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The Relationship Between Lifetime Abuse and Suicidal Ideation in a Sample of Injection Drug Users†

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Abstract

This study examined the relationship between lifetime abuse and suicidal ideation in a sample of 245 injection drug users (IDUs) who attended the Baltimore Needle Exchange Program and received a referral for opiate agonist therapy. Data were obtained from baseline interviews and HIV antibody tests. The sample mean age was 42.2 (SD = 8.1); 77% were African American; 69% were male. Overall, 27% reported thoughts of suicide in the last six months, and lifetime emotional, physical and sexual abuse was reported by 17%, 12% and 10%, respectively. In bivariate analyses, recent suicidal ideation was associated with emotional (odds ratio [OR] = 3.2; $p = 0.001$), physical (OR = 2.5; $p = 0.026$), and sexual abuse (OR = 5.0; $p < 0.001$). In multiple logistic regression models controlling for HIV status and Center for Epidemiological Studies Depression (CES-D) score, individuals who experienced emotional abuse were more than twice as likely to report recent suicidal ideation (adjusted odds ratio [AOR] = 2.6; $p = 0.011$); those who experienced sexual abuse were four times more likely to report suicidal ideation (AOR = 4.0; $p = 0.004$). These findings suggest that emotional and sexual abuse might be risk factors for suicidality among IDUs and also might suggest that suicide prevention should be an integral part of drug treatment for treatment-seeking IDUs.

Keywords

emotional abuse; injection drug use; physical abuse; sexual abuse; suicide ideation

Suicide is a potentially preventable public health problem. The mortality trend for suicide has been on a gradual increase since 1992. In 2002, suicide was the eleventh leading cause of death

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in the United States (Kochanek et al. 2004), and approximately 11 out of every 100,000 persons died as a result of suicide. Based on 2000 estimates, suicide deaths outnumbered homicide deaths by five to three (Miniño et al. as cited in NIMH 2003).

Alcohol and drug use, abuse, and dependence have been identified as risk factors for suicidal thoughts and behaviors (Borges, Walters & Kessler 2000; Moscicki 1997). Specifically, heroin (Darke & Ross 2002; Borges, Walters & Kessler 2000) and alcohol (Conner et al. 2003; Borges, Walters & Kessler 2000) have been found to increase the risk of suicidal thoughts and behaviors. Prior studies suggest higher rates of suicidal behavior among injection drug users (IDUs) compared to other drug users (Frischer et al. 1993; Dinwiddie, Reich & Cloninger 1992). In a study of injection drug users, Frischer and colleagues (1993) found that 35% of deaths among IDUs were attributed to suicide. Dinwiddie and colleagues (1992) found IDUs to be eight times more likely to attempt suicide compared with nondrug users.

Suicidal behaviors often occur along a continuum progressing from thoughts (i.e., ideation), plans, attempts, and completed suicides (Crosby, Cheltenham & Sacks 1999). The incidence of suicide gestures and attempts is an estimated 10 to 20 times higher than for completed suicides (Diekstra & Gulbinat 1993). Given that suicidal ideation has been shown to be a predictor of future suicide attempts and completion (Mino, Bousquet & Broers 1999), identifying correlates for suicidal ideation is an important component of suicide prevention.

Abuse, particularly physical and sexual abuse, has been identified as a predictor of suicidal behavior in nondrug-using, as well as drug-using, populations (NIMH 2003). In drug-using populations, a limited number of studies have found abuse to be associated with suicidal ideation (Bartholomew et al. 2002) and attempts (Braitstein et al. 2003; Roy 2003, 2002, 2001a, b). Roy (2002, 2001a, b) found childhood abuse (emotional, physical, and sexual) to be associated with suicide attempts among cocaine and opiate-dependent patients. Braitstein and colleagues (2003) found male and female IDUs with a lifetime history of sexual violence were more likely to have attempted suicide. In a study of women entering methadone treatment, Bartholomew and colleagues (2002) found a lifetime history of sexual abuse to be predictive of suicidal thoughts.

The purpose of this study was to examine the relationship between lifetime emotional, physical, and sexual abuse and recent suicidal ideation among male and female injection drug users attending a needle exchange program (NEP). Specifically, the authors tested hypotheses that each form of abuse is independently associated with suicidal ideation. In addition, included in this study were covariates suspected to be associated with suicidal ideation based on findings from prior studies (e.g., prior treatment, history of overdose, HIV status, depression, psychiatric disorder, and medical status). The results from this study have important implications with respect to the need for NEPs and other drug treatment programs to target IDUs for suicide screening and prevention.

METHODS

Study Design and Population

The purpose of the TRI study (Cornelius et al. 2006; Strathdee et al. 2006) was to evaluate the impact of case management services on drug treatment entry, retention, and outcomes (i.e., HIV seroincidence, injection drug use, and injection-related health seeking behaviors) among IDUs participating in the Baltimore NEP. During the study period, the NEP provided IDUs with referrals into subsidized opiate agonist treatment programs (e.g., methadone maintenance or LAAM). More detailed information on the Baltimore NEP has been published elsewhere (Vlahov et al. 1997).

The TRI was a prospective study for which data were collected during a baseline assessment and multiple follow-up periods. Participants were IDUs attending one of 13 mobile van sites of the NEP who requested and received a referral for methadone maintenance therapy (MMT) or LAAM (levo-alpha-acetyl-methadol) and were randomized to receive either strengths-based case management (intervention condition) or a standard referral (control condition). The protocol for this study was reviewed and approved by the Johns Hopkins University Bloomberg School of Public Health Institutional Review Board (IRB) for protection of human subjects in research.

Data Collection and Measures

The data for this study were obtained exclusively from baseline data recorded by study staff during face-to-face interviews. During the baseline interview, participants answered questions on their demographics, social environment, substance use, mental health history, and other questions. In addition, they completed the Addiction Severity Index (ASI), a semistructured interview designed to assess problem areas in substance-abusing patients (McLellan et al. 1992).

The response variable of interest in this study was suicidal ideation. Consistent with the definition posited by O'Carroll and colleagues (1996), suicidal ideation was defined as having had suicide thoughts in the last six months, based on a question from the baseline questionnaire that asked, "During the last six months have you ever thought of taking your own life, even if you would not actually do it?"

The covariates of central interest were defined as experiencing emotional, physical, and sexual abuse in one's lifetime. These measures were assessed at baseline using participants' responses to three questions in the Family/Social Relationships section of the Addiction Severity Index (ASI), which followed a question that asked respondents if they have had significant periods in which they had experienced serious problems getting along with immediate and significant family members (mother, father, brothers/sisters, children, other significant family), sexual partner/spouse, close friends, neighbors, or coworkers. The three questions used to assess abuse were: "Did any of these people abuse you: 1) emotionally (make you feel bad through harsh words), 2) physically (cause you physical harm), and 3) sexually (force sexual advances or sexual acts)?" The questions were asked with respect to experiences in the past 30 days and in one's life. For this study, we used questions specific to lifetime experience. More specifically, the questions used in this study assessed emotional, physical, and sexual abuse perpetrated by family members or individuals in one's social network in one's lifetime.

Additional covariates of interest included sociodemographic characteristics (age, gender, race, marital status, income, education level) that were obtained from the baseline questionnaire. Based on findings from prior studies, we included the following additional constructs thought to be important in influencing suicidal ideation and that might function as confounding variables: prior substance abuse treatment experience, history of overdose, HIV status, and symptoms of depression as measured through the Centers for Epidemiologic Studies Depression (CES-D) scale (Radloff 1977). Given that drug intoxication or withdrawal can mimic symptoms of depression, a cut off score of 23 was used to differentiate between individuals with severe symptoms versus those with no-to-mild symptoms (Perdue et al. 2003). HIV testing was conducted during the baseline visit using the OraQuick Rapid HIV-1 Antibody Test (OraSure Technologies, Inc., Bethlehem Pennsylvania). Pre- and post-test HIV counseling was provided. Also included in the analyses were composite scores for the ASI drug/alcohol use, psychiatric status, and medical status subscales, also thought to be important covariates based on existing literature.

Analysis

Frequency estimations, cross tabulations, and other exploratory data analyses were used to obtain a profile of the study sample and the underlying distributions of each response variable and covariate of interest. Bivariate analyses were conducted to estimate the strength of the association between suicidal thoughts in the last six months and each key covariate of interest. In subsequent analyses, multiple logistic regression analyses involved two steps: fitting terms to control for covariates suspected to distort the associations of interest, and an exploration of subgroup variation in the strength of the observed associations. To test for subgroup variation, we tested interaction terms for gender and each type of abuse as well as HIV status and each type of abuse.

Odds ratios are presented as estimates of the strength of the associations studied. We also present the 95% confidence intervals and p -values. Statistical significance was set at $p < 0.10$ for the bivariate statistical analyses; those variables with a $p < 0.10$ were included in the multivariate models. For the multivariate analyses, statistical significance was set at $p < 0.05$; only variables with a $p < 0.05$ were retained in the final multivariate models. Because the measures for this study were collected at baseline prior to intervention group randomization, there was no need to adjust for intervention or control condition assignment.

FINDINGS

The sample for this study consisted of 245 IDUs attending the Baltimore NEP from January 2002 to January 2004. Most (95%) of the sample were residents of Baltimore City. The study sample, treatment-seeking IDUs attending the Baltimore NEP and participating in the TRI, were compared with IDUs registered with the Baltimore NEP during the study period ($n = 2,796$). Compared with Baltimore NEP enrollees overall, treatment-seeking IDUs in the study sample were less likely to be employed (14% versus 23%, $p = 0.006$) and more likely to be African American (77% versus 53%, $p < 0.001$) (results not shown). Otherwise the two groups were similar.

Table 1 presents descriptive statistics for the study sample. The mean age of the sample was 42.2 years old (standard deviation [SD] = 8.1). Males made up about 69% of the study sample, 77% were African American, and approximately 19% were HIV positive. About 27% of the sample reported having suicidal thoughts in the last six months, 17% reported that they had experienced lifetime emotional abuse, 12% reported lifetime physical abuse, and 10% reported lifetime sexual abuse.

Frequencies for selected study variables of interest stratified by suicidal ideation in the last six months as well as estimates for the unadjusted bivariate associations between each covariate and suicidal ideation are presented in Table 2. In bivariate models, there were statistically significant relationships between suicidal ideation in the last six months and having experienced lifetime emotional, physical, and sexual abuse ($p < 0.05$). There were also statistically significant relationships between suicidal ideation and gender, race, HIV status, having had prior drug treatment, ever having had an overdose, depressive symptoms, ASI psychiatric status composite score, and ASI medical status composite score ($p < 0.10$).

As shown in Table 2, individuals who reported ever being emotionally abused were over three times more likely to have suicidal thoughts in the last six months (Odds Ratio [OR] = 3.24; 95% Confidence Interval [CI] = 1.6, 6.5; $p = 0.001$). Respondents who experienced physical abuse in their lifetime were about two and a half times more likely to have suicidal thoughts (OR = 2.47; 95% CI = 1.1, 5.5; $p = 0.026$). Individuals who reported having been sexually abused were about five times more likely to have suicidal thoughts (OR = 5.03; 95% CI = 2.0, 12.3; $p < 0.001$). We did not find statistically significant associations between suicidal

ideation and age, marital status, education level, frequency of injection drug use in the last six months, having had an overdose in the last six months, ASI drug use composite score, ASI alcohol use composite score, or income (all p -values > 0.10).

Table 3 presents multivariate models that include those variables found to be statistically significant in the bivariate analyses ($p < 0.10$) as well as the multivariate analyses ($p < 0.05$) (i.e., depression and HIV status). As shown, multiple logistic regression models controlling for HIV status and CES-D total score revealed that lifetime emotional abuse and lifetime sexual abuse perpetrated by a family or social network member were each independently associated with having suicidal thoughts in the last six months (Table 3, Models 1 and 2, respectively). In Model 1, individuals who experienced emotional abuse in their lifetime were more than two and half times as likely to have suicidal thoughts (Adjusted Odds Ratio (aOR) = 2.57; 95% CI = 1.2, 5.3; $p = 0.011$). Respondents who experienced sexual abuse in their lifetime were four times more likely to have suicidal thoughts in the last six months (aOR = 4.0; 95% CI = 1.6, 10.2; $p = 0.004$) (Model 2). Though significant in the unadjusted model, physical abuse lost significance in the multivariate model when we controlled for HIV status and CES-D score ($p = 0.123$) (results not shown). Additionally, in both Models 1 and 2 (Table 3), individuals who were HIV positive were over one-third less likely to report suicidal thoughts (aOR = 0.37 and 0.36, respectively; p -values = 0.029 and 0.023, respectively), and there were positive associations between elevated CES-D scores and suicidal thoughts (aOR=2.37 and 2.30, respectively; $p = 0.011$ and $p = 0.014$, respectively).

In subsequent analyses, we obtained adjusted estimates for the relationship between suicidal ideation and each form of abuse controlling for the other two forms of abuse. This was done by including in the model all three forms of abuse in addition to HIV status and CES-D score. In this model, emotional abuse lost statistical significance ($p = 0.116$) and physical abuse was not significant ($p = 0.235$); only sexual abuse remained statistically significant ($p = 0.033$) (results not shown).

In exploratory analyses, we tested for subgroup variation in the strength of the association between emotional, physical, and sexual abuse with suicidal ideation in the last six months. The results from these analyses did not provide evidence of subgroup variation by gender and each form of abuse or HIV status and each form of abuse (all interaction terms $p > 0.10$; results not shown).

DISCUSSION

In this study of male and female NEP attenders, more than one-quarter of the sample reported recent suicidal ideation. This estimate is comparable to that of Havens and colleagues (2006), who reported that the prevalence of suicidal ideation was 31% in a study of young IDUs in Baltimore. The prevalence estimate found in this study is comparable to the 28.5% lifetime prevalence and 20% two-year follow-up estimates for suicidal ideation found by Wines and colleagues (2004) in a study of patients enrolled in an inpatient unlocked detoxification unit in Boston, Massachusetts.

In support of our study hypotheses, we found emotional abuse and sexual abuse to be independently associated with recent suicidal ideation. Based on these findings, IDUs who experienced emotional abuse in their lifetime were more than two and a half times as likely to report having suicidal thoughts in the last six months. The magnitude of this association was even stronger for individuals who experienced sexual abuse in their lifetime; these individuals were four times more likely to report recent suicidal thoughts. Our finding of a relationship between emotional abuse and suicidal ideation is consistent with other studies that have found a relationship between emotional abuse and suicidal attempts in drug-using samples in East

Orange, New Jersey (Roy 2003,2002,2001b). Contrary to our hypothesis, we did not find an association between lifetime physical abuse and suicidal ideation after taking into account other relevant factors.

The association we found between sexual abuse and suicide is consistent with findings from prior studies of suicidal attempts among drug users (Havens et al. 2004; Braitstein et al. 2003; Roy 2003, 2002, 2001 b); however, fewer studies of male and female IDUs have documented such an association when the outcome of interest was suicidal ideation. In one such study, Deykin and Buka (1994) found a relationship between physical and sexual abuse and suicide attempt for males but not females in a sample of chemically dependent adolescents. In their sample of adolescent and young adult IDUs in Baltimore, Havens and colleagues (2004) found sexual abuse to be associated with a recent suicide attempt. Braitstein and colleagues (2003) observed a relationship between sexual abuse and attempted suicide in a study of adult IDUs in Vancouver, Canada.

Finding no association between physical abuse and suicidal ideation is contrary to what we expected and conflicts with evidence from previous studies in drug-using samples (Roy 2003,2002,2001b). Though negative, this finding is important because most studies have focused on sexual abuse and suicide attempts—few studies have examined the influence of physical abuse on suicidal ideation among IDUs. Of interest is our finding that only sexual abuse remained independently associated with suicidality when all three forms of abuse were included simultaneously in multivariate models (results not shown).

Although not a focus of this study, it was of interest that individuals who were HIV positive were less likely to report recent suicidal ideation compared with those who were HIV negative, even after controlling for potential confounders. This finding is contrary to previous studies that have found being HIV positive to be a risk factor for suicidal behaviors (Komiti et al. 2001). Although speculative, it is possible that HIV-positive drug users had sought and received social support or other interventions in the community, which may have offset any suicidal tendencies. This association bears further investigation.

We also found that a higher CES-D score (≥ 23) was significantly associated with recent suicidal ideation in the multivariate models. This is not a surprising finding given that depression and suicidal behavior are often correlated in nondrug-using (Petronis et al. 1990) as well as drug-using populations (Havens et al. 2006; Wines et al. 2004). Consistent with evidence from prior studies, we observed an association between ASI psychiatric status composite score and suicide ideation in the unadjusted model (Roy 2003); however, this relationship did not persist after adjusting for confounding factors. Although prior studies have found female drug users at increased risk for suicidal behaviors (Roy 2004, 2001a), we did not confirm this relationship.

The findings from this study are subject to several potential limitations. First, because the majority of study participants were African American, older, and residing in an urban area, generalizability to other populations is not certain. The study enrolled treatment-seeking IDUs who sought services from the Baltimore NEP; therefore the findings may not be generalizable to IDUs who do not use NEPs and those who are not treatment-seeking. In addition, due to the cross-sectional nature of our study, we were not able to establish the temporal sequence of the various forms of abuse and suicidal ideation.

Additionally, there are limitations with respect to the measures for this study. The measures for lifetime emotional, physical, and sexual abuse are specific and limited to abuse perpetrated by individuals within one's family or social network, and therefore do not take into account abuse perpetrated by strangers or individuals with whom one is less acquainted. Also, because we do not have measures for abuse perpetrated by individuals outside of one's family or social

network, we were not able to control for these variables in the multivariate analysis. Moreover, the fact that measures for emotional, physical, and sexual abuse are based on retrospective self-report data presents the possibility for recall and respondent bias. However, there is evidence that self-report data obtained from IDU populations are valid (Des Jarlais et al. 1999; Darke 1998; Latkin, Vlahov & Anthony 1993).

Our focus on suicidal ideation provides insight for prevention because suicidal ideation is a known antecedent of suicide plans, attempts, and completed suicides (Crosby, Cheltenham & Sacks 1999). Given that all of the subjects in this study were seeking drug-abuse treatment, the findings that emotional and sexual abuse are independently associated with suicidal ideation suggest the need for drug treatment programs and NEPs to screen IDUs for a history of abuse and to include suicide prevention intervention strategies for IDUs who have a history of emotional and/or sexual abuse. Furthermore, given that one-quarter of the sample demonstrated evidence of suicidality, the results may highlight the importance of incorporating suicide prevention into NEPs and drug-abuse treatment programs that provide services to IDUs.

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TABLE 1

Sample Characteristics of the Baltimore Needle Exchange Program Treatment Retention Intervention Study, 2002–2004

Variable	N	%
Age (mean $\pm$ SD)	245	42.2 $\pm$ 8.1
Gender		
Male	169	69.0
Female	76	31.0
Race		
African American	187	76.6
Other	58	23.4
HIV Status		
Negative	198	80.8
Positive	47	19.2
Had suicidal thoughts in the last six months		
No	179	73.1
Yes	66	26.9
Experienced lifetime emotional abuse		
No	198	82.8
Yes	41	17.2
Experienced lifetime physical abuse		
No	210	87.9
Yes	29	12.1
Experienced lifetime sexual abuse		
No	216	90.4
Yes	23	9.6

TABLE 2

Sample Characteristics, Estimated Odds Ratios (OR) and Confidence Intervals (CI) for Associations Between Selected Covariates and Suicidal Ideation in the Last Six Months

	Had Suicidal Thoughts (n = 66)		Did not have Suicidal Thoughts (n = 179)		Total Sample (n = 245)	Unadjusted OR	95% CI	p-Value
	n	%	n	%	n			
Age (mean $\pm$ SD)	66	42.1 $\pm$ 8.8	179	42.3 $\pm$ 7.8	245	1.00	0.9, 1.0	0.874
Gender								
Male	40	60.6	129	72.1	169	Referent		
Female	26	39.4	50	27.9	76	1.68	0.9, 3.0	0.087
Race								
African American	42	63.6	145	81.5	187	Referent		
Other	24	36.4	33	18.5	57	2.51	1.3, 4.7	0.004
HIV Status								
Negative	59	89.4	139	77.7	198	Referent		
Positive	7	10.6	40	22.3	47	0.41	0.2, 0.9	0.043
Marital status								
Never married	37	56.1	110	61.8	147	Referent		
Other	29	43.9	68	38.2	97	1.27	0.7, 2.2	0.416
Prior drug treatment								
Yes	45	68.2	143	79.9	188	Referent		
No	21	31.8	36	20.1	57	1.85	1.0, 3.5	0.056
Education level								
Less than high school	26	39.4	81	45.3	107	Referent		
High school or more	40	60.6	98	54.7	138	1.27	0.7, 2.2	0.413
Ever abused emotionally in lifetime								
No	45	69.2	153	87.9	198	Referent		
Yes	20	30.8	21	12.1	41	3.24	1.6, 6.5	0.001
Ever abused physically in lifetime								
No	52	80.0	158	90.8	210	Referent		
Yes	13	20.0	16	9.2	29	2.47	1.1, 5.5	0.026
Ever abused sexually in lifetime								
No	51	78.5	165	94.8	216	Referent		
Yes	14	21.5	9	5.2	23	5.03	2.0, 12.3	<0.001
Frequency of injection drug use in the last six months								
Less than two times per day	3	4.5	15	8.4	18	Referent		
Two or more times per day	63	95.5	164	91.6	227	1.92	0.5, 6.9	0.315
Ever had an overdose								
No	33	50.0	116	64.8	149	Referent		
Yes	33	50.0	63	35.2	96	1.84	1.0, 3.3	0.036
Overdosed in the last 6 months								
No	27	81.8	58	92.1	85	Referent		
Yes	6	18.2	5	7.9	11	2.58	0.7, 9.2	0.144
Depressive symptoms								
CES-D <23	16	24.2	81	45.3	97	Referent		
CES-D $\geq$ 23	50	75.8	98	54.7	148	2.58	1.4, 4.9	0.003
ASI drug use composite score (mean $\pm$ SD)	64	0.39 $\pm$ 0.09	172	0.39 $\pm$ 0.09	230	2.11	0.1, 59.5	0.660
ASI alcohol use composite score (mean $\pm$ SD)	64	0.13 $\pm$ 0.22	173	0.09 $\pm$ 0.19	237	2.24	0.6, 8.5	0.238
ASI psychiatric status composite score (mean $\pm$ SD)	64	0.32 $\pm$ 0.28	173	0.09 $\pm$ 0.16	237	82.8	19.6, 349	<0.001
ASI medical status composite score (mean $\pm$ SD)	65	0.37 $\pm$ 0.37	172	0.28 $\pm$ 0.35	237	2.0	0.9, 4.3	0.079
Income (mean $\pm$ SD)	65	1,186 $\pm$ 1256	179	1,209 $\pm$ 1055	244	1.0	1.0, 1.0	0.885

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Results from Multivariate Logistic Regression Analyses to Estimate Relationships Between Lifetime Abuse and Suicidal Ideation in the Last Six Months

TABLE 3

Model 1		Model 2	
Adjusted Odds Ratio	95% CI	Adjusted Odds Ratio	95% CI
Lifetime emotional abuse		Lifetime sexual abuse	
No	Referent	No	Referent
Yes	2.57	Yes	4.01
HIV status		HIV status	
Negative	Referent	Negative	Referent
Positive	0.37	Positive	0.36
Depressive symptoms		Depressive symptoms	
CES-D <23	Referent	CES-D <23	Referent
CES-D ≥ 23	2.37	CES-D ≥ 23	2.30
	1.2,4.6		1.2,4.5
	0.011		0.014