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Association of Violence Victimization with Inconsistent Condom Use in HIV-Infected Persons

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Abstract

The association of violence victimization with current condom use in HIV-infected persons was examined in this cross-sectional study. The HIV—Alcohol Longitudinal Cohort (HIV-ALC) recruited HIV-infected participants with a history of alcohol problems. Interviews assessed violence histories and current sexual behaviors. Of the 349 participants (79% men), 38% reported inconsistent condom use and 80% reported a violence history. Lifetime sexual violence was reported by 40% and lifetime physical violence (without sexual violence) by 40%. Participants reporting lifetime sexual violence had greater odds of inconsistent condom use than participants without any history of violence. A history of childhood sexual violence was also associated with greater odds of inconsistent condom use than participants without a history of childhood sexual violence. A history of sexual violence may in part explain HIV-infected persons' greater risk for transmitting HIV through high-risk sexual behaviors.

Keywords

HIV; violence; risk behavior; condom use

INTRODUCTION

Sexual contact is currently the most common mode of HIV transmission in the U.S. and worldwide (Centers for Disease Control and Prevention [CDC], 2001). Although many HIV-infected persons substantially change their sexual practices after HIV diagnosis to reduce transmission risk (Metsch *et al.*, 1998), others continue to engage in unsafe sexual contact putting their partners at risk for disease (Erbelding *et al.*, 2000; Kalichman *et al.*, 2002;

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Kwiatkowski and Booth, 1998; Marks *et al.*, 1999). Prevention efforts have largely targeted HIV-negative populations deemed at high risk for acquiring HIV. Although these efforts are successful at reducing risky sexual behaviors (Kamb *et al.*, 1998; National Institute of Mental Health [NIMH] Multi-site HIV Prevention Trial Group, 1998) and should continue, targeting HIV-infected populations about the continued risks of transmitting disease is increasingly being emphasized (CDC, 2003). Recognizing predictors of high-risk sexual practices among the HIV-infected is a step toward understanding the chain of events that may lead to putting sexual partners at risk for infection. This study investigated the association of a history of physical or sexual violence with inconsistent condom use in an HIV-infected cohort with a history of alcohol problems.

The association of a personal history of violence with high-risk sexual behavior among populations at increased risk for HIV infection has been described (Cohen *et al.*, 2000; DiIorio *et al.*, 2002; El-Bassel *et al.*, 2001; Hamburger *et al.*, 2004; Hillis *et al.*, 2001; Lenderking *et al.*, 1997; Mullings *et al.*, 2000; NIMH HIV Prevention Trial Group, 2001; Parillo *et al.*, 2001; Paul *et al.*, 2001). These studies show that violence is associated with sexual risk behaviors that increase the risk of acquiring STDs, including HIV. Extending this finding to HIV-infected populations, one could hypothesize that a history of violence is associated with sexual risk taking and transmission of the virus even after HIV diagnosis and knowledge of infectivity. In a cross-sectional analysis of HIV-infected men who have sex with men (MSM), O'Leary *et al.* (2003) report a significant association between a history of childhood sexual violence and unprotected anal sex in the previous 90 days with partners of HIV-negative or unknown serostatus.

Physical and sexual violence is very common; it is estimated that 25% of U.S. women have been victimized during their lifetime, with 1.5% having been abused within the past year (Tjaden and Thoennes, 2000). However, the prevalence of violence among the HIV-infected is even more alarming (Bedimo *et al.*, 1997; Cohen *et al.*, 2000). Sixty-six percent of HIV-infected women in one cohort reported a history of violence, with 21% having been victimized in the past year, and 31% reporting a history of sexual violence prior to age 18 (Cohen *et al.*, 2000). Another study of HIV-infected women found that 32% had a history of sexual violence during their lifetime (Bedimo *et al.*, 1997). The study of physical and sexual violence among HIV-infected men has been limited.

Previous research has described high prevalence of inconsistent condom use among HIV-infected men and women of all transmission risk categories with a lifetime history of alcohol problems (Ehrensstein *et al.*, 2004). The current study examined whether inconsistent condom use was associated with a history of physical or sexual violence. It is known that sexual violence is associated with sexual risk behavior among populations at risk for HIV; this study examines whether this association is also true among individuals aware of their HIV infection.

METHODS

Participant Recruitment

The HIV—Alcohol Longitudinal Cohort (HIV-ALC) 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 *et al.*, 2003). The current study is a cross-sectional analysis using the baseline data of the 349 participants of the HIV-ALC 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.

Participants were eligible for enrollment if they had confirmed HIV infection, a lifetime history of alcohol problems (defined as 2 positive responses to the CAGE questionnaire (Ewing, 1984), and were 18 years of age. 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 (Folstein *et al.*, 1975) score 21, and likelihood of residence in the Boston area for the next 2 years. Recruitment began in June 1997 and ended in July 2001.

Data Collection and Survey Instrument

All participants were interviewed in-person by a research associate in a private room using a standardized instrument. The instrument included items on demographics, exposure to interpersonal violence, alcohol and drug use, depressive symptoms, HIV transmission risk category, and sexual behaviors. The questions used to assess violence histories were adapted from a previous study designed to describe interpersonal violence among persons with a history of substance abuse (Liebschutz *et al.*, 2002). Alcohol and drug severity and consumption were measured using both quantity and frequency questions assessing the prior 30 days and the Addiction Severity Index, which has documented reliability and validity (McLellan *et al.*, 1985). Depressive symptoms were measured by the 20-item Centers for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977). This scale identifies depressive symptoms over the past week. Items assessing sexual risk behaviors over the past 6 months were derived from the Risk Assessment Battery (Navaline *et al.*, 1994). Interviews were conducted in either English or Spanish. For the measures used in this analysis, the Spanish version was created by translating the questions to Spanish and then back translated to check for accuracy.

Definition of Violence Variables

To assess for physical violence, the participants were asked, "Have you ever been physically abused or assaulted (for example: kicked, hit, choked, shot, stabbed, burned, or held at gunpoint)?" To assess for sexual violence, the participants 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 a violence history was reported, participants were asked their age at the time of the first episode.

Two violence variables were created for these analyses: lifetime violence and childhood sexual violence. The lifetime violence variable was created to define violence experienced at any age. A participant’s lifetime violence variable was then categorized into one of three groups: no violence history, a sexual violence history (with or without physical violence), or a physical violence history alone (without sexual violence). Most persons reporting sexual violence also reported physical violence, so it was not possible to truly isolate these two types of violence. The three categories were chosen for the lifetime violence variable because they were felt to best describe a person’s violence experience. The childhood sexual violence variable was dichotomous, defined as the report of sexual violence occurring prior to age 13.

Definition of Inconsistent Condom Use

Participants were asked about their current sexual practices. Inconsistent condom use was defined as not using condoms at all sexual encounters in the past 6 months. Consistent condom use was defined as using condoms at all sexual encounters or not having sex in the past 6 months. During the interviews, sex was defined as any vaginal intercourse, anal intercourse or oral sex.

Definition of Covariates

Covariates that have previously been shown to be associated with sexual risk taking or had clinical face validity were chosen. Covariates used were sex, age, education ($\pm$ high school graduation), marital status (married vs. not married), homelessness, race/ethnicity (Black, White, other), CES-D score coded as a continuous variable ranging from 0 to 60 with higher scores indicating more depressive symptoms (Radloff, 1977), HIV transmission risk category (heterosexual, injection drug use, MSM), alcohol use in the past 30 days, any cocaine use in the past 30 days, any heroin use in the past 30 days, and current antiretroviral use. 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 based on >14 drinks/week for men and >7 drinks/week for women, or >3 drinks on one occasion for men and >2 drinks on one occasion for women. Moderate alcohol use was defined as any drinking less than hazardous.

Statistical Analysis

Using chi-square tests for categorical variables and t tests for continuous variables, characteristics of participants currently engaging in inconsistent condom use were compared with participants without inconsistent condom use or not sexually active in the past 6 months. Unadjusted and adjusted logistic regression models were used to analyze the relationship between the victimization variables (lifetime violence and childhood sexual violence) and inconsistent condom use. Adjusted logistic regression models controlled for the following covariates: sex, age, education, marital status, homelessness, race/ethnicity,

CES-D score, HIV transmission risk category, alcohol use in the past 30 days, any cocaine use in the past 30 days, any heroin use in the past 30 days, and current antiretroviral use. For all analyses, two-tailed tests were performed using $p < .05$ as criterion for statistical significance.

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 participants [315/349 (90%)] met the eligibility criteria of at least two out of four positive responses to the CAGE questionnaire (Ewing, 1984); the remainder qualified on the basis of clinical assessment [34/349 (10%)].

Characteristics of the cohort are shown in Table I. The majority of the cohort was male and most participants described injection drug use as their risk factor for HIV transmission. The participants are compared by the condom use variable in Table I. Participants with inconsistent condom use were significantly more likely to have graduated high school and to have used alcohol, cocaine, or heroin in the past 30 days.

Eighty percent of the participants had experienced either physical and/or sexual violence at some point in their lives (40% physical violence only and 40% sexual violence with or without physical violence). Both women and men reported high prevalence of any lifetime history of violence (88% and 79%, respectively), but women were more likely to report a history of sexual violence than men (73% vs. 32%), $\chi^2(df = 1) = 40.2$, $p < .001$. Childhood sexual violence (prior to age 13) was reported by 26% of the cohort, with women more likely to have experienced childhood sexual violence than men (39% vs. 22%), $\chi^2(df = 1) = 8.5$, $p = .001$. Among the men, MSM and heterosexual men were both equally likely to report lifetime violence (82% and 77%, respectively), however MSM were more likely to have experienced sexual violence compared with heterosexual men (57% vs. 24%), $\chi^2(df = 1) = 25.3$, $p < .01$. MSM were also more likely to have experienced childhood sexual violence than heterosexual men (34% vs. 18%), $\chi^2(df = 1) = 6.90$, $p < .01$.

Separate unadjusted models examined the relationship of both violence variables with inconsistent condom use. In the unadjusted lifetime violence model, sexual violence was significantly associated with inconsistent condom use compared with those with no history of violence (OR = 2.42, 95% CI 1.29–4.53). Lifetime physical violence was not significantly associated with inconsistent condom use in the unadjusted model. Childhood sexual violence was significantly associated with inconsistent condom use compared with those without a history of childhood sexual violence (OR 2.14, 95% CI 1.31–3.51), in the unadjusted model.

Logistic regression analyses were performed to model the effect of violence victimization on inconsistent condom use, controlling for covariates. In the lifetime violence model, the magnitude of the association of sexual violence with inconsistent condom use remained

significant after controlling for covariates adjusted (OR = 2.88, 95% CI 1.39–5.96). Lifetime physical violence was not significantly associated with inconsistent condom use adjusted (OR = 1.39, 95% CI 0.69–2.79). Childhood sexual violence remained significantly associated with inconsistent condom use adjusted (OR = 2.25, 95% CI 1.31–3.89), in the multivariable analysis. Sex, age, race/ethnicity, education, marital status, homelessness, CES-D score, HIV transmission risk category, current alcohol, heroin, and antiretroviral use were not significant predictors of inconsistent condom use in either of the multivariable violence models. However, cocaine use in the past 30 days (adjusted OR = .54, 95% CI 1.28–5.03), lifetime violence (adjusted OR = 2.69, 95% CI 1.36–5.29), and childhood sexual violence predicted inconsistent condom use in both multivariable models.

DISCUSSION

Sexual violence, occurring either during childhood or at any age, was found to be significantly associated with currently engaging in inconsistent condom use in this cohort of HIV-infected persons with alcohol problems. Several findings in our study deserve emphasis. First, almost 40% of this HIV-infected cohort reported engaging in inconsistent condom use, putting their sexual partners at risk for infection. Secondly, the prevalence of lifetime violence in this cohort of HIV-infected persons was striking at 80%; this is higher than previously reported prevalences of 66–68% among HIV-infected women (Bedimo *et al.*, 1997; Cohen *et al.*, 2000). This finding may be due to the inclusion criteria of a history of alcohol problems in our sample, which has been associated with interpersonal violence (Jasinski *et al.*, 2000; Simpson and Miller, 2002). The finding of increased sexual risk taking associated with past sexual violence further defines characteristics of HIV-infected persons who may be at higher risk for transmitting the disease to their sexual contacts.

The association of violence with high-risk sexual behavior has been previously reported in one study of HIV-infected MSM (O’Leary *et al.*, 2003). This current study adds to existing literature in several ways. First, this cohort comprises HIV-infected men and women of all transmission risk categories, allowing study of the association of violence with current sexual behavior in a more heterogeneous sample. Second, it is relevant that these results were found in a cohort with a history of alcohol problems, because alcohol has been shown to increase sexual risk behavior and may interfere with efforts to improve inconsistent sexual behavior (NIMH Multisite HIV Prevention Trial Group, 2002). Third, the effect of various types of violence was studied. The outcome of inconsistent condom use was associated with lifetime sexual violence and childhood sexual violence, but not with lifetime physical violence.

Sexual violence has been associated with lower expectations for safe condom use, less assertiveness about birth control, and less assertiveness about refusing unwanted sex (Thompson *et al.*, 1997). The long-term consequences of sexual violence that increase the likelihood for risk taking are different than the long-term consequences of physical violence (Leonard and Follette, 2002; Loeb *et al.*, 2002), which could explain why no association between physical violence and inconsistent condom use was found. Although a person who has experienced any type of violence is more likely to experience more adverse medical and psychological consequences than individuals with no violence history (Collins *et al.*, 1999;

Liebschutz *et al.*, 1997; Martin *et al.*, 1999; Quinlivan and Evans, 2001; Rosenberg *et al.*, 2000; Wisner *et al.*, 1999), establishing specifically whether sexual violence occurred may further delineate risks for sexual transmission of HIV.

This study has certain limitations. Generalizability of these findings is limited because of the sampling methodology and the restriction to HIV-infected persons with alcohol problems. Also, there is the potential for recall and reporting bias with self-report of sensitive data. Other methods may yield higher reports of inconsistent behaviors, but would be unlikely to alter the direction of our findings (Newman *et al.*, 2002). The interviews, however, were performed confidentially by staff trained to facilitate patient comfort, in part an effort to minimize potential for inaccurate reporting. Another limitation is the inability to determine if the findings differed by gender. When stratified by gender, the sample sizes of the gender groups were too small to establish any significant associations in the main analyses. However, the distribution and prevalence of inconsistent condom use did not differ significantly by gender, therefore it is unlikely that gender is confounding the associations in the main analyses. Similarly, although the HIV-ALC survey did assess whether assault was perpetrated by strangers or by someone known to the victim, the sample sizes were too small to establish significant associations stratified in this way.

Another potential limitation in this study is in the way the outcome variable was defined. During the interviews, sex was defined as any vaginal intercourse, anal intercourse, or oral sex. Thus, behaviors of varying degrees of actual HIV transmission risk, such as unprotected anal intercourse and unprotected oral sex, were both categorized as inconsistent condom use. Also, the frequency of inconsistent condom use is unknown. The inconsistent condom use variable is therefore a heterogeneous one, with the actual risk of transmitting disease varying between individuals. Additionally, no information was collected on the serostatus of the participants' sexual partners. Although there is risk of transmitting resistant or more virulent strains to an already HIV-infected sexual partner, there obviously is only risk of seroconverting a sexual partner that is not HIV-infected. Therefore, the outcome of inconsistent condom use could overestimate the actual risk of transmitting a new HIV infection in certain situations.

Some HIV-infected persons are continuing to engage in inconsistent condom use, putting sexual partners at risk for acquiring disease. Both a history of lifetime sexual violence, and more specifically childhood sexual violence identified HIV-infected persons with recent inconsistent condom use in this study. Such information can inform clinical practice and the design of HIV prevention programs aimed at reducing risky sexual behaviors among HIV-infected persons. A history of sexual violence may identify a subgroup more at risk for engaging in risky sexual behaviors. In these populations, more detailed screening of risk behaviors, communicating prevention messages, discussing strategies for risk reduction, and reinforcing safer behaviors may be warranted. Similarly, how victims of sexual violence respond to HIV prevention programs aimed at reducing sexual risk behaviors will need further study. Such efforts will aid in development of strategies to encourage safer sexual behaviors among HIV-infected persons.

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Table I

Characteristics of HIV-Infected Persons with a History of Alcohol Problems Stratified by Consistency of Condom Use ($N = 349$)

Characteristic	Inconsistent condom use ^a , no. (%)	Consistent condom use or no sex ^b , no. (%)	Test statistic ^c
Male	98 (74)	178 (82)	3.01
Age (years), mean (<i>SD</i>)	40.1 (7.1)	40.9 (7.5)	0.98
Graduated high school	90 (68)	120 (55)	5.68 *
Married	10 (8)	17 (8)	0.008
Homeless	38 (29)	63 (29)	0.002
Race/ethnicity			3.94
Black	59 (45)	95 (44)	
White	50 (38)	66 (30)	
Other	23 (17)	56 (26)	
CES-D, mean score (<i>SD</i>)	23.5 (13.1)	21.8 (13.0)	-1.20
HIV transmission risk category			1.92
Heterosexual	30 (23)	48 (22)	
Injection drug use	72 (55)	133 (61)	
Men who have sex with men (MSM)	29 (22)	36 (17)	
Alcohol use in past 30 days			7.82 *
Abstinent	64 (48)	137 (63)	
Moderate	15 (11)	22 (10)	
Hazardous	53 (40)	58 (27)	
Any cocaine use in past 30 days	48 (36)	36 (17)	17.56 **
Any heroin use in past 30 days	21 (16)	16 (7)	6.31 *
Current antiretroviral use	72 (55)	133 (61)	1.54

^a $n = 132$.

^b $n = 217$.

^c Test statistics are expressed as t scores for continuous variables and χ^2 for categorical variables.

* $p < .05$.

** $p < .001$