UCLA
UCLA Previously Published Works

Title

Sexual Risk Behaviors and Acceptability of HIV Pre-Exposure Prophylaxis Among HIV-Negative Gay and Bisexual Men in Serodiscordant Relationships: A Mixed Methods Study

Permalink

https://escholarship.org/uc/item/2p85f8c1

Journal

AIDS Patient Care and STDs, 26(2)

ISSN

1087-2914

Authors

Brooks, Ronald A
Landovitz, Raphael J
Kaplan, Rachel L
et al.

Publication Date

2012-02-01

DOI

10.1089/apc.2011.0283

Peer reviewed

eScholarship.org Powered by the California Digital Library
University of California

AIDS PATIENT CARE and STDs
Volume 25, Number 2, 2011
© Mary Ann Liebert, Inc.
DOI: 10.1089/apc.2011.0283

ORIGINAL ARTICLE

Sexual Risk Behaviors and Acceptability of HIV Pre-exposure Prophylaxis Among HIV-Negative Gay and Bisexual Men in Serodiscordant Relationships: A Mixed Methods Study

Ronald A. Brooks, Ph.D.,[1] Raphael J. Landovitz, M.D.,[2] Rachel L. Kaplan, M.P.H.,[3]
Eli Lieber, Ph.D.,[4] Sung-Jae Lee, Ph.D.,[5] and Thomas W. Barkley, D.S.N.[6]

Abstract

The objective of this mixed methods study was to examine current sexual risk behaviors, acceptability and potential adoption of pre-exposure prophylaxis (PrEP) for HIV prevention, and sexual behavior intentions with PrEP adoption among HIV-negative gay and bisexual men (GBM) in HIV serodiscordant relationships. A multiracial/ethnic sample of 25 HIV-negative GBM in serodiscordant relationships completed a qualitative interview and a brief interviewer-administered survey. A modified grounded theory approach was used to identify key themes relating to acceptability and future adoption of PrEP. Participants reported engaging in sexual risk behaviors that place them at risk for HIV infection. Participants also reported a high level of acceptability for PrEP and willingness to adopt PrEP for HIV prevention. Qualitative themes explaining future PrEP adoption included: (1) the opportunity to engage in sex using a noncondom HIV prevention method, (2) protection from HIV infection, and (3) less anxiety when engaging in sex with an HIV-positive partner. Associated with the future adoption of PrEP, a majority (64%) of participants indicated the likelihood for an increase in sexual risk behaviors and a majority (60%) of participants also indicated the likelihood for a decrease or abandonment of condom use, both of which are in contrast to the findings from the large iPrEx study. These findings suggest that the use of PrEP by HIV-negative GBM in serodiscordant relationships carries with it the potential for risk compensation. The findings suggest that PrEP only be offered as part of a comprehensive HIV prevention strategy that includes ongoing risk reduction counseling in the delivery of PrEP to help moderate risk compensation.

Introduction

Pre-exposure prophylaxis (PrEP) is a biomedical approach to HIV prevention that involves the use of HIV antiretroviral medications by uninfected individuals as a means of reducing their risk of infection. The idea for PrEP is based on earlier clinical studies showing the effectiveness of antiretroviral medications in preventing some forms of HIV transmission, including mother-to-child transmission,[1] post-occupational exposure among health care workers,[2] and postsexual and injection drug use exposure.[3] Additionally, animal studies have demonstrated that pre-exposure use of the antiretroviral tenofovir disoproxyl fumarate (TDF) plus emtricitabine (Truvada®, Gilead Sciences, Foster City, CA) provided significant protection to macaque monkeys exposed repeatedly to an HIV-like virus.[4,5] Currently, clinical trials are assessing the safety and efficacy of oral PrEP among a variety high risk populations.

The completed clinical trials provide evidence of the safety and efficacy of PrEP for HIV prevention. Results from the first

[1]Department of Family Medicine, [2]Center for Clinical AIDS Research & Education, David Geffen School of Medicine, University of California, Los Angeles, California.
[3]Department of Social Welfare, School of Public Affairs, [4]Department of Psychiatry and Biobehavioral Sciences Center for Culture and Health, [5]Center for Community Health, Semel Institute for Neuroscience and Human Behavior, University of California, Los Angeles, California.
[6]School of Nursing, California State University, Los Angeles, California.

PrEP trial (iPrEx) found that daily use of Truvada reduced the risk of HIV infection among men who have sex with men and transgender women by 44%; participants with 90% or greater adherence to the daily regimen reduced their risk of HIV infection by 73%.[6] Two additional clinical trials, the Partners PrEP study and the Centers for Disease Control and Prevention's (CDC) TDF2 study, provided evidence that PrEP can reduce the risk of HIV infection among heterosexual men and women.[7,8] The Partners PrEP study, which consisted of HIV serodiscordant couples, found that HIV-negative partners who took TDF reduced their risk of infection by 62% and those who took Truvada reduced their risk by 73%.[7] The CDC's study found that heterosexual men and women who took Truvada reduced their risk of infection by 63%.[8] The positive outcomes of these clinical trials suggest the potential of PrEP to reduce the number of new HIV infections in local epidemics.

In a real-world setting, the population level effectiveness of PrEP will depend on its acceptability, adoption, and sustainability among high-risk populations. Without these components even the most highly efficacious PrEP medication will have little impact in reducing HIV infections. To date, limited research has focused on the social and behavioral factors associated with PrEP acceptability and adoption. Previous studies focused on PrEP knowledge and off-label use of antiretroviral medications as PrEP and attitudes and potential use of PrEP among MSM.[9–13] Despite these studies, a gap exists in knowledge regarding acceptability and potential adoption of PrEP among HIV-negative gay and bisexual men (GBM) in serodiscordant relationships, a specific target population for PrEP.[14] In this mixed methods study, we examine the sexual risk behaviors, acceptability, and potential adoption of PrEP, along with intentions to change sexual behaviors of HIV-negative GBM who are in an HIV-serodiscordant relationship. The study focused on a hypothetical PrEP medication that was proven safe and efficacious and was ready for dissemination as an HIV prevention tool.

Methods

This analysis is based on data collected for a couples study examining the potential adoption of PrEP among HIV serodiscordant male couples.[15] For the current analysis, we examined data from HIV-negative partners, given they would be the potential recipients of PrEP. The study description is based on the larger parent study.

Participants

A sample of 25 gay and bisexual HIV serodiscordant male couples ($n = 50$ individuals) residing in Los Angeles, California, were recruited from local AIDS service organizations and screened over the phone to determine eligibility. Inclusion criteria specified that participants be male partners, at least 18 years of age and in an HIV-serodiscordant relationship for a minimum of 12 months. Eligible couples were scheduled for an interview. After providing informed consent, each partner participated in an in-depth interview lasting approximately 90 min. Participants were compensated $30. The UCLA Institutional Review Board approved the study. An experienced qualitative interviewer conducted the interviews.

Data collection and measures

Qualitative interview.

A semistructured interview guide was used to gather information from participants, including: (1) current HIV prevention methods, (2) perceptions of and potential adoption of a hypothetical PrEP medication that was shown to be 90% effective in preventing HIV infection, and (3) potential changes in sexual behavior associated with the adoption of PrEP. For this study, we elected to assess the acceptability of a highly efficacious PrEP medication set at 90% effective; this level is close to the 92% efficacy noted in the iPrEx study for those with detectable levels of the drug, making this analysis particularly relevant.[16,17] Prior to beginning the interview, each participant received a brief tutorial on the concept of PrEP, followed by a description of how PrEP would be used to prevent HIV infection.

After completing the qualitative interview, an interviewer-administered survey was used to gather demographic characteristics, sexual and substance use behavior, and attitudes and beliefs about PrEP. Sexual risk behaviors included number of male sex partners, sex outside the primary relationship, frequency of unprotected insertive and receptive anal sex, and condom use during last episode of insertive and receptive anal sex with both primary and casual partners. Substance use behavior for alcohol, marijuana, methamphetamines, ecstasy, and sex drugs (i.e., Viagra®, Pfizer, New York, NY; Cialis®, Eli Lilly, Indianapolis, IN; Levitra®, : Bayer HealthCare Pharmaceuticals ,West Haven, CT) was assessed for the prior 30 days.

Data analysis

Digitally recorded interviews were transcribed verbatim and checked against the original audio recording for accuracy. Dedoose, a Web-based application for managing, integrating, and analyzing qualitative and mixed methods data was used for data analysis.[18]

Qualitative analysis.

A modified grounded theory approach was employed to identify themes that might explain PrEP adoption intentions among HIV-negative GBM in serodiscordant relationships.[13,14] An extensive list of codes and their definitions was derived from the interview guide, interviewer field notes, and multiple readings of the transcripts. The coding team, consisting of the first author (R.A.B.) and a master's-level researcher (R.L.K.), reviewed and discussed the codes and identified exemplar text associated with each code. The coders then independently coded two interviews. An interrater reliability score was computed for the pretest (overall Cohen's κ statistic, $\kappa = 0.94$). The coding team then met again to discuss discrepancies in their coding and to reach consensus on the final codes. The coding team then coded two additional interviews and achieved an inter-rater reliability score of $\kappa = 0.93$ for the final codes. All codes were entered into Dedoose and tagged to their associated segments of text for all interviews. Text segments were then sorted by codes and reviewed by the coding team to identify emergent themes and to identify recurring patterns of responses to assess prevalence of themes. The results represent findings organized by the final themes identified in the analyses.

Quantitative analysis.

Data were analyzed using SPSS (PASW Statistics 18, SPSS Inc., Chicago, IL). Descriptive

statistics were performed to provide a demographic, sexual and substance use profile of study participants. Means and standard deviations were derived to assess participants' attitudes and beliefs regarding the use of PrEP for HIV prevention.

Results

Survey results

Demographics. The sample was comprised primarily (80%) of racial/ethnic minority men. Three quarters of the men (76%) identified themselves as gay/homosexual with the remaining 24% identifying themselves as bisexual. The remaining demographic characteristics of the study population are outlined in Table 1.

Sexual risk and substance use behavior

In the past 6 months, close to half of the participants (44%) reported having had sex outside of their primary relationship (Table 2). Approximately one third of the sample (36%) reported having had unprotected receptive anal intercourse and two thirds (64%) reported unprotected insertive anal intercourse. A greater percentage of participants reported no condom use during last episode of receptive and insertive anal intercourse with primary versus casual partner (20% versus 12% and 48% versus 24%). On average, participants reported engaging in insertive versus receptive anal intercourse twice as many times (22.29 versus 10.09). Nearly three quarters of participants (72%) reported substance use in the prior 30 days with alcohol (60%) and marijuana (44%) the most commonly used substances.

Table 1. Sociodemographic Characteristics of Participants ($n = 25$)

Characteristics	n *(%)*
Age: mean (SD)	37.3 (10.8)
Race/ethnicity	
Hispanic/Latino	8 (32%)
White/Caucasian	5 (20%)
Black/African American	10 (40%)
Mixed race and Asian/Pacific Islander	2 (8%)
Education	
High school/less than high school	9 (36%)
Some college/college degree	16 (64%)
Sexual orientation	
Gay/homosexual	19 (76%)
Bisexual	6 (24%)
Length of relationship in years:	
Mean (SD)	3.4 (4.5)
Employment status	
Working (full-time or part-time)	10 (40%)
Permanent disability	3 (12%)
Unemployed	9 (36%)
Retired or other	3 (12%)
Annual income	
$ 0–$19,999	14 (56%)
> $20,000	11 (44%)
Insurance coverage	14 (56%)
Insurance type	
Private insurance or HMO	8 (32%)
Medicaid/Medicare	6 (24%)
No insurance	11 (44%)
Seen by a doctor in the previous 12 months	21 (84%)

SD, standard deviation; HMO, health maintenance organization.

Table 2. Participants' Sexual and Substance Use Behavior ($n = 25$)

Sexual behavior previous 6 months	n	*(%)*
Sex outside primary relationship	11	44%
Number of sex partners—*mean (SD)*	2.38	(2.30)
Receptive anal sex		
Number of times engaging in receptive anal sex—*Mean (SD)*	10.09	(22.50)
Unprotected receptive anal sex	9	36%
No condom use last time receptive partner in anal sex with:		
Primary partner	5	20%
Casual partner	3	12%
Insertive anal sex		
Number of times engaging in insertive anal sex—*Mean (SD)*	22.29	(30.84)
Unprotected insertive anal sex	16	64%
No condom use last time insertive partner in anal sex with:		
Primary partner	12	48%
Casual partner	6	24%
Substance use past 30 days		
Alcohol use	15	60%
Marijuana	11	44%
Methamphetamines	7	28%
Ecstasy	1	4%
Sex drugs (Viagra, Cialis, Levitra)	3	12%
Any substance use	18	72%

Note: For categorical variables, numbers and percentages are reported. For continuous variables, means and standard deviations are reported.
SD, standard deviation.

Qualitative results

HIV prevention strategies. Participants were asked to describe the HIV prevention strategies currently used with their HIV-positive partner. The strategies fell along an HIV prevention continuum extending from strict adherence to safer sex practices, to harm reduction methods, to a complete disregard for HIV prevention. For the majority of men (71%) some level of condom use during anal sex was included in their prevention methods. For consistent condom users, condoms were viewed as a necessary tool when engaging in sex with their HIV-positive partner. Inconsistent condom users viewed condoms as necessary but noted a variety of situations when they were not used. For others, harm reduction techniques such as strategic positioning (e.g., insertive partner only with HIV-positive partner) and withdrawal prior to ejaculation were used as prevention methods. For a small number of participants no prevention methods were used. Table 3 includes participant quotes describing these strategies. We noted differences in safer sex practices by racial/ethnic identity, with 70% of African American men reporting consistent condom use compared with only 40% of Hispanic/Latino men and 40% of white/Caucasian men.

Table 3. Participants' Statements Regarding Current HIV Prevention Strategies and Acceptability and Adoption of PrEP

Consistent condom use

First and foremost, there has never ever been a situation where we have not used condoms (African American, age 24).

The main thing is using protection, condoms, and I'm not under the influence that alters my rational thinking. I'm not having sex with multiple people (African American, age 43).

I use condoms. I put um lubricant inside and outside the condom and I try to have as little activity as possible without using condoms (Hispanic, age 31).

Inconsistent condom use

Well, staying checked [for HIV] for one. Sex is really not all the time, so when we do it it is protected, but not all the time (African American, age 27).

Sometimes we have been unprotected at the spur of the moment or like say the condom didn't work right, it broke or something (African American, age 44).

Strategic positioning and withdrawal

Well, the main thing is I'm not bottoming. I'm the top. Well, in all fairness I did bottom twice in the last year ……But no ejaculating inside of me that was the rule. (Hispanic, age 39)

When I bottom, yes, definitely we do [use condoms]. When I top, sometimes, but not always…not so much now when I top (Mixed race, age 44)

Unprotected sex

Actually, to me the big thing would be using a condom. I mean, that would be one of the biggest things, but to be honest with you, were not (Caucasian, age 41).

To be honest with you, we don't [use condoms]. I have been with him for almost 2 years now, and I have never had protected sex and I got my blood work yesterday and I am still negative (Hispanic, age 29)

Positive views of PrEP

I think it's a great idea. Anything that can help prevent the spread of HIV or any disease as far as that's concerned is good and beneficial to everybody (African American, age 43).

I am very positive about it. I think that if you are in a relationship where one partner is positive and the other isn't, I think that to have the option to take something that has been proven to be effective is tremendous, I really do (African American, age 56).

I think this would be a great breakthrough. I think it would be a huge stride on the preventative side of things, and I think a lot of people would be willing to try it (Caucasian, age 41).

Negative views of PrEP

I just don't know about taking HIV medicine to stop HIV when you don't have HIV; this sounds crazy. I just think I can get it if you are taking HIV medicine and you don't have it. I think you would get it. I wouldn't trust it (African American, age 33).

I probably wouldn't take it because I know HIV medications are very strong and if you don't have to take them why would you. And I'm healthy, so why would I do damage to my body to protect myself but I still got a chance of getting it, when I can just use a condom and continue what I've been doing. And it's a new thing too, so it's like why would I want to be a guinea pig (African American, age 43)

Noncondom protection

I would feel safer about having unprotected sex with my partner. I wouldn't be so scared about getting infected because I would be taking this pill and I see it on the same level as using condoms, it's a way of protecting yourself. So if my partner has trouble using condoms, then I could use the pill and be just as safe, and that's good, and then we could both enjoy having unprotected sex and not having to deal with the issues we might have using condoms (Caucasian, age 26).

I would want to take it so that I don't have to worry about condoms, I don't have to worry about infection, and I can just have sex whenever, wherever, and however I want" (Mixed Race, age 44).

Protection against HIV

I would definitely take it because it would help and hopefully prevent me from ever becoming infected as long as I stay on that regimen (African American, 43)

Well, I would want to take the pill because I know that I am putting myself at risk just without, you know, without using condoms with my other half, so, you know, taking this pill will reduce the chances of me contracting HIV (Hispanic, age 29).

If I was prescribed the pill I would not negate condoms just because I was on the pill. I would still take that extra precaution, but just having that pill would give me just that much more assurance that I won't contract the disease (African American, age 24).

I started off with the condom; I'm kinda like safe with that, I know that will always be there, so a pill would kinda be like a backup (Hispanic, 28).

Less anxiety when engaging in sex with an HIV-positive partner

I would take it for better sex with my partner and not having the stress on my brain, worried about whether or not we did something wrong and did I contract the virus (African American, age 44).

I would be less uptight about the whole idea of having sex with an HIV+ person (Caucasian, age 41).

It would give me a lot more relaxation having sex with someone who is HIV+ (African American, age 24).

PrEP, pre-exposure prophylaxis.

Acceptability and adoption of PrEP

Acceptability of PrEP for HIV prevention was high among participants, with 80% of the men offering positive and enthusiastic comments regarding this new prevention technology. Participants expressed an interest in seeing new prevention methods made available for serodiscordant couples. Two participants offered negative views of PrEP with both men reacting with skepticism and disbelief to the idea of using an HIV medication to prevent HIV infection. Table 3 includes quotes exemplifying these perceptions. There were no differences in level of acceptability and adoption of PrEP by racial/ethnic grouping.

A majority of participants (80%) indicated a willingness to adopt PrEP in the future. Three themes emerged that may explain intentions to use PrEP: (1) the opportunity to engage in sex using a non-condom prevention method, (2) protection against HIV, and (3) less anxiety when engaging in sex with an HIV-positive partner. Representative comments for each theme are included in Table 3 and explained below.

Noncondom protection

Some men suggested that the reason for the likely future adoption of PrEP was the opportunity to engage in condomless sex, either with their serodiscordant partner or casual partners. Other participants equated PrEP adoption with greater sexual freedom.

Protection against HIV

Protection against HIV infection was another primary motivator for the future adoption of PrEP. Some participants indicated a desire to adopt PrEP because of their current high-risk behaviors. Other participants suggested that PrEP would provide an additional layer of protection, in addition to using condoms.

Less anxiety

Less anxiety and stress when engaging in sex with their HIV-positive partner was a reason cited for the future adoption of PrEP. For some participants, PrEP would make having sex with an HIV-positive partner more comfortable.

Sexual behavior and condom use intentions

The majority of men (64%) described ways that their sexual behaviors would likely change with the adoption of PrEP. Many of these changes were in the direction of greater risk taking. Some participants indicated that they would engage in behaviors that were previously not part of their sexual repertoire because of the risk of HIV infection (i.e., anal intercourse). For some men it was the frequency of certain sexual acts such as anal or oral sex that would likely increase. Two participants indicated that their sexual behaviors would not change immediately but that they might change the longer they were using PrEP and the more confident they were of its effectiveness. Sample quotes exemplifying sexual behavior intentions are included in Table 4.

The majority of men (60%) noted that they would be less worried about having to use condoms and would either decrease or abandon condom use with the adoption of PrEP. For some men PrEP may offer a false sense of protection, particularly as they use it over time, leading to condom abandonment. The remaining 40% of participants indicated that they would continue using condoms with PrEP either because of the chance of contracting other sexually transmitted diseases or because condoms have been their primary method of protection. Sample comments on condom use intentions are included in Table 4.

Table 4. Participants' Statements Regarding Sexual Behavior and Condom Use Intentions with PrEP Adoption

Increase risky behavior
I could engage in more risky behavior because I now have that extra layer of confidence and protection. I'm taking this pill every day and it protects me…(African American, age 33).
I would feel more free to engage in certain sexual activities that I might had fear about before (Caucasian, age 26).
I probably would have sex with somebody who is positive bareback and have them top me in the beginning, if I'm on the pill, and maybe not cum in me because its only partly effective, but I could take him bareback and so, I would be more confident in having him penetrate me bareback if I'm on the pill (Mixed Race, age 44).
Increase frequency of sexual behaviors
I would feel much more comfortable having sex with him, with me bottoming for him…he really wants to top more often, but I won't allow him, so it would benefit us, it would just make things much better for us (Hispanic, age 39).
I would probably give him more oral sex which he likes (African American, age 44).
The oral sex would be more in-depth if I were to be on this pill, it would be more often, because that [fear of HIV infection] is one of the primary reasons as to why I don't have oral sex with my partner as much as he would like or I would like for that matter (African American, age 24).
Delayed change in sexual behaviors
My behaviors would not change, but down the line if I still am very confident that it was effective, they may (African American, age 56).
Abandon condoms
It [condom use] would probably change dramatically, 100% less use, more than likely (African American, age 44).
Well, I guess we probably wouldn't use condoms as much or at all, I guess we would probably see this as protecting against HIV just like condoms would. I think on a regular basis if I was on the pill then we wouldn't use condoms (Caucasian, age 24).
I would probably end up thinking well, after taking it for a while, like a month or two, I would probably feel like okay I can stop using condoms because it would've build up in my body apparently (Hispanic, age 40).
It [PrEP] might make me stop using condoms altogether (Caucasian, age 41).
Continue to use condoms
I don't believe my feelings about that [condom use] would change because there are other infections and diseases that can come into play with unsafe sexual practices (African American, age 56).
I think it [condom use] would still be the same. It's all about using protection no matter what (African American, age 23).
I don't really think it [condom use] would change because what I'm doing today works, so there's no need in changing it but adding to it maybe with this pill (African American, age 43).

PrEP, pre-exposure prophylaxis.

Table 5. Participants' Attitudes and Beliefs About Use of PrEP for HIV Prevention ($n=25$)

Statements	*Mean agreement score and (SD)*
PrEP for HIV prevention	
Taking a daily HIV pill would be a good way to protect myself from getting HIV.	3.48 (0.65)
If I take PrEP when it becomes available, I can lower my chances of getting infected with HIV.	3.36 (0.49)
If my doctor suggested that I take PrEP to protect myself from getting HIV, I would take it.	3.48 (0.59)
Risk compensation/disinhibition	
Taking PrEP would mean you can have sex without using condoms.	2.20 (1.00)
Having PrEP available will make safer sex less important.	2.36 (0.91)
If I was taking PrEP I would be more likely to have sex without using a condom.	2.76 (1.20)
HIV stigma	
I would be very uncomfortable taking HIV medicines when I don't have HIV.	1.88 (0.93)
Side effect of PrEP	
Not knowing if there are long-term side effects of taking a daily HIV pill makes me very uncomfortable.	3.08 (0.86)
I would be more comfortable using PrEP if I knew just how it would affect my health.	3.48 (0.51)
PrEP adoption intentions	
I would wait until other people were taking PrEP before I use it myself.	2.56 (0.96)
I would be one of the first people to use PrEP, if it were available.	2.80 (1.04)

Note: Response categories: Strongly disagree = 1, Disagree = 2, Agree = 3, Strongly agree = 4.
SD, standard deviation; PrEP, pre-exposure prophylaxis.

Survey results

Attitudes and beliefs about PrEP. Participants' attitudes and beliefs regarding PrEP are summarized in Table 5. There was agreement among the men for statements supporting use of PrEP for HIV prevention. Overall, participants were in disagreement with statements suggesting that safer sex and condom use would be less important, while at the same time agreeing somewhat with the statement suggesting that they would be more likely to engage in unprotected sex. We did observe a difference by racial/ethnic identify for the later statement, with Hispanic/Latino and white/Caucasian men agreeing with this statement (mean = 3.38, standard deviation [SD] = 0.75 and mean = 3.00, SD = 1.23, respectively) and African American men disagreeing with this statement (mean = 2.10, SD = 1.3). Participants did not agree with the HIV stigma statement, "I would be very uncomfortable taking HIV medicines when I don't have HIV." The men were in agreement with statements regarding lack of information on the long-term effects of PrEP on one's health. Related to PrEP adoption intentions, the men were somewhat in agreement with the contradictory statements suggesting that they would "wait and see" before using PrEP adoption and that they would be "one of the first people to use PrEP." Overall, the men revealed cautionary acceptance of PrEP.

Discussion

Our findings indicate that HIV-negative GBM in serodiscordant relationships continue to engage in sexual risk behaviors that place them at risk for HIV infection. In the past six months, two thirds of the sample (64%) reported unprotected insertive anal intercourse and one third (36%) reported unprotected receptive anal intercourse. Nearly half of the men (48%) reported no condom use during last episode of insertive anal sex and 20% reported no condom use during last episode of receptive anal intercourse with their HIV-positive partner. These findings suggest that HIV-negative GBM with serodiscordant partners may benefit from alternative methods for HIV prevention.

While the majority of men (71%) described some level of condom use as their primary prevention method, this group included both consistent and inconsistent condom users. Among noncondom users, harm reduction methods such as strategic positioning and withdrawal were their primary prevention strategies. While harm reduction strategies remain important components of the HIV prevention continuum for GBM, they do not provide the level of level of protection afforded by barrier methods.[21,22] Supplemental types of prevention methods, such as PrEP, may be useful for those men who are unable or unwilling to use condoms consistently with their HIV-positive partner.

In the findings from our qualitative data we noted a high level of acceptance for PrEP with a majority of men (80%) indicating a willingness to adopt PrEP in the future, a level similar to what was observed among MSM in Boston.[12] Our survey data supported this high level of acceptability, with men agreeing with statements suggesting the use of PrEP for HIV prevention. These findings are significant given that the level of uptake of PrEP will determine its population level effect in reducing HIV infections among GBM.[23] Despite a high level of acceptability reported here, in our earlier work we also noted a number of barriers and concerns associated with future PrEP adoption, such as the cost of PrEP, side effects of taking HIV medications, potential problems associated with missing doses, intermittent use, discontinuing PrEP and long-term use, and the procedures involved with accessing PrEP (i.e., only available from medical providers and required routine HIV testing).[15] Without significant and sustained uptake by high-risk populations, PrEP may have little effect in decreasing new HIV infections.

Three key themes emerged from our qualitative interviews that might help explain intentions to use PrEP among HIV-negative GBM with HIV-positive partners, including: (1) using PrEP as a noncondom alternative for HIV prevention, (2)

using PrEP for protection against HIV infection whether or not condoms are used, and (3) using PrEP to decrease the psychological distress associated with engaging in sex with an HIV-positive partner. The first two themes suggest the possibility of risk compensation with the adoption of PrEP among this population.

The majority of men indicated that the adoption of PrEP would likely prompt changes in sexual behavior that would result in greater risk-taking behavior. They also indicated that the adoption of PrEP could potentially contribute to a decrease or abandonment of condom use. If the sexual risk behaviors of GBM on PrEP increases, other research studies have already indicated that this may offset any potential benefit of PrEP in reducing HIV infections at the population level.[23,24] Interestingly, our findings regarding risk compensation are in notable contrast to the risk behavior findings of the iPrEx study, which documented a decrease in sexual partnering, and an increase in condom use in both the Truvada and placebo arms of the study.[6] As a randomized controlled trial, participants in the iPrEx study received frequent and regular counseling on the importance of consistent condom use, in addition to being reminded that their study treatment might be a placebo; and even in the event that it were not, that efficacy had not been demonstrated for Truvada as an HIV prevention strategy; thus the true real-world effect of PrEP on sexual risk behavior, when deployed and implemented in the community, remains a persistent and pressing question. Given the potential for risk compensation suggested by our findings, and the regular risk counseling provided in the iPrEx study, it may be prudent to offer PrEP in combination with some form of ongoing risk reduction counseling as part of the delivery of PrEP.

For this study we used a mixed methods approach by conducting a quantitative interviewer-administered survey to assess current sexual risk behaviors and perceptions of PrEP and conducting qualitative in-depth interviews to understand current HIV prevention practices and examine the motivations and preferences toward PrEP. The mixed methods design allowed us to complement our rich narrative data with quantitative survey data for a more comprehensive understanding of current sexual risk behaviors, motivators for adopting PrEP and to explore the risk behavior intentions in response to PrEP availability among a primarily racially/ethnically minority sample of HIV-negative GBM with serodiscordant partners.

These findings should be interpreted within the study's limitations. First, lay individuals may have found it difficult to comment on a hypothetical PrEP medication; we believe, however, that the PrEP tutorial provided prior to beginning the interview helped mitigate this potential problem. Second, the study did not assess willingness to take a PrEP medication on a daily basis, and adherence is an important component of PrEP's efficacy as noted in the findings from iPrEx study.[6] Finally, while the study design and small sample size limits generalizability to the larger community of HIV-negative GBM, the findings are likely transferable to other similar populations.

PrEP is a new biomedical HIV prevention technology that could potentially reduce the number of new infections among HIV-negative GBM in serodiscordant relationships. In addition, serodiscordant couples could potentially utilize a combination approach to HIV prevention that includes PrEP for the HIV-negative partner and the early initiation and adherent use of HIV medications by the HIV-positive partner as a means of suppressing individual viral load and thus reducing the chance of transmitting the virus to their HIV-negative partner.[25]

Acknowledgments

Funding for this research was provided by the UCLA AIDS Institute and the UCLA Center for AIDS Research (AI28697). Dr. Lee's time on this manuscript was supported by the National Institute of Mental Health (grant NIMH 5K01MH085503). We also wish to thank the participants in this study who so graciously provided us with a wealth of information for this study.

Author Disclosure Statement

No competing financial interests exist.

References

1. Guay LA, Musoke P, Fleming T, et al. Intrapartum and neonatal single-dose nevirapine compare with zidovudine for prevention of mother-to-child transmission of HIV-1 in Kampala, Uganda: HIVNET 012 randomized trial. Lancet 1999;354:795–802.
2. Cardo D, Culver DH, Ciesielski CA, et al. A case-control study of HIV seroconversion in health care worker after percutaneous exposure. N Engl J Med 1997;337:1485–1490.
3. Center for Disease Control and Prevention (CDC). Antiretroviral postexposure prophylaxis after sexual, injection-drug use, or other nonoccupational exposure to HIV in the United States. MMWR Morb Mortal Wkly Rep 2005;54: 1–20.
4. Garcia-Lerma JG, Otten RA, Qari SH, et al. Prevention of rectal SHIV transmission in macaques by daily or intermittent prophylaxis with emtricitabine and tenofovir. PLOS Med 2008;5:e28:0291–0299.
5. Van Rompay KK, McChesney MB, Aguirre NL, et al. Two low doses of tenofovir protect new-born macaques against oral simian immunodeficiency virus infection. J Infect Dis 2001;184:429–438.
6. Grant R.M, Lama JR, Anderson PL, et al. Preexposure Chemoprophylaxis for HIV Prevention in Men Who Have Sex with Men. N Engl J Med 2010;363:2587–2599.
7. Baeten JM, Celum C. Antiretroviral pre-exposure prophylaxis for HIV-1 prevention among heterosexual African men and women: The Partners PrEP Study [Abstract MOAX0106]. 6th International AIDS Society Conference on HIV Pathogenesis, Treatment and Prevention (IAS 2011). Rome, Italy: July 17–20, 2011.
8. Thigpen MC, Kebaabetswe PM, Smith DK, et al. Daily oral antiretroviral use for the prevention of HIV infection in heterosexually active young adults in Botswana: Results from the TDF2 study [Abstract WELBC01]. 6th International AIDS Society Conference on HIV Pathogenesis, Treatment and Prevention (IAS 2011). Rome, Italy: July 17–20, 2011.
9. Barash EA, Golden M. Awareness and use of HIV pre-exposure prophylaxis among attendees on a Seattle gay pride event and sexually transmitted disease clinic. AIDS Patient Care STDs 2010;24:689–691.
10. Kellerman SE, Hutchinson AB, Begley EL, Boyett BC, Clark HA, Sullivan P. Knowledge and use of HIV pre-exposure

prophylaxis among attendees of minority gaypride events. J Acquir Immune Defic Syndr 2006;43:376–377.
11. Liu AY, Kittredge PV, Vittinghoff E, et al. Limited knowledge and use of HIV post- and pre-exposure prophylaxis among gay and bisexual men. J Acquir Immune Defic Syndr 2008;47:241–247.
12. Mimiaga MJ, Case P, Johnson CV, Safren SA, Mayer KH. Preexposure antiretroviral prophylaxis attitudes in high-risk Boston area men who report having sex with men: Limited knowledge and experience but potential for increased utilization after education. J Acquir Immune Defic Syndr 2009;50:77–83.
13. Nodin N, Carballo-Diéguez A, Ventuneac AM, Balan IC, Remien R. Knowledge and acceptability of alternative HIV prevention bio-medical products among MSM who bareback. AIDS Care 2008;20:106–115.
14. Paxton L, Hope T, Jaffe HW. Pre-exposure prophylaxis for HIV infection: What if it works? Lancet 2007;370:89–93.
15. Brooks RA, Kaplan RL, Lieber E, et al. Motivators, concerns, and barriers to adoption of preexposure prophylaxis for HIV prevention among gay and bisexual men in HIV-serodiscordant male relationships. AIDS Care 2011;23:1136–1145.
16. Anderson P, Lama J, Buchbinder S, et al. Interpreting detection rates of intracellular FTC-TP and TFV-DP: The iPrEx trial [Abstract 96LB]. 18th Conference on Retroviruses and Opportunistic Infections (CROI 2011). Boston, Massachusetts: February 27 to March 3, 2011.
17. Grant R, Lama J, Glidden D, et al. Pre-exposure chemoprophylaxis for prevention of HIV among trans-women and MSM: iPrEx study [Abstract 92]. 18th Conference on Retroviruses and Opportunistic Infections (CROI 2011). Boston, MA: February 27 to March 3, 2011.
18. SocioCultural Research Consultants, LLC. 2011, Dedoose version 3.1. www.dedoose.com (Last accessed October 11, 2011).
19. Braun V, Clarke V. Using thematic analysis in psychology. Qual Res Psychol 2006;3:77–101.
20. Strauss A, Corbin J. Basics of Qualitative Research. Thousand Oaks, CA: Sage, 1998.
21. Marks G, Millett G A, Bingham T, et al. Prevalence and protective value of serosorting and strategic positioning among Black and Latino men who have sex with men. Sex Transm Dis 2010;37:325–327.
22. Parsons JT, Schrimshaw EW, Wolitski RJ, et al. Sexual harm reduction practices of HIV-seropositive gay and bisexual men: Serosorting, strategic positioning, and withdrawal before ejaculation. AIDS 2005;19(Suppl 1):S13–25.
23. Desai K, Sansom SL, Ackers ML, et al. Modeling the impact of HIV chemoprophylaxis strategies among men who have sex with men in the United States: HIV infections prevented and cost effectiveness. AIDS 2008;22:1829–1839.
24. Paltiel AD, Freedberg KA, Scott CA, et al. HIV preexposure prophylaxis in the United States: Impact on lifetime infection risk, clinical outcomes, and cost-effectiveness. Clin Infect Dis 2009;48:806–815.
25. Cohen M S, Chen Y Q, McCauley M, et al. Prevention of HIV-1 infection with early antiretroviral therapy. N Engl J Med 2011;365:493–505.

Address correspondence to:
Ronald A. Brooks, Ph.D.
UCLA Department of Family Medicine
10880 Wilshire Boulevard, Suite 1800
Los Angeles, CA 90024

E-mail: rbrooks1@ucla.edu