] in a larger sample in which additional parameters of abuse were investigated.

In our study, there was a specific effect of sexual abuse, as compared to physical abuse, both on the offspring likelihood of making a lifetime suicide attempt and on the familial transmission of suicidal behavior to offspring. While some studies have found a relationship between physical abuse and suicidal behavior, the majority of studies show a much greater effect with a history of sexual rather than physical abuse,[26,27,50–52] and some report a greater risk for suicide attempts in those reporting more than 1 type of abuse.[53] When controlling for offspring age and gender, offspring of sexually abused probands had more severe lifetime impulsivity than did offspring of nonabused or physically abused probands. Only offspring of physically abused probands had more severe lifetime aggression, but they were not more likely to have made a suicide attempt, nor were they more impulsive. Thus, offspring impulsivity was associated with having a sexually abused parent, and offspring aggression was associated with having a physically abused parent. Aggression has been reported to be a familially transmitted trait associated with suicidal behavior,[12] and we have also previously reported a relationship between childhood abuse, impulsivity, and suicidal behavior in borderline personality disorder.[19] It is unclear, given the well-documented relationship between impulsive aggression and suicidal behavior, why impulsivity alone, and not aggression, was related to the transmission of suicidal behavior in this study. Perhaps covariables such as age, gender, and type of abuse mediate this association. Further research is necessary to investigate what may be a possible interaction between type of abuse, type of personality trait, and the familial transmission of traits associated with suicidal behavior. It is important to emphasize that in this study, offspring of sexually abused probands were more likely to be sexually abused themselves, but that the majority of reported perpetrators of sexual abuse were extrafamilial. Thus, the transmission of sexual abuse from proband to offspring was not direct. Indirect effects that may result in familial transmission may be traits that increase the chances of sexual abuse such as parental values, religious values, impulsive traits and discipline,[54,55] and offspring traits resulting in sexually suggestive behavior.

In contrast, physical abuse was associated with in-home perpetrators. One study[56] examined the possible differences in family environments related to both intrafamilial and extrafamilial sexual abuse, but found considerable similarities in the family of origin environments of female adult survivors of sexual abuse, regardless of type of perpetrator. Little is known regarding differences in perpetrators in survivors of physical and sexual abuse. It is possible that in our current study, the sexually abused offspring were less forthcoming about the intrafamilial perpetrators of sexual abuse due to shame or fear of exposure.

Sexual abuse may be more specifically related to suicidal behavior because it is more closely associated with feelings of shame[57] or internal attributions of blame,[58–60] which may increase vulnerability to internalizing behaviors such as self-harm and suicidality, and to PTSD. For instance, female survivors of sexual abuse who reported abuse by an immediate family member before 10 years of age recalled making internal attributions of blame when they were children, which were predictive of a history of suicide attempts.[61] A longitudinal study[62] found that high levels of shame persisted among sexually abused youth 6 years after the time of discovery, which may contribute to maintenance of PTSD symptoms. Less is known regarding the attributions related to physical abuse.[63]

In addition, the familial dynamics surrounding sexual in contrast to physical abuse may contribute to risk for suicide. For instance, emotional and psychological abuse appear more closely related to sexual than to physical abuse.[64,65] Also, a history of childhood sexual and emotional abuse was highly correlated with intimate partner violence, PTSD, and suicide attempts among a community sample of women.[64] There is evidence that mothers who were sexually abused in childhood have higher rates

of permissive parenting behaviors that may endanger their offspring in terms of sexual abuse,[54] have difficulty establishing clear generational boundaries, and use harsh physical discipline.[66]

Children of sexually abused mothers may be exposed to other forms of trauma, such as witnessing domestic violence. For example, in our study, the offspring of sexually abused probands were more likely to have PTSD that was not just related to having experienced abuse themselves. In reviewing the traumas that led to their PTSD diagnosis, a number of patterns emerged. The offspring who did report abuse were often victims of their father's, or stepfather's, physical or sexual abuse, so that the sexually abused proband mother was not the perpetrator, but often chose an abusive partner.[64] Offspring of sexually abused probands also reported other types of trauma, such as witnessing of violence toward family members both in the home and in their neighborhoods. PTSD in the offspring of sexually abused probands may have been related to their experiences being raised by traumatized sexually abused probands with severe comorbid psychopathology, particularly related to substance use. In addition, earlier onset of first major depressive episode in the offspring was correlated with sexual abuse in the proband. Another study[54] found that childhood sexual abuse in a mother was related to maternal depression and partner violence.

In this study, proband sexual abuse, and sexual abuse in the offspring, was related to suicide attempt status but not to risk factors for suicidality such as hopelessness or suicidal ideation. It is possible that impulsivity as a mediator between parental abuse and offspring suicidality represents a pathway for familial transmission of suicide risk that is distinct from that of hopelessness and suicidal ideation. Indeed, hopelessness and impulsivity were found to independently contribute to suicide risk in individuals with borderline personality disorder.[67]

Strengths of this study are that it is cross-generational, that it controls for depression in the proband, and that probands and offspring were interviewed in person by independent interviewers as part of the prospective design. The results suggest that reported sexual abuse in the parent increases risk of suicide attempt in the child through transmission of abuse and impulsivity and that physical abuse in the parent increases aggression in the child. We relied on reported history of abuse, but evidence provided by the present study as well as others[68,69] suggests that abuse is underreported. In this study, there was high agreement between 2 retrospective interview methods in the report of both physical and sexual abuse, and discrepancies between the 2 methods were often due to underreporting.

The cross-sectional design of this study limited the ability to explore interactional variables that might shed light on mediation. Our results indicate the need for future longitudinal research regarding the effects of childhood abuse on the familial transmission of suicidal behavior. In prospective studies,[70] subsequent suicidal behavior has been found in the same individuals who were identified in childhood to have been sexually abused,[71] and children of mothers with major depressive disorder were more likely to report suicidal ideation.

Future longitudinal research should look more closely at the temporal relationship between appearance of major depressive disorder and PTSD relative to childhood abuse, as well as onset of suicidal behavior. Familial factors surrounding different types of childhood trauma and their relationship to the development of suicidal behaviors should be identified and investigated. The role of shame, feelings of betrayal, self-hate, attachment styles, and attributions related to various forms of abuse should be examined. Understanding how other factors known to mediate between childhood abuse and depression/suicidal behavior (such as attribution of blame and parenting styles) may aid in the identification of interventions to prevent morbidity and mortality.

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