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Childhood sexual abuse and syringe sharing among people who inject drugs

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Abstract

Childhood sexual abuse is associated with adverse health outcomes. However, the impact of sexual abuse on HIV risk behaviors among people who inject drugs (IDU) has not been thoroughly characterized. We therefore sought to identify whether childhood sexual abuse was associated with syringe sharing among a sample of IDU in Vancouver, Canada. We assessed sexual abuse among two cohorts of IDUs via the Childhood Trauma Questionnaire (CTQ). Multivariate logistic regression was used to estimate the relationship between childhood sexual abuse and syringe sharing. In total, 1380 IDU were included in the study, and 426 (30.9%) IDU reported childhood sexual abuse. Syringe sharing (Adjusted Odds Ratio = 1.83, 95% Confidence Interval: 1.28–2.60) remained independently associated with childhood sexual abuse after adjustment for potential confounders. Given that a history of childhood sexual abuse appears to be elevated among IDU who engage in HIV risk behaviors (i.e., syringe sharing), HIV prevention efforts should include efforts to address historical trauma in this population.

Keywords

Childhood sexual abuse; syringe sharing; HIV-risk behavior; Injection Drug User

Introduction

Childhood maltreatment has been associated with a variety of adverse consequences related to adult health and functioning (1–3). More specifically, childhood sexual abuse has been associated with depression in adulthood, substance misuse and associated risk behaviors, including those related to HIV acquisition (4, 5). People who inject drugs (IDU) are known

to have experienced high levels of childhood trauma, and previous studies in the North American context have found that approximately 30% of drug-using youth and young-adults report having experienced childhood sexual abuse (6,7), compared to a prevalence of approximately 10% among a national sample of the general American population (8). Accordingly, childhood trauma is of public health concern not only because sexually abused children are more likely to initiate illicit drug use in adolescence or young adulthood (5), but also because these particular drug users are more prone to engage in high-risk activities, including injection drug use, sex work (7,9–11), and seeking out risky relationships (i.e., chaotic, unstable or polygamous relationships) (12). As such, these individuals are vulnerable to much preventable morbidity, including accidental overdose, violence and HIV-infection.

Various studies have evaluated the prevalence of childhood sexual abuse among IDU (13,14) and its relationship to HIV-related risk behaviors. For example, previous research has demonstrated a positive relationship between non-consensual sex and syringe sharing (15) as well as childhood sexual abuse and syringe sharing among American male high school student IDU (16). However, one study demonstrated that antisocial personality disorder acts as an important pathway to HIV-risk behavior among those with a history of sexual abuse, suggesting that if antisocial and delinquent behaviors were controlled for, some reduction in risky behavior may occur (17). Further, other research has found that family factors (i.e., positive maternal relationships) helped mitigate syringe sharing behavior among a cohort of sexually abused women (18). Given the complicated nature of the relationship between syringe sharing and childhood sexual abuse, and in an effort to inform public health responses and the development of psychosocial services targeting and addressing HIV risk within this population, this study aims to further examine the relationship between syringe sharing and childhood sexual abuse among IDU in Vancouver, Canada. The study hypothesizes a positive and independent association between not only syringe sharing and childhood sexual abuse, but also a significant association among an array of socio-demographic variables (i.e., race, housing status) and childhood sexual abuse.

Methods

We investigated the association between syringe sharing and childhood sexual abuse among participants enrolled in the Vancouver Injection Drug Users Study (VIDUS) and the AIDS Care Cohort to Evaluate Exposure to Survival Services (ACCESS) study. Since beginning in 1996, VIDUS has followed over 1,400 IDU who were recruited through street outreach efforts. In 2005, VIDUS was divided into two parallel studies, and VIDUS now follows HIV-negative IDU and ACCESS follows HIV-positive people who use illicit drugs. All study procedures remained the same, with the only change in the selection criteria being an HIV-positive test result to be recruited into ACCESS. Eligibility criteria for both studies included being 18 years or older at baseline, active injection drug use in the past months preceding the baseline interview, residence in the Greater Vancouver region, and the provision of informed consent. Commencing in 2005, an additional wave of recruitment was conducted for both studies with similar eligibility criteria. Although eligibility for the ACCESS study was eventually expanded to include persons reporting heavy non-injection drug use (use of drugs other than cannabis such as crack cocaine, methamphetamine) in the

past 6 months, given that our focus is on syringe sharing, this analysis was restricted to individuals who reported injecting drugs in the six months prior to their most recent interview.

Described in detail in previous research (19,20), participants were recruited through extensive outreach methods and snowball sampling. At baseline and during semi-annual follow-up visits, participants complete an interviewer-administered questionnaire, accompanied by blood sampling for HIV and Hepatitis C (HCV) testing, and HIV disease monitoring as appropriate. Pre- and post-test HIV counseling and referral to health services were provided as part of the study. Individuals received a \$20 honoraria upon completion of their study visits. The University of British Columbia/Providence Health Care Research Institute's Research Ethics Board provided ethical approval for the study.

In the present study, the dependent variable was self-reported moderate to severe childhood sexual abuse, as measured by the Childhood Trauma Questionnaire (CTQ) administered during each participant's first visit over the study period. The CTQ is comprised of a 28-item validated instrument that is used to assess (retrospectively) three forms of childhood abuse (i.e., sexual, physical, and emotional) and two forms of childhood neglect (i.e., physical and emotional). The CTQ provides a separate score for 5 subscales that correspond to each type of abuse and neglect, based on responses to 5 items. Using a 5-point Likert scale from 1) "never true" to 5) "very often true", participants respond to statements such as "When I was growing up I had to wear dirty clothes" (i.e., physical neglect) and "Someone tried to make me do sexual things or watch sexual things" (i.e., sexual abuse). All questions refer only to events that occurred during childhood. Each subscale produces scores ranging from 5 to 25. Across all 5 subscales, there are four levels of trauma: 1) none to minimal, 2) low to moderate, 3) moderate to severe, and 4) severe to extreme. For the analysis, we used recommended and pre-determined cut-off scores to translate the sexual abuse subscale score - 22 - then dichotomized it into two levels: none to minimal - 5-12 - versus moderate to severe - 13 or greater. We justified this decision based on previous studies involving drug-using populations which have shown that dichotomizing abuse into "abuse" vs. "no abuse" produces few significant findings (14). The reliability of the CTQ has been demonstrated previously (21,22), and the instrument has been used successfully in several studies of illicit drug-using populations (23,24).

Our primary independent variable of interest was syringe sharing, defined as having lent or borrowed used syringes to or from others in the previous six months. We also considered a range of secondary independent variables, including gender (female vs. male); median split age (≥ 42 years vs. < 42 years); Caucasian ethnicity (yes vs. no); unstable housing, defined as having lived in a single room occupancy (SRO) hotel (25) (yes vs. no); Downtown Eastside residency (yes vs. no); daily non-injection crack cocaine use (yes vs. no); daily cocaine injection (yes vs. no); daily heroin injection (yes vs. no); binge drug use (yes vs. no); incarceration (yes vs. no); suffered physical violence (yes vs. no); perpetrator of physical violence (yes vs. no); sex work (yes vs. no); had unprotected sex (yes vs. no); reported a history of suicide attempt (any attempts vs. none); HIV status, determined by serological testing (positive vs. negative); enrolled in drug or alcohol treatment (yes vs. no); reporting being unable to access alcohol or drug treatment (yes vs. no); non-fatal overdose

(yes vs. no); and required help injecting, a practice that is associated with HIV risk (yes vs. no). All behavioral and drug-use variables refer to behaviors in the last 6 months, unless otherwise specified. As previously mentioned, all variables were assessed through a face-to-face interviewer-administered questionnaire.

In the present study, we first examined the characteristics of participants using descriptive statistics. Then, we used Pearson's Chi-Square to estimate bivariate associations between each independent variable and childhood sexual abuse. Multivariate logistic regression was applied to look at whether syringe sharing was independently associated with childhood sexual abuse, after adjusting for confounders. To fit the multivariate model, we employed a conservative stepwise variable selection approach (26). Specifically, we included all variables found to be significantly associated with childhood sexual abuse in bivariate analyses (at $p < 0.10$) in a multivariate model, and then used a backwards stepwise approach to fit a series of reduced models. After comparing the value of the coefficient associated with syringe sharing in the full model to the value of the coefficient in each of the reduced models, we dropped the secondary variable associated with the smallest relative change. We continued this iterative process until the minimum change exceeded 5%. Remaining variables were considered as potential confounders in a final multivariate model. All statistical analyses were performed using SAS software version 9.3 (SAS, Cary, NC). All p -values are two sided.

As a final step, we conducted a mediation analysis to determine whether incarceration and binge drug use mediated the relationship between syringe sharing and childhood sexual abuse. We justified this decision based on previous research indicating a strong and independent association between incarceration and syringe sharing (27), and binge drug use and syringe sharing (28). Two methods were used: the Baron and Kenny approach (29), which involved running two GEE models for each analyses, one with and one without the suspected mediating variables (i.e., incarceration or binge drug use), to determine whether the syringe sharing variable maintained its significance after the incarceration or binge drug use variable was added, and the Sobel test statistic (30). These statistical tests for mediation have been used previously in other studies (31,32).

Results

In total, 1380 IDU from the VIDUS and ACCESS studies were included in this study, including 428 females (31.0%) and 848 Caucasians (61.4%). The median age at enrollment was 42 years (interquartile range [IQR] = 35 – 48). Overall, 426 (30.9%) individuals reported having a history of moderate to severe childhood sexual abuse, and 158 (11.4%) IDU reported syringe sharing in the previous six months.

As shown in Table 1, in bivariate analyses, factors positively associated with moderate to severe childhood sexual abuse included syringe sharing (OR = 1.77, 95% CI: 1.26–2.48), being female (Odds Ratio [OR] = 3.95, 95% Confidence Interval [CI]: 3.09–5.05), recent incarceration (OR = 1.39, 95% CI: 1.04–1.85), participating in sex work (OR = 2.81, 95% CI: 2.08–3.78), reporting a history of suicide attempt (OR = 2.66, 95% CI: 1.95–3.63), non-fatal overdose (OR = 1.53, 95% CI: 1.00–2.33) and required help injecting (OR = 1.36, 95%

CI: 1.05–1.76). Factors negatively associated with moderate to severe childhood sexual abuse included being 42 years old (OR = 0.61, 95% CI: 0.49–0.77), being Caucasian (OR = 0.52, 95% CI: 0.42–0.66) and unstable housing (OR = 0.82, 95% CI: 0.64–1.06).

In a multivariate analysis, as shown in Table 2, after adjusting for confounding variables, syringe sharing (Adjusted Odds Ratio [AOR] = 1.83, 95% CI: 1.28–2.60) remained positively and independently associated with childhood sexual abuse. Other variables positively associated with sexual abuse in the final model included reporting a history of suicide attempt (AOR = 2.53, 95% CI: 1.84–3.47), and recent incarceration (AOR = 1.34, 95% CI: 0.99–1.80). Being Caucasian (AOR = 0.51, 95% CI: 0.40–0.64) was negatively associated with childhood sexual abuse.

Mediation analysis shows that both incarceration (Sobel test statistic = 1.67, $p = 0.095$) and binge drug use (Sobel test statistic = 0.87, $p = 0.383$) did not mediate the relationship between syringe sharing and sexual abuse.

Discussion

In the present study, approximately one-third of IDU participants reported experiencing moderate to severe sexual abuse during childhood. Among those who had been sexually abused, approximately 16% had reported having shared syringes in the last 6 months. By comparison, among IDU who have not been sexually abused, only 10% have reported sharing syringes. In a multivariate analysis, after adjustment for a range of potential confounders, syringe sharing remained independently and positively associated with childhood sexual abuse, with individuals reporting moderate to severe sexual abuse being almost two times more likely to have recently shared syringes. Further, this relationship between syringe sharing and childhood sexual abuse persisted, despite having added incarceration or binge drug use as mediating variables. Having a history of attempted suicide and recent incarceration were also positively associated with childhood sexual abuse, whereas being Caucasian was negatively associated with childhood sexual abuse. To our surprise, unstable housing was associated with sexual abuse in bivariable analyses. While this association did not retain significance in the final multivariable model, future research should seek to explore this relationship.

In general, our finding that our primary independent variable of syringe sharing was positively associated with childhood sexual abuse is consistent with past research on this topic (33,34). However the work in this area has been somewhat equivocal. For example, Medrano and colleague's study looking at sexually abused women IDU in San Antonio, Texas, found no association between syringe sharing and historical sexual abuse (35). Similarly, Kang and colleagues found no significant association between syringe sharing and history of sexual abuse among drug users in New York City who had dropped out of a methadone maintenance therapy program (36). This discrepancy could be due in part to differences in the populations studied and the methodologies employed. Nevertheless, our study highlights the need for preventive programs that target youth who are at-risk of sexual abuse in an effort to reduce future syringe sharing behavior and other harmful HIV-risk related practices. A small body of evidence suggests that home visits as well as in-hospital

visits are effective in preventing such forms of childhood maltreatment (37). Furthermore, it is also important to encourage intervention strategies focusing on those IDU who have previously experienced childhood sexual abuse. Macmillan and colleagues (38) have found that cognitive behavioral therapy and enhanced foster care have shown promising results in terms of addressing various sequelae associated with childhood maltreatment.

We found that having a history of suicide attempts was also associated with childhood sexual abuse. This is consistent with a large body of literature documenting associations between sexual abuse and suicide risk and attempts (38–40). The pathways between childhood sexual abuse and suicidal behavior have been well-described. Early exposure to traumatic events, such as sexual abuse, can adversely affect brain development, which in turn can lead to the development of mental disorders (e.g., major depressive disorder, and posttraumatic stress disorder) that predispose individuals to suicide (41). Symptoms related to these disorders may discourage practices that protect health, including use of sterile syringes. Indeed, past research has pointed to the problem of ambivalence toward death among IDU (42), which may explain the association between historical sexual abuse and history of attempted suicide observed in the present study. Further, it is important to note that several mental disorders, including those that may explain the observed association between syringe sharing and childhood sexual abuse, have also been identified as mediating factors between sexual abuse and suicidal behavior (43–45). Given the possibility that psychological distress may underlie and encourage syringe sharing behavior, early identification of these symptoms among sexually abused IDU should be an important component of HIV prevention strategies aimed at reducing syringe sharing behavior. However, such individually-focused interventions should not supplant efforts to address the social, structural, economic, and physical factors that create conditions which facilitate sexual abuse and syringe sharing. Likewise, harm reduction programs that have been shown to reduce syringe sharing, such as syringe distribution programs and supervised injection sites (46–48), should continue to be implemented and brought to appropriate scale. While this is not the primary focus of our study, this finding points to the need for further research that examines the role of suicidal behavior, and other mental health disorders such as major depressive disorder, in the context of syringe sharing and its relationship with childhood sexual abuse.

Our finding of an independent association between childhood sexual abuse and incarceration is consistent with past studies (14,49), and possible reasons for this association have been discussed in several studies (50–52). A study involving over 400 young women found that those who were sexually abused as children were more likely to run away from home as a means of escape (50). In turn, this act of running away may put these young women at greater risk of activities that can result in incarceration, including theft, illicit drug use, and sex work. In one study involving a sample of 301 male offenders, two thirds had experienced physical and sexual abuse (53), and another study noted that 415 (69%) out of 601 offenders reported childhood trauma (54). Given the prevalence of risks that predispose sexually abused persons to incarceration and the multitude of ways in which sexually abused individuals can enter the criminal justice system, it is incumbent upon policy makers and health professionals to implement early-life interventions that acknowledge and address the various risk factors that may lead sexually abused persons to becoming incarcerated.

This study has limitations. First, the study sample was not randomly selected and therefore may not be generalizable to other IDU in Vancouver and in other settings. However, all cohort studies of high-risk or marginalized populations generally suffer from this limitation since there are no registries from which to draw random samples. Second, the study relied on self-reported data, which may be subject to reporting biases, including socially desirable reporting and recall bias. Third, we have not included any measures for mental health disorders in our study, as questions pertaining to mental health disorders were not incorporated in the questionnaire. Our findings have, however, pointed to the importance of considering these disorders in the context of syringe sharing and its association with childhood sexual abuse; thus, future research on this specific topic should be undertaken. Lastly, based on our objectives and statistical procedures, another limitation of our study is that we cannot determine a causal relationship between syringe sharing and childhood sexual abuse.

In conclusion, we found approximately one-third of IDU in Vancouver reported a history of moderate to severe childhood sexual abuse. In a multivariate model, syringe sharing was independently associated with childhood sexual abuse. Attempted suicide and incarceration was also independently and positively associated with childhood sexual abuse. Our study contributes to the body of research highlighting the negative impact that childhood sexual abuse has on the health of IDU, namely through the propagation of HIV risk behaviors, including syringe sharing. Given that childhood sexual abuse is likely contributing to epidemics of infectious disease among IDU by promoting syringe sharing, research, policy, and program development should focus not only on strategies that mitigate syringe sharing, but also those that seek to prevent sexual abuse.

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Table 1

Characteristics and bivariate associations with childhood sexual abuse among people who inject drugs in Vancouver, Canada (n = 1380)

Characteristic	Yes 426 (30.9%)	No 954 (69.1%)	Odds Ratio (95% CI)	p - value
Syringe sharing*				
Yes	67 (15.7)	91 (9.5)	1.77 (1.26–2.48)	0.001
No	359 (84.3)	863 (90.5)		
Age				
42 years	182 (42.7)	524 (54.9)	0.61 (0.49–0.77)	< 0.001
< 42 years	244 (57.3)	430 (45.1)		
Gender				
Female	222 (52.1)	206 (21.6)	3.95 (3.09–5.05)	< 0.001
Male	204 (47.9)	748 (78.4)		
Caucasian ethnicity				
Yes	216 (50.7)	632 (66.2)	0.52 (0.42–0.66)	< 0.001
No	210 (49.3)	322 (33.8)		
HIV serostatus				
Positive	165 (38.7)	349 (36.6)	1.10 (0.87–1.39)	0.450
Negative	261 (61.3)	605 (63.4)		
Unstable housing*				
Yes	288 (67.6)	684 (71.7)	0.82 (0.64–1.06)	0.124
No	138 (32.4)	270 (28.3)		
DTES Residency				
Yes	265 (62.2)	620 (65.0)	0.89 (0.70–1.12)	0.320
No	161 (37.8)	334 (35.0)		
Daily crack use*				
Yes	188 (44.1)	370 (38.8)	1.25 (0.99–1.57)	0.062
No	238 (55.9)	584 (61.2)		
Daily cocaine use*				
Yes	48 (11.3)	97 (10.2)	1.12 (0.78–1.62)	0.538
No	378 (88.7)	857 (89.8)		
Daily heroin use*				
Yes	115 (27.0)	262 (27.5)	0.98 (0.76–1.26)	0.857
No	311 (73.0)	692 (72.5)		
Binge drug use*				
Yes	181 (42.5)	374 (39.2)	1.15 (0.91–1.45)	0.250
No	245 (57.5)	580 (60.8)		
Needed help injecting*				
Yes	121 (28.4)	216 (22.6)	1.36 (1.05–1.76)	0.022
No	305 (71.6)	738 (77.4)		

Characteristic	Yes 426 (30.9%)	No 954 (69.1%)	Odds Ratio (95% CI)	p - value
Incarceration*				
Yes	91 (21.4)	156 (16.4)	1.39 (1.04–1.85)	0.025
No	335 (78.6)	798 (83.6)		
Suffered violence*				
Yes	107 (25.1)	214 (22.4)	1.16 (0.89–1.51)	0.276
No	319 (74.9)	740 (77.6)		
Perpetrator of violence*				
Yes	60 (67.6)	128 (13.4)	1.16 (0.89–1.51)	0.124
No	366 (32.4)	826 (86.6)		
Unprotected sex*				
Yes	92 (21.6)	176 (18.4)	1.22 (0.92–1.62)	0.173
No	334 (78.4)	778 (81.6)		
Sex work*				
Yes	108 (25.4)	103 (10.8)	2.81 (2.08–3.78)	< 0.001
No	318 (74.6)	851 (89.2)		
Ever attempted suicide				
Yes	96 (22.5)	94 (9.9)	2.66 (1.95–3.63)	< 0.001
No	330 (77.5)	860 (90.1)		
Drug or alcohol treatment*				
Yes	237 (55.6)	482 (50.5)	1.23 (0.98–1.55)	0.080
No	189 (44.4)	472 (49.5)		
Unable to access treatment*				
Yes	22 (5.2)	51 (5.3)	0.96 (0.58–1.61)	0.890
No	404 (94.8)	903 (94.7)		
Non-fatal overdose*				
Yes	39 (9.2)	59 (6.2)	1.53 (1.00–2.33)	0.049
No	387 (90.8)	895 (93.8)		

* Activities/behaviors in the previous six months,

CI: Confidence Interval, DTES: Downtown Eastside

Table 2

Multivariate logistic regression of factors associated with childhood sexual abuse among people who inject drugs in Vancouver, Canada (n = 1380)

Variable	Adjusted Odds Ratio (AOR)	95% Confidence Interval (CI)	p - value
Syringe sharing *			
Yes vs. No	1.83	(1.28–2.60)	< 0.001
Caucasian ethnicity			
Yes vs. No	0.51	(0.40–0.64)	< 0.001
Incarceration *			
Yes vs. No	1.34	(0.99–1.80)	0.055
Ever attempted suicide			
Yes vs. No	2.53	(1.84–3.47)	0.001

* Activities/behaviors in the previous six months,

CI: Confidence Interval.