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Substance Use, Childhood Sexual Abuse and Sexual Risk Behavior among Women in Methadone Treatment

Lisa R. Cohen, PhD^{1,2}, Susan Tross, PhD^{1,3}, Martina Pavlicova, PhD⁴, Mei-Chen Hu, PhD⁴, Aimee N. Campbell, MSW⁵, and Edward V. Nunes, MD¹

¹Substance Use Research Center, Department of Psychiatry, Columbia University Medical Center

²City College of New York

³HIV Center for Clinical and Behavioral Studies, Department of Psychiatry, Columbia University Medical Center

⁴Department of Biostatistics, Columbia University Medical Center

⁵Columbia University School of Social Work

Abstract

Substance use and a history of childhood sexual abuse have both been identified as risk factors for unprotected sex among women, yet questions remain as to how their combined influence may differentially affect sexual risk behavior. In the current study a Generalized Linear Mixed Model was used to examine the interaction effect between current cocaine and opioid use and a history of childhood sexual abuse (CSA) on number of unprotected sexual occasions (USO) in a sample of 214 sexually active women in outpatient methadone maintenance treatment programs. Results show significant interaction effects between drug use in the past 30 days and CSA on unprotected sexual occasions. These interactions, however, differ depending on type of drug used and CSA status. For women with CSA, an increase in days of cocaine use was significantly associated with an increase in USO, whereas an increase in number of days of opiate use was not significantly associated with an increase in USO. In contrast, for women who did not report CSA, an increase in number of days of cocaine use was associated with a significant decrease in USO and number of days of opiate use was significantly correlated with an increase in USO. Findings indicate that CSA is related to unprotected sexual occasions depending on drug type and severity of use. Women with childhood sexual abuse using cocaine are at particularly high risk for having unprotected sex, which suggests that this group of women should be specifically targeted for HIV prevention interventions.

Rates of HIV infection and AIDS among women have been steadily increasing (1) with women now accounting for more than a quarter of all new HIV/AIDS diagnoses in the United States (2). Heterosexual transmission is the predominant mode of infection among women, surpassing injection drug use, and accounting for an estimated 80% of new HIV infections in 2005 (2). Given these trends, it is critical to increase our understanding of contextual factors affecting women, including substance abuse and childhood victimization, which are often associated with sexual risk behaviors.

Corresponding Author: Lisa R. Cohen, Ph.D., Research Scientist at Substance Use Research Center, Department of Psychiatry, Columbia University Medical Center and at The City College of New York.

Mailing Address: City College Dept. of Psychology, North Academic Campus, rm 7-120, 160 Covent Avenue, New York, NY 10031, 212-650-8965, lc21302@columbia.edu

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Female drug users are at especially high risk for heterosexual transmission of HIV (3,4). Studies have consistently found that women who abuse substances have more unprotected sex than nonusers (5-8). Cocaine use in particular has been linked with risky sexual behavior, and is positively associated with increased rates of unprotected sex among drug users (9-11).

Patients attending methadone maintenance programs have been identified as one group of drug users that may be disproportionately affected by sexual risk behavior (12). Several studies have documented that crack/cocaine use is a frequent problem among female methadone patients (12), and that consistent with findings on other drug-using populations, there is a strong association between cocaine use and sex without condoms (13,14). Bux and colleagues found that this relationship remained significant even after controlling for other drug use and demographic factors (15).

Another group identified as being at high risk for heterosexual transmission of HIV is women with childhood sexual abuse (CSA) histories. CSA has been associated with a variety of risky sexual behaviors in adulthood including inconsistent use of condoms (16,17). The relationship between CSA and sexual risk behaviors has been consistently found across studies even when varying definitions of CSA have been used (18), and when other variables known to be associated with HIV sexual risk behaviors have been controlled (19). Though women with CSA often have multiple additional trauma exposures, including childhood physical abuse and domestic violence, CSA has been shown to be independently related to HIV sexual risk behaviors (20). Greenberg and colleagues (21) found that compared to nonabused women, women with CSA were less likely to use condoms and more likely to use drugs and alcohol before sex. This finding is consistent with literature demonstrating that childhood abuse, particularly CSA, often contributes to a women's lack of self-protection in sexual situations and is a risk factor for the initiation into and escalation of substance use among women (22). It has also been established that disproportionately large numbers of women seeking treatment for drug use problems report sexual and/or physical abuse in childhood (23).

Though several studies have focused on the connection between substance use, particularly cocaine use, and sexual risk behavior and on CSA and sexual risk behavior, fewer studies have focused on the interaction of these important contextual factors. The aim of the current investigation is to explore how the complex relationships among substance use and CSA may be contributing to high rates of unprotected intercourse and increasing risk for HIV in a sample of 214 women currently enrolled in methadone maintenance programs. Specifically, we will investigate the impact of cocaine/stimulant and opiate use, CSA status, and their respective interactions on unprotected sexual occasions (USOs). We hypothesize that women with more frequent drug use (cocaine/stimulants and heroin) who have the additional risk of CSA will have higher USOs compared to women without CSA.

Methods

This study was conducted through the National Institute on Drug Abuse Clinical Trials Network. Participants were 214 sexually active women who were recruited into a multi-site randomized clinical trial testing the efficacy of an evidence based HIV/STD intervention for female drug users (For more detailed description of the treatment trial and primary outcomes see Tross et al., 2008 (24)). The protocol was implemented in seven community-based methadone maintenance treatment programs. Sites were located in the Northeast (4 sites), Southeast (1 site), and West coast (2 sites). Data reported here are from a secondary analysis using assessments conducted at baseline prior to randomization into the study.

Study Population

Women in treatment were recruited between May 2004 and October 2005 through fliers, announcements and word of mouth. Women were paid \$5 to complete a brief screening interview, with broad eligibility criteria and few exclusions, in an effort to maximize the representativeness of the sample. Women were eligible if they were > 18 years old, able to understand and speak English, participating in drug treatment for at least 30 days to assure methadone dose stability, and had unprotected vaginal or anal intercourse with a male partner within the past 6 months. Women were excluded if they exhibited significant cognitive impairment, denoted by a score of < 25 on the MiniMental Status Exam (25); or were currently pregnant, or immediately planning pregnancy. The study was approved by the Institutional Review Boards of Columbia University/New York State Psychiatric Institute and at all seven treatment sites. All participants gave written informed consent to enter the study at baseline assessment.

Design and Procedures

After determination of eligibility and consent, participants were paid \$25 to complete an approximately two and a half hour baseline interview to assess sexual risk behaviors, demographics, substance use, interpersonal history and current functioning. After baseline assessment participants were randomly assigned to one of two active treatments: a female-specific 5-session safer sex skills building group intervention or a single session standard HIV education.

All measures were administered by a trained research assistant, except sexual risk behaviors. Sexual activity and risk behavior was assessed using the Sexual Experiences and Risk Behavior Assessment Schedule (SERBAS) (26). The SERBAS ascertains the number of unprotected vaginal and anal intercourse occasions by partner type, number of partners, and gender of partners for the 3-months prior to each assessment, using timeline-follow back cues for recall. The SERBAS has good evidence of reliability and validity among injection drug users (27), and women at high risk for HIV (28). For this study, the SERBAS was administered using an audio computer-assisted self-interview format completed by the participant independent of the interviewer. Several studies have suggested that research participants report higher, and likely more accurate, rates of sexual risk behaviors during computer-assisted interviews, as compared to interviews with a researcher (29,30).

Childhood sexual abuse was assessed using the Abuse Experiences Questionnaire (AEQ), a measure derived from the SERBAS, which inquires about lifetime and current physical, sexual and emotional abuse. Respondents were asked whether they had experienced sexual abuse or assault as a child or adolescent. Childhood sexual abuse was defined as any sexual contact that was unwanted or against the participant's will prior to age 14 by an adult.

Substance use was measured by the *Addiction Severity Index: ASI-Lite*, revised version of the 1997 ASI Fifth Edition (31), a standardized, semi-structured interview that provides information regarding type and frequency of drug use in the past 30 days.

Data Analysis

Mixed Effects Modeling (MEM) was used to test the effect of the main factors: number of days of cocaine/stimulant use and of opiate use in the past 30 days and childhood sexual abuse on the outcome variable: number of unprotected sexual occasions over the past 3 months (USOs). MEM was considered an optimal approach for analyzing the main effects of days of drug use and sexual abuse history and their interactions on the outcome variable, while estimating random effect due to site, and accommodating for missing data (provided missing data occurred at random). Since the modeled variable USO is a count variable with Poisson distribution, the

loglinear link function was used within all models. All analyses were carried out in SAS®, using GLIMMIX (32).

The count data Poisson model used in this study yields the effect of the independent variable expressed as an odds ratio. Typically these odds ratios are small with narrow confidence intervals due to the fact that they express the increment in risk for each one-point increment in the predictor variable (e.g., days of drug use). Models are presented below and then to further illustrate the size of effects they are also graphed.

Results

Sample characteristics are presented in Table 1. Close to half (40.2%) of participants endorsed CSA prior to age 14. In the 30 days prior to baseline, 40.7% of the sample reported using cocaine/stimulants, 45.3% reported using opiates, and 22.7% reported using both. The sample mean of USOs in the past 3 months is 21.3 (SD = 32.8). For women reporting CSA (n = 86) mean USOs is 19.58 (SD = 24.86); for women reporting no CSA (n = 128) $M = 22.44$ (SD = 37.28). For women who used cocaine/stimulants in the past 30 days (n = 87) $M = 22.48$ (SD = 26.20); for women reporting no cocaine use (n = 127) $M = 20.47$ (SD = 36.76); for women reporting opiate use in the past 30 days (n = 97) $M = 22.02$ (SD = 27.63); and for women reporting no opiate use (n = 117) $M = 20.68$ (SD = 36.68).

Table 2 presents the Mixed Effect Model. The model examined days of drug use (cocaine/stimulants and opiates), CSA, and their respective interactions in relation to the outcome variable: USO adjusting for the demographic variables of age, education, and, race/ethnicity. Age and race/ethnicity are significantly associated with USO in the model. Women who are 40 or older have significantly fewer USOs than women under 40 (AOR = .56, $p < .001$). African-American (AOR = .68, $P < .001$) and Latina women (AOR = .44, $p < .001$) have significantly fewer USOs than white participants. There are significant interactions between CSA and number of days of cocaine/stimulant use (AOR=1.03, $p < .001$), and CSA and number of days of opiate use (AOR=.97, $p < .001$) on USOs. The association between drug use and the number of USOs varied by the type of drug and by the presence or absence of CSA.

Table 3 presents the relationship of cocaine and opiates to the number of USOs for subgroups of women with CSA (n= 86) and without CSA (n=128). Among the women who reported CSA, for each day of cocaine/stimulant use there was a 3% increase in USOs. In contrast, a one-day increase in opiate use was associated with a slight decrease (1%) of USOs.

For the group of women who did not report CSA, a one-day increase in cocaine/stimulant use was associated with a slight decrease (1%) of USOs, whereas for each day of opiate use there was a 2% increase in USOs.

Figure 1 displays the association of substance use and USOs among the subgroup of women who reported CSA. For these participants, an increase in number of days of cocaine/stimulant use was associated with an increase in USOs. The statistical model estimates that participants with no cocaine use had 16 USO whereas participants with daily cocaine use had almost double the number of USOs. In contrast, an increase in days of opiate use was associated with a decrease in USO in this subgroup of women. The statistical model estimates that participants with no opiate use had 18 USOs and participants with daily use in the past 30 days had 30% fewer USOs (12 USO).

Figure 2 displays the associations of substance use and USOs among the subgroup of women without CSA. Participants in this subgroup showed an increase in USO with increased opiate use. The statistical model estimates that participants with no opiate use had 18 USO and

participants with daily opiate use had almost double that. An increase in days of cocaine/stimulant use was not significantly associated with an increase in USO.

Discussion

This study explored the interaction between childhood sexual abuse and recent frequency of cocaine/stimulant and opiate use on HIV sexual risk behavior in a sample of female methadone patients. The rates of continued cocaine/stimulant, and opioid use found in this study are consistent with other studies of methadone maintained samples in community treatment programs (15,33). As expected, high rates of CSA were found among the sample.

Previous research indicates that women who have been sexually abused as children are more likely to have unprotected sex than women who do not have a sexual abuse history and that substance abusing women, particularly those who use cocaine, are more likely to have unprotected sex than non substance abusing women. Findings of the current investigation indicate complicated interactions between these two risk factors. As hypothesized, there was a significant interaction between frequency of drug use and CSA status on USOs. These interactions varied depending on type and frequency of drug use. For both cocaine/stimulants and opiates, CSA was not meaningful when frequency of drug use was low, however, when drug use was more frequent, significant differences between those with and without CSA on USOs emerged. Thus, regardless of the direction of the interaction, findings indicate that sexual risk behavior differed for women with CSA but only when drug use was more severe.

Findings related to cocaine/stimulant use follow study hypotheses and are consistent with previous research. Specifically, for women who reported CSA, increased cocaine/stimulant use was associated with an increase in USOs in comparison to women without CSA. Findings related to opiate use, however, were in the opposite direction of those hypothesized. For women with CSA, increased opiate use was associated with a decrease in USOs. Since a reduction in USOs could be a result of either more condom use or of less sexual activity we also modeled the total number of sexual occasions as a function of drug use and CSA. We found a similar pattern of results suggesting that a decrease in USOs may be explained, in part, by a reduction in sexual activity.

Current findings also indicate that at more severe levels of use different types of drugs are associated with different sexual behavior patterns. Specifically the disinhibiting effect of cocaine may elicit impulsive/risky sexual behavior, whereas the inhibitory quality of opiates may dampen sexual desire and suppress sexual activity. The motivation for using opiates may or may not be related to sexual behavior.

Considering why and how traumatized women use cocaine/stimulants and opiates may be important in understanding these findings. One relevant factor may be the long-term sequelae of CSA. The long-term effects of early sexual abuse on later sexual functioning have been well-documented with research showing that women with sexual abuse histories often struggle with pervasive sexual problems (34). These difficulties can take many forms ranging from sexual avoidance to compulsive sexual activity. Whereas some women report little sexual desire and a tendency to avoid sexual relationships, other women report a compulsive desire for sexual contact and are likely to engage in multiple, short-term sexual relationships (35, 36). It is important to note that these sexual behaviors are not necessarily mutually exclusive. Both sexual avoidance and impulsive, risky sexual behavior are characterized as mechanisms used by trauma survivors to avoid, minimize, or manage painful internal experiences and posttraumatic stress disorder symptoms including trauma related flashbacks, intrusive thoughts, memories, and/or unpleasant physical sensations during sexual activity (37). Though

these various avoidance strategies may work in the short term to decrease distress, ultimately they exacerbate sexual problems (38).

Using cocaine is known to be associated with increased disinhibition and impulsivity. Women with abuse histories may be using cocaine in part to manage trauma related symptoms. Those who are hypersexual might use cocaine to increase sexual activity whereas women who are avoidant of sexual activity may use it so they can cope with any sexual intimacy and increase the likelihood of having sex. Unfortunately use of cocaine can put women in high risk situations in which they are less likely or able to be self-protective resulting in higher risk for HIV. For example, in these situations women may be at higher risk for sexual coercion and unprotected sex or have more difficulty negotiating for safer sex. Even in the absence of drug use these risks are often higher for women with sexual abuse histories.

Women in this study who report CSA may not be using opiates in the same way that they are using cocaine. Whereas cocaine may be releasing the sexual risk behavior, opiates may be suppressing this risk. Opiates may be used because of their inhibitory effect as a way to reduce sexual behavior, thereby decreasing the risk of unprotected sex.

Study Strengths and Limitations

This study has several strengths. Our analyses go beyond main effects to look at more complex interactions among identified risk factors. We also controlled for demographic variables, which are often associated with increased risk for USOs. Additionally, our sample size is fairly large, especially in comparison to the majority of studies in this area, and drawn from a multi-site study including participants from diverse regions and treatment programs. In addition, research staff from the treatment programs was trained centrally by the coordinating site, led by the principal investigator, and rigorous quality assurance procedures were in place. These training and monitoring activities increased the consistency and integrity of data.

There are also several limitations to the current study. The study sample is comprised of women enrolled in methadone maintenance programs. Findings may not be generalizable to non-methadone samples of substance abusing women or to women not currently in drug treatment. In addition, women in our sample were participants in a safer sex intervention study. Findings may differ for women not willing or eligible to participate in this type of research. Reliance on self-report measures is another limitation. Asking about sexual abuse history requires participants to recall events that occurred during childhood. Retrospective recall of information is highly dependent on memory, which is not always reliable for events that often occur many years in the past. However, findings from several studies have indicated accuracy in retrospective reports of childhood victimization and good discriminant validity with the main limitation being underreporting (39). Childhood sexual abuse was inquired about in a general way and may have been interpreted differently by respondents. Providing a definition using more specific parameters about type of sexual contact and perpetrator(s) may have yielded different results. We also would have liked to examine the relationships between drug use, CSA, and symptoms of posttraumatic stress disorder. Unfortunately PTSD was not assessed in this study. Finally, the cross-sectional nature of the study design does not allow us to make causal conclusions or to examine patterns over time.

Implications and Future Directions

Findings of this study indicate that there are high levels of women reporting CSA in methadone programs and that the relationship between childhood sexual abuse and unprotected sexual occasions differs depending on drug type and frequency. Women with CSA using cocaine are at particularly high risk for having unprotected sex, which suggests that this group of women should be targeted in risk reduction interventions. More research is needed to untangle the

complex relationships between childhood sexual abuse, drug use, and sexual risk behavior. Understanding how a history of trauma may be related to drug abuse and sexual behavior is important for assessing and treating female substance use populations and an important component for management of sexual risk. Given that sexual behavior of sexual abuse survivors can take many forms, it is also important to assess for individual differences. Thus in addition to interventions which focus on risk reduction and decreasing vulnerability to using unsafe sexual practices, interventions which can address the full range of sexual patterns, including avoidance of sexual intimacy are also needed.

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