

Longitudinal Association of HIV Conspiracy Beliefs with Sexual Risk Among Black Males Living with HIV

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Abstract Research is needed to identify culturally relevant factors that may contribute to sexual risk among African Americans. We investigated HIV-specific medical mistrust as one such cultural factor, often exhibited as conspiracy beliefs about HIV (e.g., “AIDS was produced in a government laboratory”), which may be indicative of general suspicion of HIV treatment and prevention messages. Over a 6-month time-period, we measured endorsement of HIV conspiracy beliefs three times and frequency of condom use monthly among 181 HIV-positive African American males. A hierarchical multivariate repeated-measures logistic random effects model indicated that greater belief in HIV conspiracies was associated with a higher likelihood of reporting unprotected intercourse across all time-points. An average of 54% of participants who endorsed conspiracies reported unprotected intercourse, versus 39% who did not endorse conspiracies. Secondary prevention interventions may need to address medical mistrust as a contributor to sexual risk among African Americans living with HIV.

Keywords African American/Black · HIV/AIDS
Conspiracy Beliefs · Sexual Behavior

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Introduction

Among all racial/ethnic groups and both males and females, the highest rates of HIV and AIDS diagnoses are among African American men [1], and the predominant mode of transmission among African American men is sex with men [2]. African American men who have sex with men (MSM) have exponentially higher rates of HIV and AIDS than do individuals from other at-risk subcategories [3, 4], and are more than twice as likely to be infected with HIV than are MSM of other races/ethnicities [5]. Although a multitude of factors have been hypothesized to contribute to African American MSM’s greater vulnerability to HIV infection [6], additional research is needed to identify culturally relevant factors that may affect sexual risk.

One cultural factor that may influence African Americans’ sexual risk (and consequent HIV infection) is HIV-specific medical mistrust, or suspicion of medical providers, HIV treatments, and public health prevention messages. Such mistrust, which may have arisen from decades of racism in health care and society in general, is high among African Americans [7–10]. In particular, HIV conspiracy beliefs (e.g., “The government created HIV as a form of genocide against African Americans”), a form of medical mistrust, are prevalent among African Americans [11, 12]. For example, in a national random sample of African Americans in the U.S., nearly half of respondents somewhat or strongly endorsed the belief that “HIV is a manmade virus” [12]. Such beliefs have been associated with more negative attitudes about condoms and a lower likelihood of condom use among African American men in the general public [11, 12], as well as nonadherence to treatment among African American men living with HIV [13]. Thus, HIV conspiracy beliefs may be a barrier to HIV prevention and treatment efforts: individuals who endorse such beliefs may

be suspicious of (and therefore unlikely to follow) public health prevention recommendations regarding safer sexual behavior, and treatment recommendations from physicians.

Although the relationship of HIV conspiracy beliefs to sexual risk has been observed in general samples of African Americans, prior research has not examined this association among African American males living with HIV; nor has previous work examined this relationship longitudinally, in order to establish whether it holds over multiple time-points and is robust to changes in conspiracy beliefs and/or sexual risk. In the present research, we assessed both conspiracy beliefs and sexual risk over a 6-month period among African American male participants living with HIV.

Methods

Participants and Procedures

A total of 214 African American male participants living with HIV participated. As previously described [13, 14], they were recruited using flyers at 3 HIV social service agencies and an HIV medical clinic in Los Angeles, CA over 2 years, from January 2007 to February 2009. Interested individuals were screened via telephone for the following eligibility criteria: (1) Black/African American identity; (2) self-identification as male; (3) HIV-positive serostatus; (4) aged 18 years-old or older; and (5) on antiretroviral treatment. Institutional review board approval was obtained from all of the authors' primary institutions, and a federal Certificate of Confidentiality was issued by the National Institutes of Health.

After providing informed consent, participants completed an audio computer-assisted self-interview (ACASI) at baseline that contained several measures of interest to the present analyses, including HIV conspiracy beliefs, sexual behavior, and socio-demographic characteristics. Participants returned monthly for 6 months post-baseline to report on sexual behavior in the past month (roughly since the last follow-up assessment). At 3- and 6-months post-baseline, participants responded to items assessing belief in HIV conspiracies. Participants received \$30 for the baseline assessment and \$20 for each follow-up assessment; participants who completed all seven assessments were given an additional \$30 bonus.

Measures

Socio-demographic Characteristics

Participants reported their date of birth, education, income, employment, sexual orientation, and housing status.

Education (i.e., highest degree earned) was dichotomized into low (less than high school diploma) versus high school diploma or greater; annual income into low (<\$5,000 annually) versus \geq \$5,000 annually; employment into employed full/part-time versus unemployed, on disability, retired, or in school; sexual orientation into heterosexual versus other categories (i.e., gay/same-gender loving, bisexual, not sure or in transition, something else, or don't know); and housing status into stable (rent or own home or apartment; subsidized housing) versus unstable (homeless, living rent-free with friend/relative, residential treatment facility, temporary/transitional housing).

HIV Conspiracy Beliefs

At baseline and 3- and 6-months post-baseline, participants indicated their agreement with 8 items assessing belief in specific HIV-related conspiracies (1 = strongly disagree; 2 = slightly disagree; 3 = neutral; 4 = slightly agree; 5 = strongly agree); a "don't know" option was recoded as "neutral." We derived an overall average scale score that had excellent internal consistency ($\alpha = 0.92$) and good test-retest reliability (baseline to 3-month follow-up = 0.74; baseline to 6-month follow-up = 0.78; 3-month to 6-month follow-up = 0.77). We also created two subscales, one 6-item subscale representing "genocidal" conspiracies ($\alpha = 0.92$; e.g., "AIDS is a form of genocide, or planned destruction, against Blacks"), and one 2-item subscale assessing "treatment-related" conspiracies ($\alpha = 0.78$; e.g., "People who take the new medications for HIV are human guinea pigs for the government"). The construction and validation of the scale and its subscales have been detailed in prior publications [12, 13].

Sexual Risk

At baseline, participants who reported any male sexual partners in the past 3 months were asked the frequency of protected and unprotected insertive and receptive anal intercourse (i.e., with and without condoms). Participants who reported any female sexual partners in the past 3 months were asked the frequency of protected and unprotected anal and vaginal intercourse. Separate questions assessed each type of sexual behavior with HIV-positive, HIV-negative, and unknown HIV-serostatus male and female partners. At each monthly follow-up, the same sexual behaviors were used as in the baseline assessment, but with a past-month time-frame (i.e., since the last assessment). Thus, we aimed to capture continuous sexual behavior data for the entire 6 months of the study. At baseline and follow-up, sexual risk was defined in three ways: reported engagement in any unprotected intercourse with male or female partners; reported engagement in any

unprotected intercourse with negative or unknown-status male or female partners (a measure of transmission risk behavior); and reported engagement in any unprotected intercourse with positive or unknown-status male or female partners (a measure of risk for exposure to new infections and/or different strains of HIV).

We derived values for each sexual risk variable for three time-points per participant: baseline, and 3- and 6-months post-baseline. Specifically, we collapsed data across the 1-, 2-, and 3-month follow-up assessments of condom use, such that participants who reported unprotected intercourse at any of the three time-points were considered to have had unprotected intercourse at the 3-month follow-up. Similarly, we collapsed data across the 4-, 5-, and 6-month follow-up assessments of condom use to derive a variable for unprotected intercourse at the 6-month follow-up. Because conspiracy beliefs were measured only three times (at baseline, and 3- and 6-months post-baseline), collapsing the sexual behavior data into three time-points allowed us to match the conspiracy beliefs and sexual behavior variables at each time-point within the analysis.

Statistical Analysis

We used a hierarchical repeated-measures logistic random effects model to test the relationship between HIV conspiracy beliefs and sexual risk. A spatial-power covariance structure [15] accounted for uneven spacing of follow-up assessments (because participants did not tend to return exactly one month later for each follow-up visit, and the number of days in between follow-up assessments varied slightly between participants). Bivariate models were used to test the relationship of HIV conspiracy beliefs (overall, genocidal, and treatment-related) to sexual risk over time. Multivariate models were conducted for the overall HIV conspiracy beliefs scale and subscales that were significantly related to sexual risk in bivariate analyses. Multivariate models controlled for baseline sexual risk, number of follow-up time-points completed, number of weeks since the baseline interview, and socio-demographic covariates that were associated with any of the sexual risk outcomes at $P < 0.20$ (income, employment status, sexual orientation). Covariates with missing values were imputed using the overall mean; no covariate was missing more than 3 observations.

Results

Participant Characteristics

A total of 214 participants were interviewed at baseline, of whom 181 (85%) had sufficient sexual behavior and

conspiracy beliefs data for analysis. Of the 214, 187 reported any sexual activity; of those 187, 181 had both sexual behavior data and conspiracy beliefs data for at least one time-point, and 6 were missing either conspiracy beliefs or sexual behavior data, or both, for every time-point. Of the 181 participants with complete data, 101 completed all three assessments (at baseline, and 3- and 6-months post-baseline), 52 completed the baseline survey (but not the 3- and 6-month follow-ups), 15 completed the baseline and 3-month follow-up only, and 13 completed the baseline and 6-month follow-up only. Participants who did not return for at least one of the 2 follow-ups did not significantly differ from other participants on baseline conspiracy beliefs or sexual risk (all P -values > 0.50).

On average, participants were 43.4 years old ($SD = 8.2$). The sample generally had low socio-economic status: 39% had incomes of less than \$5,000 annually, 85% were unemployed, and 22% had less than a high school degree. Nearly half (46%) were in unstable living situations, with 6% homeless, 8% in a rehabilitation facility, 13% with a friend or relative, 17% in temporary/transitional housing (e.g., HIV-specific or substance-free housing), and 2% in another type of unspecified situation. Over half were in more stable living conditions, with 43% in an owned or rented home, and 12% in subsidized housing. In terms of sexual orientation, 22% identified as heterosexual, 58% as gay, 18% as bisexual, and 3% as not sure, in transition, or "other." Twenty-one participants (12%) were transgender (male-to-female).

Levels of HIV conspiracy beliefs and sexual risk were substantial. Across all three time-points, 75% agreed with at least one HIV conspiracy belief; 61% agreed with 2 or more. As shown in Table 1, the most frequently endorsed conspiracy beliefs were "HIV is a manmade virus" (52% slightly or strongly agreed across time-points) and "AIDS was produced in a government laboratory" (46% slightly or strongly agreed across time-points). Although frequency of endorsement was consistently higher among those who engaged in unprotected intercourse, only two items showed significant differences between those who engaged in unprotected intercourse and those who did not, based on Fisher's Exact tests: "AIDS was created by the government to control the Black population" (48% vs. 32%, respectively); and "HIV was created and spread by the CIA" (34% vs. 17%, respectively) (P -values < 0.05).

Of the 181 participants in the analysis sample, 88% reported sex with male partners, 73% reported sex with female partners, and 61% reported both male and female partners in their lifetime. At baseline, of the 157 reporting any male or female partner, 40% reported any unprotected intercourse (i.e., with positive, negative, or unknown serostatus partners), 16% reported any unprotected intercourse with HIV-negative or unknown serostatus partners, and

Table 1 Endorsement of HIV conspiracy beliefs among 181 HIV-positive African American males on antiretroviral treatment overall, and by engagement in unprotected intercourse

HIV conspiracy belief	% Agree overall ^a	% Agree, of those who engaged in unprotected intercourse	% Agree, of those who did not engage in unprotected intercourse
Genocidal beliefs			
HIV is a manmade virus.	51.9	56.3	44.9
AIDS was produced in a government laboratory.	45.9	50.0	39.1
There is a cure for AIDS, but it is being withheld from the poor.	42.0	45.5	36.2
AIDS was created by the government to control the Black population.	42.0	48.2*	31.9
AIDS is a form of genocide, or planned destruction, against Blacks.	39.8	44.6	31.9
HIV was created and spread by the CIA.	27.6	33.9*	17.4
Treatment-related beliefs			
People who take the new medications for HIV are human guinea pigs for the government.	31.5	36.6 ⁺	23.2
The medication used to treat HIV causes people to get AIDS.	11.6	13.4	8.7

⁺ $P < .10$; * $P < .05$

Note Significance values correspond to Fisher's Exact tests comparing column three and column four percentages. HIV conspiracy item frequencies represent any endorsement over the course of the 6-month study, and unprotected sex frequencies represent any unprotected sex over the course of the 6-month study

^a Strongly or slightly agree

32% reported any unprotected intercourse with HIV-positive or unknown serostatus partners. During the 6-month study, 71% reported sex with men, 28% reported sex with women, and 11% reported sex with both at any time-point. Among the 141 reporting any sex during the 6-month follow-up period, 57% reported any unprotected intercourse; 43% reported unprotected intercourse with negative or unknown serostatus partners; and 48% reported unprotected intercourse with positive or unknown serostatus partners.

Bivariate and Multivariate Tests of the Relationship of HIV Conspiracy Beliefs to Sexual Risk

As shown in Table 2, higher levels of HIV conspiracy beliefs, as measured by the overall scale and the genocidal subscale, were significantly associated over time with any unprotected intercourse (regardless of partner type) and any unprotected intercourse with positive or unknown status partners (all P -levels < 0.05). HIV conspiracy beliefs were not significantly associated with unprotected intercourse with negative or unknown serostatus partners, and the treatment-related conspiracy beliefs subscale was not significantly associated with sexual risk over time (and thus will not be considered further in multivariate models).

Table 3 shows the multivariate models for any unprotected intercourse (regardless of partner serostatus) and HIV conspiracy beliefs; separate models were conducted for the overall conspiracy beliefs scale and the genocidal conspiracy beliefs subscale. Both multivariate models

indicated that the relationship between conspiracy beliefs and sexual risk remained significant (both P -levels < 0.05) with the addition of the set of socio-demographic covariates. Similarly, in the multivariate models shown in Table 4, both the overall conspiracy beliefs scale and the genocidal conspiracy beliefs subscale were significantly associated with any unprotected intercourse with positive or unknown serostatus partners.

Figure 1 illustrates the relationship between HIV conspiracy beliefs and sexual risk (i.e., any unprotected sex, regardless of serostatus) at each of the three study time-points. HIV conspiracy beliefs are shown at each time-point as dichotomized into no endorsement of conspiracy beliefs, versus endorsement of any conspiracy belief (i.e., one or more). The figure suggests that, during each time interval, those who endorsed conspiracy beliefs were more likely to report unprotected intercourse than did those who did not believe in conspiracies. Across time intervals, an average of 39% of participants who did not endorse conspiracies reported inconsistent condom use, versus 54% of participants who did endorse conspiracies. Levels of unprotected intercourse seemed to be lower at baseline than at either follow-up time-point.

Discussion

Our research is the first comprehensive longitudinal investigation of the relationship between HIV-specific

Table 2 Bivariate relationships of HIV conspiracy beliefs with unprotected intercourse over the 6-month study time-period (n = 181)

HIV conspiracy beliefs	Any unprotected intercourse odds ratio (95% confidence interval)	Any unprotected intercourse (negative/unknown serostatus partners) odds ratio (95% confidence interval)	Any unprotected intercourse (positive/unknown serostatus partners) odds ratio (95% confidence interval)
Overall scale	1.32 (1.03–1.70)*	1.26 (0.96–1.65) ⁺	1.37 (1.06–1.77)*
Genocidal subscale	1.31 (1.05–1.64)*	1.22 (0.96–1.55)	1.37 (1.09–1.72)**
Treatment-related subscale	1.12 (0.88–1.42)	1.19 (0.91–1.55)	1.10 (0.86–1.39)

⁺ $P < .10$; * $P < .05$; ** $P < .01$

Table 3 Multivariate relationships of HIV conspiracy beliefs with unprotected intercourse over the 6-month study time-period (n = 181)

	Any unprotected intercourse odds ratio (95% confidence interval)	Any unprotected intercourse odds ratio (95% confidence interval)
HIV conspiracy beliefs (overall scale)	1.34 (1.04–1.73)*	–
HIV conspiracy beliefs (genocidal subscale)	–	1.34 (1.06–1.69)*
Socio-demographic characteristics		
Low income	0.72 (0.42–1.22)	0.72 (0.42–1.23)
Employed	2.05 (0.99–4.23) ⁺	2.05 (0.99–4.25) ⁺
Heterosexual Orientation	2.96 (1.56–5.63)**	3.02 (1.58–5.75)***
Weeks since baseline survey	1.03 (1.01–1.05)*	1.03 (1.01–1.05)*
Number of completed time-points	1.35 (0.96–1.90) ⁺	1.37 (0.97–1.92) ⁺

⁺ $P < .10$; * $P < .05$; ** $P < .01$; *** $P < .001$

Table 4 Multivariate relationships of HIV conspiracy beliefs with unprotected intercourse with HIV-positive or unknown serostatus partners over the 6-month study time-period (n = 181)

	Any unprotected intercourse (positive/unknown serostatus partners) odds ratio (95% confidence interval)	Any unprotected intercourse (positive/unknown serostatus partners) odds ratio (95% confidence interval)
HIV conspiracy beliefs (overall scale)	1.38 (1.04–1.81)*	–
HIV conspiracy beliefs (genocidal subscale)	–	1.40 (1.11–1.78)**
Socio-demographic characteristics		
Low Income	0.75 (0.43–1.32)	0.75 (0.43–1.33)
Employed	2.09 (0.92–4.71) ⁺	2.01 (0.89–4.51) ⁺
Heterosexual orientation	1.55 (0.71–3.38)	1.77 (0.84–3.73)
Weeks since baseline survey	1.03 (1.01–1.04)**	1.03 (1.01–1.05)**
Number of completed time-points	1.19 (0.82–1.74)	1.17 (0.81–1.70)

⁺ $P < .10$; * $P < .05$; ** $P < .01$

medical mistrust and sexual risk behavior among African American males living with HIV. Consistent with prior research on general public samples of African Americans [11, 12], we found that stronger HIV conspiracy beliefs were associated with a lower likelihood of condom use. Our research extends prior work by using a longitudinal assessment and by surveying people living with HIV. By using repeated measurements over time, we were able to demonstrate a solid and consistent relationship between mistrust and sexual risk over a 6-month period. Although

causality cannot be established based on non-experimental data, our findings suggest that HIV conspiracy beliefs are partially driving risk behavior among Black males living with HIV. Genocidal conspiracies (about the origins of HIV, HIV as a form of genocide, and government withholding of a cure) appear to be at the root of the effect, whereas treatment-related conspiracies may not have a significant influence.

Our results differed by partner serostatus. We found significant associations between conspiracy beliefs and any

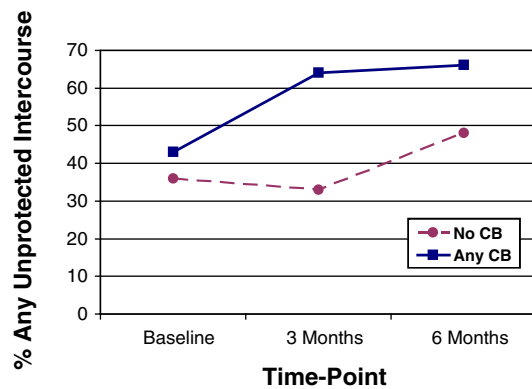


Fig. 1 Percentage of 181 HIV-positive black males reporting any unprotected intercourse in the past 3 months, by level of conspiracy belief (CB)

unprotected intercourse, as well as unprotected intercourse with HIV-positive or unknown serostatus partners. However, we did not find significant relationships between conspiracy beliefs and unprotected intercourse with HIV-negative or unknown serostatus partners. People who hold conspiracy beliefs may be less inclined to trust prevention messages about the risk of intercourse with HIV-positive partners, possibly because such messages are less unified than are those about negative-serostatus partners (e.g., some messages state that condoms should always be used, especially to decrease risk for other sexually transmitted infections, whereas other messages note that re-infection with drug-resistant strains of HIV is unlikely). Further research is needed to clarify the reasons for our findings.

The present study's results serve as a companion to prior work showing a longitudinal relationship between HIV conspiracy beliefs and non-adherence to antiretroviral treatment [13]. Interestingly, in a reverse from the present analysis, this prior work found that treatment-related conspiracies (and not genocidal conspiracies) were significant predictors of the relationship between conspiracies and nonadherence. HIV-specific medical mistrust is a multidimensional construct, and different aspects of such mistrust have distinct implications for prevention versus treatment behaviors. Genocidal beliefs appear to be more harmful to prevention efforts promoting condom use, whereas treatment-related conspiracies may be a greater barrier (and more pertinent) to medication adherence. Individuals who hold beliefs about the genocidal role of the government in the AIDS epidemic may be suspicious of public health prevention messages for an epidemic they believe the government itself created. However, such beliefs may not be as relevant to medication-taking behavior.

In interpreting the results, it is important to note that the convenience sample of Black male study participants is not

necessarily representative of African Americans living with HIV. Furthermore, because the eligibility criteria restricted the study to those on antiretroviral treatment, we were unable to include individuals not engaged in medical care, who are likely to hold more negative attitudes about healthcare and stronger medical mistrust, including conspiracy beliefs. Reports of unprotected intercourse were lower at baseline than at follow-up, which could have been a methodological artifact. Participants, many of whom were relatively inexperienced with computers and medical research, may have initially felt uncomfortable with the ACASI assessment and research study; as they became more familiar with computer use and the research (over multiple assessments), their reports may have become more accurate.

Given the observed relationships of HIV conspiracy beliefs to sexual risk in this analysis, and adherence in prior work, both secondary prevention and treatment interventions for Black males living with HIV need to address cultural issues such as medical mistrust as a root cause of poor self-care. Few culturally relevant prevention interventions exist for African Americans [6, 16], although some promising interventions have been or are being tested. Primary prevention interventions among Black MSM [17, 18] have included components, for example, on overcoming HIV-related myths, and the effects of racism and homophobia on sexual risk. Project EBAN, a prevention intervention for heterosexual sero-discordant African American couples, addressed culturally relevant constructs such as health disparities, discrimination, stigma, and myths about HIV [16, 19].

Conclusions

For greater likelihood of success, HIV interventions need to openly acknowledge factors such as racism that undermine healthcare in Black communities, and to address mistrust and stigma as coping strategies that arise in response to racism and oppression [20]. Insufficient attention to cultural factors may contribute to some behavioral HIV interventions' lack of success [21–24]. Interventions that fail to address causes of mistrust are unlikely to meet African Americans' unique cultural needs and thus may be ineffective.

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