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

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Background: Substance use and a history of childhood sexual abuse (CSA) are risk factors for unprotected sex among women, yet questions remain as to how their combined influence may differentially affect sexual risk. Objective: The current study investigated how complex relationships among drug use and CSA may contribute to unprotected sexual occasions (USO). Methods: A Generalized Linear Mixed Model was used to examine the interaction between current cocaine/stimulant use and opioid use and CSA on number of USOs in a sample of 214 sexually active women in outpatient methadone maintenance treatment. Results: For women with CSA, an increase in days of cocaine/stimulant use was associated with a significant increase in USOs. In contrast, an increase in days of opiate use was associated with a significant decrease in USOs. For the group of women who did not report CSA, there was a significant increase in USOs with increased opiate use. Conclusions: Findings indicate that CSA is related to unprotected sexual occasions depending on drug type and severity of use. Scientific Significance: Women with CSA using cocaine are at particularly high risk for having unprotected sex and should be specifically targeted for HIV prevention interventions.

Keywords

INTRODUCTION

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.

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), even after controlling for other drug use and demographic factors.

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 persists 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 lifetime trauma exposures, CSA has been shown as independently related to HIV sexual risk behaviors (20). 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 (21) and that childhood abuse, particularly CSA, is a risk factor for substance use among women (22).

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, few studies have examined 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 higher rates of unprotected intercourse and increasing risk for HIV. Specifically, we will investigate the impact of cocaine/stimulant and opiate use, CSA status, and their respective interactions on unprotected sexual occasions (USOs) in a sample of women enrolled in methadone maintenance programs. We hypothesize that women with more frequent drug use who have the additional risk of CSA will have higher USOs compared to women without CSA.

**Study Population**

Women in treatment were recruited between May 2004 and October 2005. Participants 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 prior 6 months. Women were excluded if they exhibited significant cognitive impairment, denoted by a score of < 25 on the Mini-Mental Status Exam (24); or were currently or immediately planning to become pregnant. The study was approved by the Institutional Review Boards of Columbia University/New York State Psychiatric Institute and at all treatment sites.

**Design and Procedures**

After consent and determination of eligibility at a brief screening assessment, participants completed an approximately two and a half hour baseline interview to assess sexual risk behaviors, substance use, and trauma history.

All measures were administered by a trained research assistant, except sexual activity and risk behaviors, which were assessed using the Sexual Experiences and Risk Behavior Assessment Schedule (SERBAS) (25). The SERBAS ascertains the number of unprotected vaginal and anal intercourse occasions by partner type, number of partners, and gender of partners in the prior 3-months, using timeline-follow back cues for recall. The SERBAS has evidence of good reliability and validity among women at high risk for HIV (26). For this study, the SERBAS was administered using an audio computer-assisted self-interview format. 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 (27, 28).

Childhood sexual abuse was assessed using the Abuse Experiences Questionnaire (AEQ), a measure derived from the SERBAS, which inquires about lifetime 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 a brief version of the Addiction Severity Index (ASI) (29), a standardized, semistructured 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 USOs over the past 3 months.
MEM was considered an optimal approach for analyzing the main effects and their interactions on the outcome variable, while estimating random effect due to site, and accommodating for missing data. Since the modeled variable USO is a count variable with Poisson distribution, the loglinear link function was used within all models.

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.

RESULTS

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).

Table 1 presents results for the Mixed Effect Model. The model examined days of drug use, CSA, and their respective interactions in relation to the outcome variable USO adjusting for age, education, and race/ethnicity. 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 2 shows 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, an increase in number of days of cocaine/stimulant use was associated with an increase in USOs. For each day of cocaine/stimulant use there was a 3% increase in USOs with the statistical model estimating that participants with no cocaine use had 16 USOs and 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 USOs for women with CSA. A one-day increase in opiate use was associated with a slight decrease (1%) of USOs with the statistical model estimating that participants with no opiate use had 18 USOs, and participants with daily use had 12 USOs (30% fewer).

For the group of women who did not report CSA, there was an increase in USOs with increased opiate use. For each day of opiate use there was a 2% increase in USOs with the statistical model estimating that participants with no opiate use had 18 USOs, and participants with daily opiate use had almost double that number. A one-day increase in cocaine/stimulant use was associated with a slight decrease (1%) of USOs.

DISCUSSION

This study explored the interaction between CSA and recent frequency of cocaine/stimulant and opiate use on HIV sexual risk.

<table>
<thead>
<tr>
<th>TABLE 1</th>
<th>Associations of demographic variables, childhood sexual abuse, drug use and their interactions with number of unprotected sexual occasions (n = 214)</th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>AOR</td>
</tr>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>&lt; 40</td>
<td>50.9</td>
</tr>
<tr>
<td>&gt; 40</td>
<td>49.1</td>
</tr>
<tr>
<td>Race/Ethnicity</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>60.8</td>
</tr>
<tr>
<td>African American</td>
<td>16.4</td>
</tr>
<tr>
<td>Hispanic/Latina</td>
<td>15.0</td>
</tr>
<tr>
<td>Mixed/Other</td>
<td>7.9</td>
</tr>
<tr>
<td>Years of Education</td>
<td></td>
</tr>
<tr>
<td>&lt;High school</td>
<td>30.4</td>
</tr>
<tr>
<td>High school</td>
<td>36.9</td>
</tr>
<tr>
<td>&gt;High school</td>
<td>32.7</td>
</tr>
<tr>
<td>Childhood Sexual Abuse</td>
<td></td>
</tr>
<tr>
<td>40.2</td>
<td>.89**</td>
</tr>
<tr>
<td>Number of Days Cocaine/Stimulant Use</td>
<td>40.7</td>
</tr>
<tr>
<td>Number of Days Opiate Use</td>
<td>45.3</td>
</tr>
<tr>
<td>Interaction of Childhood Sexual Abuse and Number of Days Cocaine/Stimulant Use</td>
<td>1.03*** 1.025–1.039</td>
</tr>
<tr>
<td>Interaction of Childhood Sexual Abuse &amp; Number of Days Opiate Use</td>
<td>.97*** 0.961–0.975</td>
</tr>
</tbody>
</table>

AOR = adjusted odds ratio; CI = confidence interval.
*p < .05. **p < .01. ***p < .001.
risk behavior among women enrolled in methadone maintenance programs. The rates of continued cocaine/stimulant and opiate use found in this study are consistent with other studies of methadone maintained samples in community treatment programs (15, 30). As expected, high rates of CSA were found among the sample.

Previous research indicates that women who have experienced CSA are more likely to have unprotected sex than women without a CSA history. Substance abuse, particularly cocaine use, is also linked to increased unprotected sex. Findings of the current investigation indicate complicated interactions between these two risk factors. As hypothesized, there was a significant interaction between 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 emerged.

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 significantly associated with an increase in USOs. 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 significant 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 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. Considering why and how traumatized women use various substances may be important in understanding these findings. One relevant factor may be the long-term sequelea of CSA. It is well documented that women with sexual abuse histories often struggle with pervasive sexual problems in adulthood (31). These difficulties can take many forms. Whereas some women report little sexual desire and avoid sexual relationships, others report a compulsive desire for sexual contact and are likely to engage in multiple, short-term sexual relationships (32, 33). Importantly, these sexual behaviors are not necessarily mutually exclusive. Both sexual avoidance and impulsive sexual behavior are characterized as mechanisms used by trauma survivors to avoid 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 (34). Though these various avoidance strategies may work in the short-term to decrease distress, ultimately they exacerbate sexual problems (35).

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 to 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. 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, and drawn from a multisite 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.

TABLE 2

<table>
<thead>
<tr>
<th>Childhood Sexual Abuse History</th>
<th>AOR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Days of cocaine/stimulants use (past 30 days)</td>
<td>1.03***</td>
<td>1.020–1.030</td>
</tr>
<tr>
<td>Days of opiate use (past 30 days)</td>
<td>.99***</td>
<td>.980–.992</td>
</tr>
<tr>
<td>No Childhood Sexual Abuse History</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Days of cocaine/stimulants use (past 30 days)</td>
<td>.99**</td>
<td>.988–.998</td>
</tr>
<tr>
<td>Days of opiate use (past 30 days)</td>
<td>1.02***</td>
<td>1.015–1.023</td>
</tr>
</tbody>
</table>

Odds ratios express increment in risk for a change in unprotected sexual occasions for every one-day change in substance use. AOR = adjusted odds ratio; CI = confidence interval.

***p < .01. ** p < .001.
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 nonmethadone samples of substance abusing women, to women not currently in drug treatment or to women not willing or eligible to participate in a prevention intervention study. Reliance on self-report measures is another limitation. Asking about sexual abuse history requires participants to recall events that occurred during childhood. However, findings from several studies have indicated accuracy in retrospective reports of childhood victimization and good discriminant validity with the main limitation being underreporting (36). CSA was defined in a general way and could have been interpreted differently by respondents. Providing 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 post-traumatic stress disorder (PTSD). Unfortunately PTSD was not assessed in this study. Finally, the cross-sectional study design does not allow for causal conclusions or examination of patterns over time.

Implications and Future Directions

Findings indicate that there are high levels of women reporting CSA in methadone programs, and that the relationship between CSA and unprotected sex differs depending on drug type and frequency. Women with CSA using cocaine are at particularly high risk for having unprotected sex, suggesting that this group of women be specifically targeted for risk reduction interventions. More research is needed to untangle the complex relationships between CSA, 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 integral component for management of sexual risk. Given that sexual behavior of CSA survivors can take many forms, it is also important to assess individual differences.

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Declaration of Interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

REFERENCES


