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VIOLENCE, COPING, AND CONSISTENT MEDICATION ADHERENCE IN HIV-POSITIVE COUPLES

Eliot J. Lopez, Deborah L. Jones, Olga M. Villar-Loubet, Kristopher L. Arheart, and Stephen M. Weiss

University of Miami Miller School of Medicine, Miami, FL

Abstract

The purpose of this study was to investigate the extent to which intimate partner violence (IPV) influences antiretroviral medication adherence. Furthermore, it was hypothesized that adherence would differ for men and women based on degree of violence and coping strategies employed by each gender. A sample of HIV seroconcordant and serodiscordant heterosexual couples was recruited from the Miami area and assessed on rates of medication adherence, conflict resolution tactics, and coping strategies. Of these, 190 individual participants were prescribed antiretroviral medication. Baseline rates of adherence were 90.29% for men and 87.77% for women. Acts of violence were found to have negative effects on adherence for women but not for men. However, negative coping strategies were predictive of poor adherence for men but not women. Violence was found to be related to poor coping styles for both men and women. This study offers support for the inclusion of partners in conducting interventions. Furthermore, it underlines the importance of recognizing IPV as a barrier to medication adherence.

The success of antiretroviral treatment for patients diagnosed with HIV is contingent on the maintenance of strict medication regimens. Active illicit drug use, discomfort in having to disclose one's HIV status (Chesney, 2000) and depression (Royal et al., 2009; Waldrop-Valverde & Valverde, 2005) can act as barriers to consistent medication use, while adaptive coping strategies, such as acceptance, are associated with increased medication adherence (Singh et al., 1996). Low levels of adherence have negative effects on long-term goals for disease management and can effectively increase the rate of medication resistance, ultimately leading to treatment failure (Paterson, Potoski, & Capitano, 2002). Conversely, high adherence rates are typically associated with clinically significant reductions in viral load (Bangsberg et al., 2000; Gardner et al., 2008). As a result, consistent medication use is crucial for treatment success.

Violence may impede the benefits of antiretroviral medication in an indirect manner, potentially serving as a barrier to consistent medication adherence. Violent relationships are often accompanied by forced sexual coercion (Kalichman, Williams, Cherry, Belcher, & Nachimson, 1998), increased sexual risk taking (He, McCoy, Stevens, & Stark, 1998), and imposed limits on a woman's ability to negotiate safer sex behaviors, including condom use (Beadnell, Baker, Morrison, & Knox, 2000), all of which are risk factors for HIV exposure, infection, and reexposure. However, despite this relationship with HIV, intimate partner violence (IPV) has been neglected as a potential impediment to health protective behaviors such as medication adherence. With the prevalence of IPV occurring within the HIV-

positive community owing to these comorbid risk factors, it is important to also consider violence as a potential barrier to consistent medication adherence.

In addition to IPV, gender has been considered a barrier to consistent adherence, though research findings related to gender differences with regard to medication adherence have been inconsistent. Gender has been found to have both no influence on adherence (Holzemer et al., 1999) as well as playing a role in consistent medication use (Arnsten et al., 2002; Turner, Laine, Cosler, & Hauck, 2003; Wagner, 2002). This potential disparity in adherence rates suggests it is important to determine whether differences exist between men and women, as well as the mechanisms responsible for these differences if they exist, including relational issues such as IPV.

The purpose of this study was to investigate the extent to which IPV influences medication adherence and to determine whether there were any differences in adherence rates between genders within the context of IPV, hypothesizing that individuals experiencing higher levels of violence would report lower levels of adherence, regardless of gender. Furthermore, the investigators explored differences in coping strategies between the genders, hypothesizing that positive coping strategies, such as active coping or utilization of social support, would be associated with increased adherence, while negative coping strategies, such as substance-use coping or self-blame, would be associated with decreased adherence. Finally, the investigators hypothesized that individuals reporting higher levels of violence would employ more negative coping strategies than those reporting lower levels of violence.

METHODS

PARTICIPANTS AND DESIGN

The NOW2 Project was a randomized study that recruited 145 HIV seroconcordant and serodiscordant heterosexual couples ($N = 290$ individuals), between May 2006 and June 2008. The study consisted of a group-based intervention aimed at increasing couples' skills in sexual risk reduction, condom negotiation, and conflict resolution strategies. Participants were drawn from the Miami metropolitan area and primarily recruited from community health centers and the special immunology clinic at the Jackson Memorial Hospital/University of Miami Miller School of Medicine. Prior to participant recruitment, institutional review board approval was obtained in accordance with the provisions of the U.S. Department of Health and Human Services regarding the conduct of research. Potential recruits were screened for eligibility (i.e., couples with a minimum of 6 months as a couple to reduce potential attrition due to separation, 18 years or older, currently sexually active and verification of seropositive status of one or both members of the couple). Participants completed an informed consent, were tested for other sexually transmitted infections (HIV [if HIV-seronegative], syphilis, chlamydia, and gonorrhea) and completed a baseline assessment of demographic information, adherence and coping strategies. Participants provided consent and completed a baseline assessment in English using an audio computer-assisted survey instrument (ACASI). With ACASI, the respondent listened to the questions from the computer using audio headphones while having the option of simultaneously reading the questions on the computer screen. Responses were recorded by touching the appropriate symbol on the computer touchscreen. All participants received monetary compensation for their travel expenses and their time.

MEASURES

Demographics—This questionnaire elicited data on age, religion, nationality, ethnicity, educational level, employment status, residential status, approximate date of HIV diagnosis,

mode of infection, marital status, current partner and children's serostatus, living situation, number of children, and substance use.

ACTG Questionnaire for Adherence to Anti-HIV Medications—Adherence was measured by 4-day self-report using the ACTG (AIDS Clinical Trials Group) Questionnaire for Adherence to Anti-HIV Medications (4 days; Chesney et al., 2000). Participants were asked to provide the total number of pills they are prescribed as well as the number of doses missed over the course of the previous 4-day period. These data were converted into an average adherence percentage, with 100% indicating perfect adherence.

COPE—The COPE (Carver, Scheier, & Weintraub, 1989), a 38-item scale, was used to determine the strategies participants used to cope with AIDS-related stressors over the past month. The COPE has been used with varied medical populations (Ingledew, Hardy, Cooper, & Jemal, 1996; Cronbach's $\alpha > .61$). COPE sub-scales are theoretically derived and measure preferential use of problem focused and emotion focused coping strategies. Responses were recorded using a Likert scale of "not at all" (1), "a little bit" (2), "medium" (3), and "a lot" (4). Twelve subscales were selected to assess coping responses: Active Coping ($\alpha = .68$), Planning ($\alpha = .73$), Instrumental Support ($\alpha = .64$), Emotional Support ($\alpha = .71$), Denial ($\alpha = .54$), Behavioral Disengagement ($\alpha = .65$), Venting ($\alpha = .50$), Self-Distracton ($\alpha = .71$), Substance Use ($\alpha = .90$), Religion ($\alpha = .82$), Denial ($\alpha = .54$), and Self-Blame ($\alpha = .69$). Each subscale's score was based on the total of two items specific to that subscale.

Conflict Tactics Scale—The Conflict Tactics Scale is a modified 17-item scale (Straus, 1979) that assessed current and previous incidents of relationship violence. The scale identifies current or previous violence across time (from never to two or three times to more than once a month) and along a behavioral continuum (from reasoning to verbal aggression to violence) in current or previous relationship(s). Individuals were identified as being currently physically abused if they had been exposed to violence once or more in the last 12 months and, as previous victims of physical abuse, if they had ever been exposed to violence in a relationship. Responses to the scale were categorized as indicative of one of four types of behaviors: positive communication, such as rationally discussing a problem; negative communication, such as yelling or swearing; violence, such as throwing items; or extreme violence, such as using a weapon.

Statistical Analyses—Data were analyzed using the Statistical Package for Social Sciences (SPSS). To assess gender differences, men and women were analyzed individually rather than couples. This study used independent samples *t* tests to compare means between men and women and between categorizations for violence (violence and no-violence). Correlations are reported as Pearson's *r* statistics. Hierarchical regression analyses were conducted to determine the predictive ability of selected variables, and results are presented as *F* values with beta weights. Data met assumptions of hierarchical linear regression. Analyses and comparisons were conducted using an alpha of .05.

RESULTS

PARTICIPANTS

Of the 290 individuals enrolled in the NOW2 Project, 190 heterosexual HIV seropositive men and women (men = 96, women = 94; Table 1) who were prescribed antiretroviral medication were identified for these analyses. A large proportion of the sample was African American, unemployed, and had previously been in treatment for drug addiction.

MEDICATION ADHERENCE

Average medication adherence rate for men over a 4-day period was 90.29% ($SD = 19.70\%$). The average rate of medication adherence for women over the same length of time was 87.77% ($SD = 24.60\%$). There was no significant difference in medication adherence between genders, $t(153) = .70, p = .48$.

IPV AND ADHERENCE

Medication adherence for the total sample was found to be negatively correlated with extreme violence ($r = -.21, p = .01$), in which reports of extreme acts of violence increase were associated with decreased adherence to medication. However, when examining this relationship by gender, IPV was not associated with adherence for men ($r = -0.15, p = .17$), but was for women ($r = -0.26, p = .026$).

PREDICTORS OF ADHERENCE FOR TOTAL SAMPLE

Medication adherence was negatively associated with extreme violence ($r = .21, p = .01$) as well as with substance coping ($r = -0.20, p = .012$). Hierarchical multiple regression was used to assess the predictive ability of extreme violence and substance coping on medication adherence for the total sample, after controlling for both gender and time since diagnosis. Gender and time since diagnosis, which was calculated in months, were entered at Step 1, explaining 3% of the variance in medication adherence. After entry of extreme violence and substance use coping at Step 2, the total variance explained by the model as a whole was 18%, $F(4, 85) = 4.54, p = .002$. The two measures accounted for an additional 15% of the variance in adherence, after controlling for gender and time since diagnosis, R^2 change = .15, F change (2, 85) = 7.56, $p = .001$. In the final model, both extreme violence and substance use coping were statistically significant, with extreme violence recording a higher beta value (beta = $-0.29, p = .005$) than substance use coping (beta = $-0.20, p = 0.050$).

PREDICTORS OF ADHERENCE FOR MEN

Hierarchical multiple regression was used to assess the predictive ability of extreme violence and substance coping on medication adherence for men, after controlling for time since diagnosis. Time since diagnosis, which was calculated in months, was entered at Step 1, explaining 4% of the variance in medication adherence. After entry of extreme violence and substance use coping at Step 2, the total variance explained by the model as a whole was 16%, $F(4, 76) = 2.86, p = .020$. The two measures accounted for an additional 12% of the variance in adherence, after controlling for time since diagnosis, R^2 change = .12, F change (4, 76) = 2.67, $p = .039$. In the final model, substance use coping was the only variable which significantly contributed to medication adherence (beta = $-0.28, p = .017$).

PREDICTORS OF ADHERENCE FOR WOMEN

Hierarchical multiple regression was used to assess the predictive ability of extreme violence and substance coping on medication adherence for women, after controlling for time since diagnosis. Time since diagnosis, which was calculated in months, was entered at Step 1, explaining 3% of the variance in medication adherence. After entry of extreme violence and substance use coping at Step 2, the total variance explained by the model as a whole was 13.2%, $F(3, 69) = 3.74, p = .015$. The two measures accounted for an additional 10% of the variance in adherence, after controlling for time since diagnosis, R^2 change = .10, F change (3, 69) = 3.51, $p = .020$. In the final model, extreme violence was the only variable which significantly contributed to medication adherence (beta = $-0.37, p = .004$).

COPING AND IPV AMONG MEN

To differentiate between those male participants who were more likely to experience violence and those less likely, men who were enrolled in the study were categorized based on whether they reported their female partners have ever pushed, grabbed, or shoved them during an argument as an indicator for potential escalation of violence. Of the men, 43.1% ($N = 62$) endorsed physical violence from their partners during an altercation.

Men who reported violence perpetrated by their female partners report higher levels of negative communication, $t(143) = -0.30, p < 0.001$, violence, $t(1, 63.02) = -8.87, p < 0.001$, and extreme violence, $t(1, 61.67) = -4.80, p < 0.001$. Furthermore, men reporting violence were more likely to utilize substance use, $t(142) = -3.73, p < 0.001$, denial, $t(142) = -2.30, p = .023$, and religion as coping strategies, $t(142) = -2.54, p = .012$.

COPING AND IPV AMONG WOMEN

To differentiate between those participants who were more likely to experience violence and those less likely, female participants who were categorized based on whether they reported their male partners ever threatened to hit them or throw something at them during an argument as an indicator for potential escalation of violence. Of the women, 30.3% ($n = 44$) endorsed threats of violence from their partners during an altercation.

Women who reported being threatened by their male partners indicated higher levels of negative communication, $t(143) = -6.89, p < 0.001$, violence, $t(1, 44.81) = -8.57, p < 0.001$, and extreme violence, $t(1, 43.77) = -3.77, p < 0.001$. Furthermore, women reporting violence were more likely to utilize denial coping, $t(143) = -2.42, p = .017$ than women reporting low levels of violence. Finally, women reporting less violence were more likely to utilize acceptance as a coping strategy than women reporting experiencing more violence, $t(143) = -.76, p = .024$.

DISCUSSION

This study investigated potential differences in adherence between men and women and focused on the extent to which IPV within the couple influenced medication adherence in both genders. Furthermore, we explored differences in coping strategies between genders, hypothesizing that positive coping strategies, such as active coping or utilization of social support, would be associated with increased adherence. Whereas negative coping strategies, such as substance-use coping or self-blame, would be associated with decreased adherence. Finally, we hypothesized that individuals reporting higher levels of violence would employ more negative coping strategies than those reporting lower levels of violence.

There were no differences in medication adherence rates between men and women, which is consistent with existing research (Holzemer et al., 1999). Exploratory analyses demonstrated that though gender played little role in adherence, men and women were independently influenced by certain factors, which then affected adherence. In particular, utilizing substances as a means of coping was predictive of adherence to medications among men whereas women who experienced extreme forms of violence by their partners were less likely to maintain optimal adherence. This finding may be due to women being less concerned with maintaining their medication regimens and more concerned with personal safety. Furthermore, men's roles in antiretroviral adherence appear substantial, being both responsible for their own adherence as well as influencing their partner's adherence.

IPV was indicative of negative conflict resolution strategies and coping styles for both men and women. Men who experienced violence from their partners also reported negative verbal communication and lesser forms of physical violence, such as pushing and shoving,

while women report similar acts of violence from their partners. This finding may reflect the escalation of verbal conflict into more extreme forms of violence, so these patterns are not unexpected. However, clinically, it is important to note negative communication styles as indicators of potential violence within the relationship.

Men who reported violence also endorsed negative coping styles, such as substance use and denial, whereas women who have experienced violence reported utilizing denial as a strategy. These coping strategies may help explain the perpetuation of violence in these relationships, as those experiencing violence may use denial as a means of coping with the situation, using rationalization as a reason for maintaining the relationship. In addition, substance use may also lead to further violence, creating a cycle of abuse.

Although these data are provocative, the study sample (low socioeconomic status, minority current or former drug users) limits the generalizability of the findings. A more diverse sample would provide a broader understanding of the effects of IPV on medication adherence.

This study provides support for research conducted with couples rather than individuals. As noted above, men appear to play a strong role in medication adherence, both their own adherence, through substance use, and their partners' adherence, through acts of violence. By assessing both partners in a relationship, addressing communication styles as well as conflict resolution tactics, interventions may increase the potential for behavioral change. Furthermore, results highlight the role of religion for men as a means of coping when faced with violent relationships. It may be useful to incorporate spirituality or religion when developing behavioral interventions for HIV seropositive men. Additionally, it may be helpful to further explore the role of denial in violent relationships, examining the perceived reinforcement associated with this coping strategy and the perpetuation of its use. Finally, these results suggest the importance of encouraging the use of more adaptive coping strategies; strategies associated with decreased IPV among women. By improving women's skills in coping, providing additional focus on enhancing positive strategies of conflict resolution, the occurrence of IPV may decrease within the couple.

When interpersonal conflict leads to violence, it has an impact on medication adherence, which, in turn, adversely affects multiple health indices in HIV treatment and care. Clearly, the need for interventions targeting this population is merited for both men and women, as violence affects both members of a relationship. It may be beneficial for men to be included in interventions with women, as the active involvement of both partners may be more likely to yield successful outcomes. Clinicians should include assessment of IPV in their counseling regarding health behaviors such as medication adherence. The success of antiretroviral treatment is dependent on consistent adherence to medication, which includes attention to both facilitators of adherence as well as barriers to its success.

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TABLE 1**Participant Demographics**

	Men	Women
Number of participants	96	94
Age	46.61 (<i>SD</i> + 6.5)	42.69 (<i>SD</i> + 7.6)
Ethnicity	African American: 84.5%	African American: 68.1%
	Caucasian: 3.6%	Caucasian: 19.4%
	Haitian: 3.6%	Haitian: 1.4%
	Cuban: 2.4%	Puerto Rican: 6.9%
	Other: 6.0%	Cuban: 1.4%
		Other: 2.8%
Employment status	Unemployed: 67.9%	Unemployed: 76.4%
	Working: 26.2%	Working: 18.1%
	Volunteering: 6.0%	Volunteering: 5.6%
Income below \$5,000/year	46.40%	48.60%
Mean length of diagnosis (in months)	125.2	120.81
Percentage Actively using drugs	21.40%	11.10%
Currently disabled status	60.70%	65.30%
Mean grade level completed	11	11
Mode of HIV transmission	Sex: 71.4%	Sex: 86.1%
	Drug Use: 14.3%	Don't Know: 6.9%
	Don't Know: 9.5%	Drug Use: 4.2%
Previous treatment for drug addiction	76.20%	75.00%
Previous treatment for alcohol addiction	32.10%	38.90%