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## Substance Use During Sexual and Physical Assault in HIV-Infected Persons

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### Abstract

We used data from the HIV-Alcohol Longitudinal Cohort to determine the prevalence of substance use by victims and assailants during physical and sexual assault against HIV-infected persons, and to determine if the findings differed by gender. Of the sexually assaulted participants, 31% of victims and 70% of assailant(s) had used drugs/alcohol during sexual assault. Compared with men, women had higher odds of substance use during sexual assault (adjusted OR 3.8, 95% CI 1.6–8.7) and of substance use by their assailant(s) during sexual assault (adjusted OR 5.9, 95% CI 1.7–20.6) in adjusted analysis. Of the physically assaulted participants, 66% of victims and 85% of assailants used drugs/alcohol during physical assault; these results did not differ by gender.

### Keywords

alcohol use; drug use; violence; victims; abuse

### Introduction

The association of substance use with violence has been well established. High rates of chronic drug and alcohol abuse have been described among both assailants and victims of violent crimes, sexual assault, and intimate partner violence (Abbey, Zawacki, Buck, Clinton, & McAuslan, 2001; Chermack & Blow, 2002; Cunradi, Caetano, Clark, & Schafer, 1999; Cunradi, Caetano, & Schafer, 2002; Kilpatrick, Acierno, Resnick, Saunders, & Best, 1997; Lown & Vega, 2001; Rivara et al., 1997; Sharps, Campbell, Campbell, Gary, & Webster, 2001; Zavala & French, 2003). Other work has also shown that assailants and victims of sexual and physical violence are often substance using at the time of the event (Caetano, Schafer, & Cunradi, 2001; Chermack & Blow, 2002; Kantor & Straus, 1989; Mohler-Kuo, Dowdall, Koss, & Wechsler, 2004; Thompson & Kingree, 2004). In fact, one

review estimated that 45% of intimate partner violence perpetrated by men involved alcohol (Roizen J, 1993). However, the role of substance use during violence experienced by HIV-infected groups, and how it is affected by gender of the victim, has not been well described.

Violence among those with HIV and at risk for HIV may be even greater than among the general population (Bedimo, Kissinger, & Bessinger, 1997; Cohen et al., 2000; McDonnell, Gielen, & O'Campo, 2003; Vlahov et al., 1998; Zierler et al., 2000). Sixty-six percent of HIV-infected women in one cohort reported a history of assault, with 21% having been victimized in the past year, and 31% reporting a history of sexual assault prior to age 18 (Cohen et al., 2000). Another study of HIV-infected women found that 32% had a history of sexual assault during their lifetime (Bedimo et al., 1997). Although less is known about the prevalence of abuse among HIV-infected men, it appears that they are commonly victims of violence as well. Data from the HIV Costs and Service Utilization Study revealed that 20.5% of women, 11.5% of men having sex with men, and 7.5% of heterosexual men reported physical harm since HIV diagnosis, nearly half of whom reported HIV as the cause of violence (Zierler et al., 2000). This is highly concerning given the association that victimization has with several negative health measures in cross-sectional studies of HIV-infected persons. For example, victimization has been associated with increased medical disease, health care utilization, and substance use characteristics (Eisenman, Cunningham, Zierler, Nakazono, & Shapiro, 2003; Liebschutz, Feinman, Sullivan, Stein, & Samet, 2000). Additionally, sexual victimization has been associated with high-risk sexual behavior in HIV-infected persons (Bogart et al., 2005; Chuang, Liebschutz, Horton, & Samet, 2006). These findings further emphasize the need to better characterize violence against HIV-infected persons.

The pathway through which substance use contributes to violence is likely multifold, and perhaps different from one situation to another. For example, some assailants may have the desire to commit sexual assault, and that desire also leads them to drink alcohol. Alcohol use could then be a consequence rather than a cause for the assault. Conversely, alcohol use may actually be the facilitator to violence, which is supported by the hypothesized proximal role of substance use in violent acts (Fals-Stewart, Golden, & Schumacher, 2003). In these situations, alcohol may affect cognitive ability and reduce inhibitions that ultimately lead to assault. Another contributing factor may be the social situations in which violence occurs; for example, certain situations may encourage both drinking and sexual assault, such as bars or parties (Abbey et al., 2001).

Since HIV-infected groups may be more at risk for both chronic substance use (Bing et al., 2001; Cook et al., 2001; Galvan et al., 2002; Samet, Phillips, Horton, Traphagen, & Freedberg, 2004) and violence victimization (Bedimo et al., 1997; Cohen et al., 2000; McDonnell et al., 2003), we hypothesize that they may be particularly susceptible to substance-involved acts of violence during their lifetimes. Little is known about the role of acute intoxication during violence experienced in the lives of HIV-infected individuals. One study found that victims of violence who were HIV-infected women were more likely to report using alcohol before or during a violent episode than HIV-negative women (McDonnell et al., 2003). Research in this area has focused on female victims of substance-involved assault, but men are likely at risk as well. Although women are more likely to be victims of assault in the context of intimate relationships, men are overall more often the victims of physical violence (Craven D, 1997). Interestingly one study found that incident specific alcohol use by perpetrators was more common during intimate partner violence against women than against men (Thompson & Kingree, 2004). Conversely, another study found that men were more likely than women to have been drinking during the violent episode, independent of whether the man was the perpetrator or the victim (Caetano et al., 2001). The present study uses the baseline cross-sectional data from the HIV-ALC (HIV-

Alcohol Longitudinal Cohort) study, a cohort of HIV-infected persons with a lifetime history of alcohol problems. In this cohort, 81% of the participants had experienced physical or sexual violence in their lifetime, and 40% of the participants experienced physical or sexual violence at some time during the 3-year follow-up period (Liebschutz, Geier, Horton, Chuang, & Samet, 2005). Our objective was to describe the prevalence of substance use by both assailants and victims during lifetime violence using data collected at the baseline time point and to observe whether the results differed by gender of the victim.

## Materials and Methods

### Study design & participant recruitment

The HIV-ALC (HIV-Alcohol Longitudinal Cohort) study recruited HIV-infected individuals with a history of alcohol problems with the primary aim of evaluating the effect of alcohol use on HIV progression (Samet, Horton, Traphagen, Lyon, & Freedberg, 2003). The current study is a cross-sectional analysis using the baseline data of subsamples of this cohort who reported experiencing either sexual or physical assault. The Institutional Review Boards of Boston Medical Center and Beth Israel Deaconess Medical Center approved this study. Patients were recruited principally from the Boston Medical Center HIV Diagnostic Evaluation Unit (Samet et al., 1995), a weekly clinic for engaging HIV-infected persons into medical care. Participants were also recruited from other sites: the Beth Israel Deaconess Medical Center, a respite facility for homeless persons, a methadone clinic, Boston Medical Center's primary care practices, referrals by friends, and through posted flyers at homeless shelters and HIV/AIDS social service agencies in the Boston area.

Eligibility criteria were confirmed HIV infection, a lifetime history of alcohol problems (defined as 2 positive responses to the CAGE questionnaire (Ewing, 1984)), and age 18 years. Those patients recruited from the Boston Medical Center HIV Diagnostic Evaluation Unit who did not meet CAGE criteria were eligible if one of two attending physicians made a specific diagnosis of alcohol abuse or dependence. Other inclusion criteria were fluency in English or Spanish, Mini-Mental State Examination score 21 (Folstein, Folstein, & McHugh, 1975), and no plans to move residence from the Boston area for the next 2 years. Recruitment ran from June 1997 to July 2001. Informed consent was obtained from subjects who met the eligibility criteria and agreed to participate in the study.

A trained research associate administered structured in-person confidential interviews in English or Spanish. For the measures used in this analysis, the Spanish items were created by translating from English, then back translating to check for accuracy, and corrected. Most interviews were performed at the General Clinical Research Center of the Boston University School of Medicine.

### Definition of Variables

Data collected included demographics (age, sex, race/ethnicity, education, marital status, homelessness), interpersonal violence exposure, alcohol and drug use, and HIV transmission category. Homelessness was defined as at least one night in a shelter or on the street in the past 6 months. Alcohol use in the past 30 days was categorized as hazardous, moderate, or abstinent. These categories were derived from the NIAAA definition for hazardous use (>14 drinks/week for men <66 years old and >7 drinks/week for men 66 years old and all women, or 5 drinks on one occasion for men <66 years old and 4 drinks on one occasion for men 66 years old and all women). Moderate alcohol use was defined as any drinking less than hazardous (National Institute of Alcohol Abuse and Alcoholism).

The questions used to assess violence exposure were adapted from a previous study designed to describe interpersonal violence among persons with a history of substance abuse

(Liebschutz et al., 2002). To assess for sexual violence, the subjects were asked, "Have you ever been sexually assaulted (for example: unwanted sexual touching anywhere on your body, touching of genitals and/or breasts, or made to have oral sex or vaginal or anal intercourse against your will by force or the threat of force)?" If an assault history was reported, the participants were asked whether they were using alcohol or drugs when they were assaulted. Response categories were "never," "some cases," "most cases," or "all cases." The outcome variable created to represent substance use during assault was dichotomous (never vs. at least some cases). Participants were then asked whether the person who assaulted them was using alcohol or drugs when they were assaulted, using the same response categories and outcome variable. To assess for a history of physical assault, the participants were asked, "Have you ever been physically abused or assaulted (for example: kicked, hit, choked, shot, stabbed, burned, or held at gunpoint)?" If a history of physical assault was reported, subjects were asked whether they or their assailants were using drugs or alcohol at the time of physical assault, in the same manner as for sexual assault. For each type of assault reported (sexual or physical), participants were asked their age at first victimization, and whether the assailant(s) were stranger(s), non-stranger(s), or both.

### Statistical Analysis

Statistical analysis was performed using SAS/STAT v.8.2 (SAS Institute Inc., Cary, N.C., 2001). The data analysis for this study was restricted to the subgroups of participants who reported a history of sexual or physical assault. Descriptive data for demographic and substance use characteristics are presented by assault history and gender. The proportion of assault victims and assailants with a history of substance use during sexual and physical assault is reported. The odds of substance use by the victim and the assailant during both sexual and physical assault was then compared by gender using logistic regression modeling, adjusting for age (continuous), race (White vs. non-White), and the victim-assailant relationship (stranger, non-stranger, or both). For all analyses, 2-tailed tests were performed using  $p < 0.05$  as criterion for statistical significance.

Childhood sexual assault and childhood physical assault (occurring prior to age 13) were considered as potential confounders in the analyses of substance abuse during assault but were excluded from the final logistic regression models due to potential collinearity with victim-assailant relationship (i.e. participants reporting childhood assault were significantly more likely to report non-stranger assailants than those not reporting childhood assault). In subsequent analysis, the childhood assault variables were assessed as potential confounders in regression models that did not include the victim-assailant relationship variable. In this analysis the primary relationship of gender with substance use during assault was not confounded by a history of childhood assault.

### Results

The HIV-ALC cohort (N=349) was recruited from the following locations: 56% from the Boston Medical Center HIV Diagnostic Evaluation Unit; 16% from posted flyers; 13% from Boston Medical Center's primary care practices, 5% from a respite facility for homeless persons; 4% from a methadone clinic; 4% from friend referrals; and 2% from the Beth Israel Deaconess Medical Center. Most study subjects [313/349 (90%)] met the eligibility criteria of 2 positive responses to the CAGE questionnaire (Ewing, 1984), the remainder qualified on the basis of clinical assessment [36/349 (10%)]. The majority of the participants completed the interviews in English, while 26 (3%) completed the interview in Spanish.

## Participant characteristics

Eighty-one percent of the cohort (281/349) had experienced either sexual and/or physical assault in their lifetime, with 139 (40%) reporting a history of sexual assault and 266 (76%) reporting a history of physical assault. The sexual and physical assault groups were not mutually exclusive, since more than one-third of the participants experienced both sexual and physical assault (36%). All subsequent analysis is restricted to subjects reporting some type of assault. Characteristics of the participants who experienced either sexual assault or physical assault with comparisons by gender are shown in Table 1. Among those reporting a lifetime history of sexual assault, the men were more likely to have used alcohol in the past 30 days, but less likely to have used heroin in the past 30 days than the women. Men reporting a lifetime history of physical assault were older, more likely to be homeless, more likely to have consumed alcohol in the past 30 days, but less likely to have used heroin in the past 30 days than women. Childhood assault was very common, with 63% of sexual assault victims and 47% of physical assault victims reporting first assault prior to age 13.

## Substance use during sexual assault

Data concerning substance use during sexual assault is shown in Table 2. Of the 139 subjects who had been sexually assaulted, 31% (95% CI 23%–39%) reported they used drugs or alcohol during at least some cases of sexual assault, and 70% (95% CI 64%–76%) reported their assailant had used drugs or alcohol during at least some cases of sexual assault. Gender differences were clinically and statistically significant. Female sexual assault victims were significantly more likely than male sexual assault victims to report substance use during sexual assault (51% vs. 19%, adjusted OR 3.8, 95% CI 1.6–8.7), adjusting for age, race/ethnicity, and victim-assailant relationship. Substance use by the assailant during sexual assault was also reported significantly more often by female victims (88% vs. 58%, adjusted OR 5.9, 95% CI 1.7–20.6) in the adjusted analysis.

## Substance use during physical assault

Data concerning substance use during physical assault is also shown in Table 2. Of the 266 subjects who had been physically assaulted, 66% (95% CI 60%–72%) reported they had used drugs or alcohol during at least some cases of physical assault, and 85% (95% CI 81%–89%) reported their assailant had used drugs or alcohol during at least some cases of physical assault. The odds of substance use by either the subject or the assailant was similar for men and women.

## Discussion

Substance use during assault by both HIV-infected victims and their assailants was high in this cohort of HIV-infected persons with a history of alcohol problems. In fact, the majority of the assault victims reported that their assailants were substance using during both physical and sexual assault. Similarly, a large number of participants reported that they themselves were substance using when they were victimized, particularly during physical assault.

Compared with men, women experiencing sexual assault were significantly more likely to report substance use by both themselves and their assailants. The reasons for this are unclear. We initially hypothesized that men who experienced sexual assault may be more likely to have been victimized as children exclusively, when they would be less likely to be substance using. However, in a separate analysis looking only at the participants who experienced sexual assault after childhood (age > 13), we found that women victims were still significantly more likely to report substance use during sexual assault than men victims (63% vs. 36%, adjusted OR 4.22, 95% CI 1.05–16.95). Women were also still more likely than men to report substance use by their assailants among those only experiencing sexual

assault after childhood (88% vs. 59%, unadjusted OR 5.25, 95% CI 0.90–30.62) compared with the full sample (88% vs. 58%, unadjusted OR 5.39, 95% CI 1.67–17.42); this difference was no longer statistically significant, likely due to the smaller sample size. Note that the adjusted OR for the full sample was 5.88 (95% CI 1.68–20.58) but we were unable to run an adjusted model for those experience sexual assault after childhood due to a limited number of events. An alternative explanation to the gender findings is the possibility that the social situations around which sexual assault occurs differ for men and women. Women may be more likely fall victim to sexual assault when they are in social situations that encourage both drinking and sexual pursuit, like bars or parties (Abbey et al., 2001), and perhaps the environments for victimization of men differ. Additionally, whether differences exist in the social situations and environments that lead to intimate partner violence against men who have sex with men versus heterosexual men is unclear from our study. Further investigation of these issues is needed to elucidate the relationship of substance use and violence against HIV-infected men.

We were interested in whether a history of childhood assault would bias the study findings. Since childhood sexual abuse victims are more susceptible to both increased substance use and violence victimization in adulthood (Bartholow et al., 1994; DiIorio, Hartwell, & Hansen, 2002; Johnsen & Harlow, 1996; Wingood & DiClemente, 1997), we hypothesized that they would be more susceptible to substance involved violence experienced in adulthood. However, the limited data collected on childhood assault did not allow us to fully address this hypothesis; whether a participant had experienced assault during childhood only or in adulthood as well could not be distinguished. In this sample, childhood sexual assault was found to be negatively associated with substance use by the victim during sexual assault. We suspect that this finding was driven by participants who experienced sexual assault during childhood only, when substance use by the victim would be less likely. As described previously, collinearity between childhood assault and the victim-assailant relationship variable did not allow us to assess the effects of both variables simultaneously and led to exclusion of the childhood assault variable from the final analysis. However, the primary relationship of gender with substance use during assault was not modified when the childhood assault variable was assessed in regression models that did not include the victim-assailant relationship variable.

This study has certain limitations. There is potential for recall and reporting bias with self-report of sensitive data that reflects a lifetime experience. The topics being recalled, however, concerned very important life events, which are not likely to be forgotten. In addition, the interviews were performed confidentially by staff trained to facilitate patient comfort in order to minimize the potential for inaccurate reporting. Since only the victims were interviewed, we relied on the victims' perceptions of whether their assailants' were substance using during the episodes. Another limitation is the limited data collected in the survey instrument on victimization. The terminology of the questions and the limited questions on assault may have resulted in underreporting. However, unless the degree of underreporting differed by gender, it would not bias estimates of the association between gender and substance use during assault. An additional limitation of the data was that detail was not obtained regarding recurrent episodes of violence throughout the lifetime, which could involve different assailants and different relationships. Future exploration about the social contexts where substance involved violence occurs will help clarify these issues. Additionally, since lifetime experience of violence was measured, it is not possible to distinguish whether violence occurred prior to or after HIV infection.

HIV-infected persons have high prevalence of lifetime violence, which has been shown to negatively impact their physical and mental health status. This study demonstrated that substance use by both the victim and the assailant during cases of physical and sexual

assault is very common in this HIV-infected sample. Furthermore, women were at even higher risk than men for substance involved sexual assault. The reasons for these differences need to be further investigated. Whether these episodes of violence are occurring prior to or after HIV diagnosis is also deserving of further study. Such information can help guide the incorporation of violence prevention into substance abuse treatment programs aimed at HIV-infected individuals. Education about the risks of violence, techniques to avoid situations that could potentially lead to violence, as well as screening for violence and its sequelae are important issues in the substance abuse management of HIV-infected individuals.

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**Table 1**

Characteristics of the HIV-Alcohol Longitudinal Cohort Participants with Lifetime Histories of Sexual and Physical Victimization

Characteristic	Victims of Sexual Assault <sup>I</sup> (n=139)		Victims of Physical Assault <sup>I</sup> (n=266)	
	Men N=86	Women N=53	Men N=206	Women N=60
Age—mean in years (SD)	39(7)	38(7)	41(7) <sup>*</sup>	38(7) <sup>*</sup>
High school education or more—no. (%)	53(62)	33(62)	121(59)	38(63)
Married—no. (%)	7(8)	6(11)	14(7)	8(13)
Homeless—no. (%)	22(26)	10(19)	65(32) <sup>*</sup>	8(13) <sup>*</sup>
Race—no. (%)				
Black	33(38)	26(49)	80(39)	31(52)
White	34(40)	17(32)	78(38)	18(30)
Hispanic	18(21)	9(17)	47(23)	10(17)
Other	1(1)	1(2)	1(0.5)	1(2)
HIV transmission risk category <sup>**</sup> —no. (%)				
Heterosexual	8(9)	22(42)	30(15)	27(45)
Injection drug use	41(48)	31(58)	127(62)	33(55)
Men who have sex with men (MSM)	37(43)	N/A	49(24)	N/A
Alcohol use in past 30 days—no. (%)				
Abstinent	50(58) <sup>*</sup>	41(77) <sup>*</sup>	116(56) <sup>*</sup>	44(73) <sup>*</sup>
Moderate	11(13) <sup>*</sup>	1(2) <sup>*</sup>	24(12) <sup>*</sup>	1(2) <sup>*</sup>
Hazardous	25(29) <sup>*</sup>	11(21) <sup>*</sup>	66(32) <sup>*</sup>	15(25) <sup>*</sup>
Any cocaine use in past 30 days—no. (%)	25(29)	10(19)	51(25)	10(17)
Any heroin use in past 30 days—no. (%)	2(2) <sup>*</sup>	8(15) <sup>*</sup>	14(7) <sup>*</sup>	10(17) <sup>*</sup>
First assault occurring prior to age 13	60(70)	28(54)	98(49)	26(46)

<sup>I</sup>Sexual assault and physical assault groups are not mutually exclusive.

<sup>\*</sup>p<0.05 comparing men and women

<sup>\*\*</sup>HIV transmission risk category was not compared by gender due to the differences in categories

**Table 2**

Frequency of Substance Use by Victims and Assaultants During Sexual and Physical Assault Against HIV-Infected Persons and Logistic Regression Analysis Results of the Association between Substance Use and Gender

	Total	Men	Women	Adjusted OR <sup>a</sup> (95% CI)
Substance use during sexual assault (N=139):				
By victim	31%	19%	51%	3.79 (1.64–8.72)
By assailant	70%	58%	88%	5.88 (1.68–20.58)
Substance use during physical assault (N=266):				
By victim	66%	66%	65%	1.07 (0.55–2.07)
By assailant	85%	83%	89%	1.80 (0.59–5.50)

<sup>a</sup>Odds ratio of substance use during assault for women compared with men, controlling for age, race, and victim-assailant relationship.