



## Partner Violence and Condom Use in HIV-Discordant Heterosexual Partnerships

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### ABSTRACT

This paper examines the association between intimate partner violence and the consistency of condom use in a US urban cohort of HIV-serodiscordant couples. It uses both male and female data from the California Partners Study II of a lower-income ethnically mixed cohort of 145 such couples in the San Francisco Bay Area. We observed a significant association between inconsistent condom use and physical abuse: the risk of inconsistent condom use was double for those experiencing physical abuse (OR, 2.2; 95% CI, 1.1, 4.1). Injection drug use and a history of bisexual behavior were also associated with inconsistent condom use. Physical abuse tended to be reciprocal between partners (OR, 3.2; 95% CI, 1.9, 5.6). Our findings suggest that interventions effective in reducing intimate partner violence, and/or reducing the use of injection drugs in HIV-serodiscordant couples could lead to less transmission of HIV.

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**Running title:** Partner Violence and Condom Use in HIV-Discordant Heterosexual Partnerships

**Keywords:** intimate partner violence, HIV discordant couples, condom use

**Received :** Dec 02, 2012;

**Accepted :** Jul 15, 2014;

**Published :** Jun 01, 2015

## INTRODUCTION

Heterosexual transmission of human immunodeficiency virus (HIV) has steadily increased in the United States since the start of the epidemic [1]. In addition, many people infected with HIV in the United States are living longer as a result of more powerful anti-retroviral therapies (ARV), which became available in 1995. Therefore, more HIV-serodiscordant heterosexual relationships are likely to exist in the United States, for whom the importance of practicing safer sex is critical. Consistent condom use is a key component of practicing safer sex in such relationships [2]. Interventions that reduce the likelihood of inconsistent condom use could potentially save lives.

One factor influencing safer sex practices in general, and condom use in particular, is intimate partner violence (IPV). IPV, which includes physical, sexual and emotional abuse within intimate relationships [3], is a major public health problem that has received substantial attention in the medical literature in the last decade. One form of IPV, physical violence, has been associated with the practice of unsafe sex, a primary component of which is lack of condom use [4, 5]. The present study examines the association between physical violence, defined here as acts of violence or threats of violence, with the consistency of condom use in HIV-serodiscordant heterosexual couples. Socio-economic status, use of illegal drugs and alcohol are included in our analysis, as all three have been shown to be associated with both HIV infection and IPV in the United States [6].

We examine the relationship between recent physical violence and behaviors that increase the risk of HIV transmission among individuals in HIV-serodiscordant heterosexual partnerships in the California Partner's Study II. We conducted a cross-sectional analysis within this behavioral intervention trial. By using data from both the men and women in the partnerships, this study extends the previous work conducted on different populations, which has considered predominantly data collected from women.

## METHODS

### Study Population

The California Partner's Study II was a randomized behavioral risk reduction intervention trial. Sexually active HIV-serodiscordant heterosexual couples (n=145) in the San Francisco Bay Area were recruited between November 1996 and July 1999 by a variety of outreach methods. Details of the population selection

and study design have been described in previously published articles [7]. The University of California, San Francisco Committee on Human Research and University of California, Berkeley Institutional Review Board approved the protocol.

### Measures

For these analyses we considered baseline data from the California Partners' Study II. All participants were asked questions in face-to-face interviews at the baseline visit about IPV in their main relationship. The first two questions inquired about physical violence in the past six months: "How many times has your current partner physically hurt (shoved, hit, slapped or otherwise physically hurt) you in the past six months?" and "How many times has your current partner threatened to physically mistreat you in the past six months?" Study participants indicating one or more times to either question were coded as positive for physical violence. Our decision to combine actual physical violence and threats of physical violence into one variable, which we refer to as physical violence, was based on past research showing that partners who make threats of physical violence often carry out physically violent acts [8].

To assess sexual risk behavior, all participants were asked the following question separately, first about vaginal and then about anal sex: "How often have you used condoms during [this form of sex] in the last six months - never, less than half the time, about half the time, greater than half the time, or always?" The outcome variable "inconsistent condom use" was created by combining the two resulting variables on vaginal and anal sex, and was made into a dichotomous variable: "always use condoms during anal or vaginal sex" versus "less than always".

All participants were also asked to report the following information, which was then used to construct dichotomous variables: monogamous status as determined from reports of outside sexual partners in the past six months; employed in the last six months or not; level of education obtained; and ever traded sex for drugs, goods or money. The following variables were created: monogamy status (yes/no); graduated high school (yes/no); and sex work (yes/no). Race/ethnicity was categorized as African American, Caucasian, Hispanic/Latino, Asian, Native American, or mixed. Marital status (married to the current partner or not) was also included. Individuals reporting at least one sexual partner of the same sex in his or her lifetime were classified as having a history of bisexual behavior.

*(Continued on page 41)*

**Table I**  
**Baseline characteristics**  
**HIV-Discordant Heterosexual Couples in the San Francisco Bay Area (1996-1999) (n=290)**

	TOTAL (N)	<i>Female</i>	<i>Male</i>	<i>p-value</i>
HIV-positive	50%	50%	49%	0.81
Mean Age	40 years	38 years	41 years	
Married	33% 95	34%	32%	
Monogamous (past 6 months)	81% 236	81%	81%	1
Paid Job (past 6 months)	33% 95	32%	33%	0.9
Secondary Education and higher	80% 57	79%	81%	0.66
Sex Work	40% 117	51%	30%	0.0002
Bisexual Behavior	33% 97	39%	28%	0.06
Frequent Alcohol Use (past 6 months)	37% 107	30%	43%	0.02
Crack Cocaine Use (past 6 months)	42% 121	37%	46%	0.12
Injection Drug Use (past 6 months)	29% 84	25%	33%	0.12
Ethnicity				0.43
African American	39% 111	35%	43%	
Caucasian	36% 104	38%	35%	
Hispanic	9% 26	9%	9%	
Asian	1% 3	2%	0%	
Native American	1% 3	1%	1%	
Other	14% 39	14%	13%	
Inconsistent Condom Use (past 6 months)	54% 159	53%	55%	0.72
Physical violence by partner (past 6 months)	29% 82	30%	27%	0.6

\*p-values based on chi-square tests

The number of sex acts in the last six months (vaginal and anal) was converted to the log of this response in order to accommodate outliers. Substance use was assessed over the previous six months and was classified as: frequent alcohol use (defined as consumption of more than two glasses of alcohol at least twice a week); crack use (yes/no); and injection drug use (yes/no).

In addition to these variables obtained from reports of the individuals, three variables were created from reports of partners to measure if an individual's partner was using crack; using injection drugs; reported intimate physical violence.

### Analytic Methods

Baseline characteristics of the study population were examined by descriptive summaries of key variables, both for all participants combined and separately by partner's biological sex. Differences

between male and female partners were evaluated using chi-square analysis. Subsequent analyses for these two associations were based on logistic regression models, controlling for potentially confounding variables.

Candidate confounder variables included HIV serostatus; gender; age as a continuous variable; race/ethnicity; gender of the HIV-positive partner; employment status; education; marital status; monogamy; frequency of sex, sex work; bisexual behavior; frequent alcohol use; crack use; and injection drug use. The final regression model included only variables that were independently associated ( $p \leq .05$ ) with the outcome variable except gender and the log of frequency of sex, which were included in all the models in order to adjust for the effects of these variables. Both members of each partnership were included in regression models. Potential dependence between outcomes within couples were accounted for using generalized estimating equations [9].

SAS version 8.2 was used to examine education. Of this study population 33% reported fre-

**Table II**

**Between-partner associations of drug use, physical violence (i.e., threats or of physical violence)**

**HIV-Discordant Heterosexual Couples in the San Francisco Bay Area (1996-1999)**

	N	Unadjusted OR	95% Confidence Intervals
Physical abuse by both partners	38	3.2	1.9 – 5.6
Crack use reported by both partners	90	12.9	7.4 – 22.7
Injection drug use by both partners	66	38.3	18.8-78.0

**Table III**

**Analyses of characteristics associated with inconsistent condom use. Physical abuse (threats of/physical violence) is included in this model\* HIV-Discordant Heterosexual Couples in the San Francisco Bay Area (1996-1999)**

	Unadjusted Odds Ratios (95% Confidence Intervals)	Adjusted Odds Ratios (95% Confidence Intervals)
Positive HIV serostatus	1.1(0.7--1.8)	
Gender	0.9 (0.6--1.5)	1.1 (0.8--1.4)
Married	1.3 (0.8--2.2)	0
Monogamous	1.4(0.8--2.5)	--
Paid Job	1.9 (1.2--3.1)	--
Secondary Education	1.5 (0.8--2.8)	--
Sex Work	1.6 (1.0--2.6)	--
Bisexual Behavior	2.0 (1.2--3.3)	3.0 (1.3--4.0)
Frequent Alcohol Use	2.0 (0.9--2.4)	--
Crack	2.1 (1.3--3.4)	--
Physical violence	2.4 (1.4--4.1)	2.2 (1.1--4.1)
Injection drug use	2.3 (1.4--4.0)	2.4 (1.21--4.7)
Log of frequency of sex	p-value $\geq$ .05	1.4 (1.1--1.7)
Age	p-value $\geq$ .05	
Ethnicity	p-value $\geq$ .05	

\*variables associated with the outcome variable in the bivariate analysis, as well as control variables, were included in the multivariate mode

quencies and bivariate associations. STATA version 8 was used for multivariate analysis.

**RESULTS**

**Sample Characteristics**

Table I describes the characteristics of the 290 participants. The population was predominantly non-Hispanic black or Caucasian (39% and 36%, respectively). Thirty-three percent were married and 81% reported being monogamous in the previous six months. Only 33% had a paid job in the six months preceding the study; 80% had a high school or greater

having had at least one same-sex partner during their lifetime. Significantly more women reported having exchanged sex for money or drugs on at least one occasion and significantly more men reported frequent alcohol use in the past six months. Drug use was also common, with 42% reporting crack cocaine use and 29% reporting injection drug use in the previous six months.

Of this study population fifty-four percent reported inconsistent or no condom use in their partnership, and 23 of the 145 couples disagreed on levels of condom use. The median duration of these partnerships was 4.2 years (range 0.3 – 31.7 years). In

the previous six months, 29% of respondents reported being threatened (50 individuals) or experiencing physical violence (71 individuals) (see Table I).

### Partner Behaviors

Table II shows significant bivariate associations between partners for physical violence or threats of physical violence (OR, 3.2; 95% CI, 1.9, 5.6. If one member of a partnership injected drugs, his or her partner was more likely to inject drugs as compared with the partner of an individual who did not use injection drugs (OR, 38.3; 95% CI, 18.8, 78.0). A similar association was seen for crack cocaine use; individuals

who used crack cocaine were more likely to have a partner using crack cocaine (OR, 12.9; 95% CI, 7.3, 22.7).

### Association between Violence and Condom Use

Table III shows the results of the bivariate and multivariate analyses of physical violence and other potential predictor variables with inconsistent condom use. Individuals who reported experiencing physical violence or threats of physical violence were 2.4 times as likely to use condoms inconsistently as individuals not reporting such violence (OR, 2.4; 95% CI, 1.4, 4.1). (Tables III).

Logistic regression was used to examine the association between IPV and inconsistent condom use. The variables controlled for were: HIV serostatus; gender; age; ethnicity; HIV-infected partner's gender; employment status; educational level; marital status; monogamy; frequency of sex; sex work; history of bisexual behavior; alcohol use; crack use; and injection drug use. A multivariate analysis was used to assess the association between physical violence and inconsistent condom use. We observed that physical violence was associated with double the likelihood of inconsistent condom use (OR, 2.2; 95% CI, 1.1, 4.1). In this model, increased frequency of vaginal sex, history of bisexual behavior and injection drug use were also significantly associated with inconsistent condom use (see Table III)

## DISCUSSION

In our analyses, we explored the associations between physical violence and inconsistent condom use among individuals in HIV-serodiscordant heterosexual partnerships in northern California. We observed a significant association between inconsistent condom use and physical violence: the risk of inconsistent condom use was double for those experiencing physical abuse. This association parallels findings reported in a recent review article on the intersection of IPV and HIV [10]. The authors of this review article, Geilen et al.,

expressed the importance of including substance abuse as a third intertwined problem that must be considered in understanding this intersection which our findings also substantiate. More recently a possible link between violence-related post traumatic stress disorder on immunity to HIV acquisition and HIV disease progression had been proposed, this could particularly impact the well-being of individuals who are HIV-serodiscordant relationships [11].

The association between IPV and inconsistent condom use has been reported in the past; however, the interpretation of this association varies. Some researchers have theorized that women feel less empowered to request that condoms be used if they are in a violent relationship or that a woman may be too "worn down " to resist unsafe sex at the hands of an infected partner [12, 13]. Other researchers have proposed that violence may occur following disclosure of HIV status or when a woman requests the use of condoms [12, 14, 15]. Still others have postulated that abusive men are more likely to have HIV and impose risky sexual practices on partners, thereby putting these women at increased risk of HIV infection [16,17]. In addition, the finding that abusive men often behave in ways that increase their own risk of acquiring HIV (e.g. having multiple partners and lower rates of condom use) and therefore transmitting HIV, further exacerbates the risk posed to women who have sexual relationships with these men [18, 19]. Examining the association between IPV and condom use in more longitudinal studies, as well as exploring mediators and moderators of this association would deepen our understanding of how these risks are related and thus, how we should design prevention strategies.

In the models looking at the association between IPV and inconsistent condom use, three other variables were also significantly associated with inconsistent condom use – injecting drug use, frequency of vaginal sex, and a history of bisexual behavior. The association with frequency of vaginal sex may simply be due to increased opportunity for inconsistent condom use. History of bisexual behavior might reflect a less conventional approach to sexual behaviors on the part of the individual, including lack of condom use, or may be a marker for an individual who is less concerned with image management and more likely to report lack of condom use [20].

Individuals reporting having injected drugs were more likely to have a partner who injects drugs. In the majority of cases, therefore, injection drug use was a couple-level problem that could potentially impair the judgment of both partners and result in decreased use of condoms. Investigators have found that paranoia,

impaired judgment, and distorted interpretation of social cues, which occur as a result of the drugs mentioned above, may also lead to a violent interaction [18,21]. In addition, a qualitative investigation found that drug use by one or both partners increased the risk of physical and sexual violence, as well as concomitant sexual HIV risks [22, 23].

Our findings suggest more specific or qualitative research on injection drug use, bisexual behavior and the nature and severity of IPV may be warranted in order to tease out causal relationships. These findings support the theory that such manifestations of drug use may play a role in mediating violence among substance abusers [18, 21]. Such drug use is considered a risk factor for HIV infection, especially via needle sharing or trading drugs for sex.

Most of the previous literature examining intimate partner violence and condom use has relied on data collected solely from women and indicates an association between IPV and inconsistent condom use. Our study was different as we used data from both men and women, but our findings concur with the earlier results, and show that the association between physical violence and inconsistent condom use is present, even when gender is included in the multivariate model. The reciprocity of physical violence and drug use in our sample indicate that in some cases these are couple-level phenomena, e.g., rather than one victim and one perpetrator, both partners are in both roles. Associations between intimate partner violence and condom use may have a different explanation when women are violent towards their male partners than interpretations regarding this phenomenon when men are the perpetrators [24]. In a study of abuse and risky sexually behavior among men and women with HIV/AIDS neither gender of the perpetrator nor gender of the victim entirely explained the abuse-unprotected sex association presented. In spite of the limitations of having data from only one member of the couple, the authors of this study proposed that something about the balance of power in heterosexual relationships in combination with HIV status of those in these relationships may help explain these effects [4].

The nature of the California Partners Study II data, with information collected from both partners of a couple, has allowed us to draw certain conclusions which are detailed below. However, as with all such behavioral studies, certain limitations are inherent in the data and methods. First, the data from this study were collected in the late 1990s which limits our examination of issues that may have emerged since that time. For example, we did not measure methamphetamine use. Despite this limitations, many factors that were risks for HIV 10

years ago are still risks today (e.g., injection drug use). In addition, people with HIV are living longer and healthier lives than in past decades and thus, the data on sexual behavior and violence within HIV-serodiscordant couples is potentially applicable to an even larger group of people than it was 10 years ago. Another limitation of this study is that both the outcome and explanatory variables are subject to social desirability bias. Unsafe sex practices, such as inconsistent condom use, increase risk of HIV infection and may be subject to misreporting. In general in the United States, intimate partner violence is also fraught with stigma and thus subject to underreporting, but the level of acceptability varies by subculture and population [25]. As these variables were assessed through self-reporting, the reliability of the results may be questionable. One sign of lack of reliability may be that 23 of the 145 couples disagreed on levels of condom use. Although prior examination of these data for correlates with inconsistent condom use was conducted using multivariate couple-level analyses [7] in order to use all observations, particularly due to the difficulties with reporting partner violence, analyses were conducted at the individual level. Our analysis of the relationship of inconsistent condom use to other variables looked at all individuals in this sample, including these 46 individuals from couples that disagreed on their responses to the outcome variable. The validity of the data could also be reduced in partnerships in which both members misrepresent their level of condom use. No 'gold standard' has been developed to validate self-reported data concerning sexual practices or experiences of IPV. Similarly, there was no way in our study to assess whether intimate violence was accurately reported, although other studies have shown that it is often under-reported [26].

Furthermore no measure of injury from partner physical violence was collected in this study. Men and women reported comparable levels of physical violence by their partners. Although similar prevalence of male-to-female and female-to-male physical violence have been reported in marital relationships in the United States, studies have shown that women are more likely to be injured by men's aggression (physical, sexual) than men are by women [27, 28]. Partners of individuals who reported experiencing physical abuse were 3.2 times more likely to report that they experienced IPV themselves, which implies at least some level of reciprocity of this type of physical violence in these relationships.

## CONCLUSIONS

The association of IPV with inconsistent condom use remains a significant problem with implications for

further research as well as for prevention development. Studies with a primary focus on HIV tend to measure sexual and drug-using behavior in great detail, but may measure other phenomena such as IPV in a more cursory way. In order to understand the intricacy of this well-established association, studies are needed that are truly cross-cutting. In other words, such research would also need to have detailed measures of various types of partner violence. For example, future research on IPV and sexual risk in couples could examine different types of violence (e.g. physical, sexual or psychological), how they are related to HIV risk and what variables might moderate that association (e.g. biological sex, HIV status).

The high prevalence of injection drug use complicates the picture for some populations at risk for IPV and inconsistent condom use. Our findings suggest that interventions for HIV-serodiscordant couples should address the complexity of risk behaviors occurring within these relationships. Ensuring that interventions not only address safer sex behaviors, but also shared drug use and violence may increase our ability to holistically affect couples' health. This is especially critical in this highly vulnerable population of HIV-serodiscordant couples where efforts aimed at decreasing transmission of HIV are of great urgency.

**Disclosure:** The findings and conclusions in this article are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

**Acknowledgements:** This research was supported by cooperative agreement U64/CCU912270 from the U.S. Centers for Disease Control and Prevention. The authors thank the California Partners Study II participants and staff for contributing to this research, and to Cynthia Gomez for her contributions as co-PI. Thank you to June Brady Hyde for her assistance editing this manuscript. For A. van der Straten and N. Padian research work for this study was conducted at the University of California, San Francisco, Department of Obstetrics, Gynecology and Reproductive Sciences.

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