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Are HIV-positive young black MSM having safer sex than those who are HIV-negative?

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Abstract

In the United States, young Black men who have sex with men (YBMSM) bear the single largest burden of the HIV/AIDS epidemic. Whether HIV-positive men in this population practice relatively safer sex than their HIV negative counterparts has not been recently investigated. The purpose of this study was to compare selected sexual risk behaviors between YBMSM who are HIV-positive to their HIV-negative counterparts of the same geographic location in the southern US. A convenience sample of 600 YBMSM completed a computer-assisted self-interview in a private area of a clinic dedicated to sexual health. Frequency/prevalence of 16 sexual risk behaviors was compared between men who were HIV-positive and those who were HIV-negative at the time. Bivariate associations were tested in regression models adjusted for age and having a main male sex partner. One-quarter of the sample (25.5%) was HIV-positive at study enrollment. Remarkably few differences in sexual risk behaviors were observed. HIV-positive men were less likely to report recent sex with a woman (P =.003), and they were more likely to report recent sex with persons known to be HIV-positive (P <.001). Of 16 assessed outcome measures, these two significant findings represented the only significant differences in the adjusted analyses. YBMSM residing in the southern US may experience high levels of HIV exposure risk or risk of exposing others to HIV. A particularly urgent need exists to improve post-diagnostic HIV prevention efforts for HIV-positive YBMSM.

Keywords

AIDS; condoms; homosexual; man; sexual behavior; viral disease

Introduction

In the United States, men who have sex with men (MSM) have the highest incidence and prevalence of HIV.[1–3] Although this population represents approximately 2% of the population, MSM accounted for 69% of all new infections in 2012.[2] The highest incidence

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rates have been observed among young Black MSM (YBMSM).[3–6] YBMSM (defined as ages 18–29 years of old) account for a proportion of new HIV infections among all US MSM that is 100 times larger than their relative population size.[7] YBMSM in the US have a one-in-four chance of becoming infected by age 25.[8] In early 2016, the US Centers for Disease Control and Prevention (CDC) estimated that one of every two Black MSM in the US will acquire HIV in his lifetime.[9] These odds are far worse in the southern US where the majority of the epidemic is occurring.[10]

Evidence suggests that HIV-positive MSM are engaging in condomless anal intercourse with HIV-negative MSM and partners of unknown serostatus.[11] In mixed serostatus samples of MSM, evidence suggests that HIV-positive men are engaging in higher rates of condomless anal intercourse compared to their HIV-negative counterparts.[12] However, findings suggest that many HIV-positive MSM are engaging in safer sex practices such as abstinence, protected anal intercourse, and sex with a seroconcordant partner.[12–14] Unfortunately, few studies have directly compared safer sex behaviors of HIV-positive versus HIV-negative MSM within the same sample.[15–17] Doing so is useful because it serves as an indicator of whether (either with or without intervention) YBMSM living with HIV are taking the added safer sex precautions needed to avoid transmitting the virus to others. Rather than treating this as a repeated measures research question, a between groups design yields what could be stark evidence that HIV-positive YBMSM have exceeded the safer sex behaviors practiced by their HIV-uninfected counterparts who are at-risk of HIV acquisition but not transmission. Accordingly, the purpose of this study was to compare the selected sexual risk behaviors among YBMSM who are HIV-positive to their HIV-negative counterparts of the same geographic location in the southern US. We selected YBMSM because of their extreme level of risk and the dearth of any previous comparisons among this population.

Methods

Study sample

A convenience sample of 600 YBMSM was recruited for participation from a NIH-funded randomized controlled trial (RCT) of a safer sex intervention program designed specifically for this population. This study used only baseline data (collected before randomization and intervention) from that RCT, thus allowing for a comparison of risk behaviors un-confounded by intervention. Participant recruitment occurred in a federally supported clinic designated for the diagnosis and treatment of HIV and other sexually transmitted infections. The clinic was located in a mid-size southern city where incidence rates of HIV are particularly high. Inclusion criteria included: (1) assigned male at birth; (2) self-identification as Black/African American; (3) aged 15 to 29 years; (4) attending the clinic to be tested for HIV or other STIs; (5) having engaged in penile-anal sex with a male partner at least once in the past six months, and (6) the ability to speak and comprehend English.

All age-eligible Black men were approached in the clinic and asked about their interest in volunteering for a HIV prevention study. Those expressing interest were screened for eligibility. A total of 789 men were screened; of these, 623 were eligible. After being offered the opportunity to enroll, 14 declined, yielding an overall participation rate of 97.7%. Nine of the enrolled men participated only as pilot subjects leaving a sample in the trial of 600

YBMSM. All study procedures were approved by the Institutional Review Boards of the University of Mississippi Medical Center, the Mississippi State Department of Health, and the University of Kentucky.

Assessment

After providing written informed consent men completed a computer-assisted online questionnaire in a private office. The questionnaire included 16 items relative to men's sexual risk behaviors (displayed in Tables 1 and 3) in the 90 days prior to enrollment. The assessment of two variables is not self-evident in these tables: condomless insertive anal sex and condomless receptive anal sex. Frequency of condomless insertive anal sex was assessed through two questionnaire items. The first asked men how many times they had sex 'as a Top' in the past 90 days and the second asked how many of those times involved the use of a condom. For men having sex with men as a Top, the value from the second question was subtracted from the value for the first question to create the frequency measure of condomless insertive anal sex. For condomless receptive anal sex, the same procedure was followed, except the question was worded 'as a Bottom…' This questionnaire also asked men to self-report their HIV status. This self-report was subsequently verified by test results from HIV testing, performed at study enrollment, using Clearview® Complete HIV 1/2 (Alere™) or by a standard HIV test processed at the Mississippi State Department of Health Public Health Laboratory (MSDH PHL) in blood specimens.

To control for possible confounding, we assessed whether men had a main partner by asking:

> In the past 90 days, is there one guy who you consider to be a main sex partner (by main partner we mean a person you see often, know well, and have sex with on a regular basis – this is not the same as a side-partner)?

Data analysis

Contingency table analyses were used to determine bivariate associations between HIV status and the dichotomous outcomes. Subsequently, a series of logistic regression models (one for each of 10 dichotomous outcomes) were constructed to control for age and whether men had a main partner. These covariates were entered into the first block (with a 'block' being isolated variable or variables that is pre-determined for order of entry into the model), and HIV status was entered into the second block. Independent groups t-tests were used to evaluate the bivariate associations between HIV status and the outcomes assessed at a continuous level. Finally, a series of linear regression models (one for each of six continuous outcomes) were constructed using the same two-block structure as previously described.

Results

Mean age was 22.62 years, (SD) = 3.2. An average monthly income of less than $1000 was reported by 46.1%. The majority of participants (58.6%) reported that they were currently employed. More than one-half of the samples (59.8%) reported having education beyond high school graduation and 47.3% reported currently enrollment in a school or college. About one-quarter (25.5%) of the men were HIV-positive.

Table 1 displays the observed bivariate associations for the 10 dichotomous outcomes. As shown, two of the outcomes significantly differed between HIV-positive and HIV-negative men. HIV-positive men were less likely to report recent sex with a female, and they were more likely to report recent sex with persons known to be HIV-positive. Results from the adjusted analyses are displayed in Table 2. As shown, controlling for age and whether men had a main sex partner did not alter the findings as observed at the bivariate level.

Table 3 displays the observed bivariate associations for the six continuous outcomes. As shown, two of the comparisons significantly differed by HIV status: frequencies of receptive anal sex and the frequency of condomless receptive anal sex were both significantly less among HIV-positive men. Results from the adjusted analyses are displayed in Table 4. As shown, controlling for age and whether had a main sex partner did alter the two significant findings observed at the bivariate level. In both cases, the findings became non-significant in the presence of the two covariates. Of interest, the one marginal ($P = .09$) bivariate association pertaining to less frequent condomless insertive anal sex remained non-significant in the presence of the covariates.

Discussion

With some exceptions, the findings demonstrate remarkable similarity in sexual risk and protective behaviors between YBMSM who are HIV-positive compared to those not living with HIV. Because the level of risk for HIV acquisition/transmission was substantial for all 16 measures, the lack of significant differences favoring those who are HIV-positive is concerning. One limitation, however, involves the lack of data regarding HIV treatment status and HIV viral load during the 90 days prior to enrollment. Men who were aware of adequate viral suppression may have been engaging in risk behavior based on perceptions of safety stemming from that information.

Unfortunately, the strong promotion of PrEP and ART use in the US has overshadowed the past emphasis on promoting safer sex for those living with HIV/AIDS. Ideally, both strategies (PrEP and safer sex for those who are HIV-negative and the use of ART combined with safer sex for those who are HIV-infected positive) would be used in harmony. The overwhelmingly null findings of our study suggest that efforts to intensify safer sex promotion programs for HIV-positive YBMSM are urgently needed in the southern US (where most of the US epidemic is occurring).[10]

Although this study, to the best of our knowledge, is the first to compare such a large number of sexual risk behaviors between YBMSM based HIV-serostatus, some interesting similarities/differences exist with studies of other populations that focused on unprotected sex. Our null findings lie in stark contrast to a 2005 meta-analysis of persons aware and unaware of their HIV status that found an overall 53% lower rate of unprotected anal/vaginal sex among those aware of their status.[18] Alternatively, the null findings contrast favorably to two far more recent studies suggesting that HIV-positive MSM engage in more frequent condomless anal sex than their HIV-negative counterparts.[11,15] Finally, our null findings relative to condomless anal sex are consistent with a study of over 800 Black MSM.[14]

The concept of focusing intervention resources on persons living with HIV is one that has been widely advocated by the US government and prominent scholars in the field of HIV prevention.[19–21] For instance, the US. National HIV/AIDS Strategy broadly endorses an emphasis on intervention efforts aimed specifically towards persons living with HIV.[20] Unfortunately, a recent review of clinic-based HIV prevention programs for minority populations found an absence of tested interventions for MSM,[22] and only one of the CDC-designated evidence-based prevention programmes is designed for Black MSM who are living with HIV.[23]

Limitations

Findings are limited by the use of a convenience sample and the validity of men's self-reported data. A further limitation is that the frequency of sexual-risk taking in a clinic-based population, such as this one, may be substantially greater than that occurring for YBMSM not attending an STI/HIV clinic; thus, the findings may not be generalizable to the broader population of YBMSM. Findings are limited by the lack of an event-level (partner-by-partner) analysis that would have allowed for identification of sexual risk behaviors occurring in believed concordant pairings. Alternatively, a key strength of the study is the broad spectrum of sexual risk behaviors that were assessed as outcomes, thus providing a more in-depth examination of possible differences between HIV-positive and HIV-negative YBMSM.

Conclusion

YBMSM residing in the southern US may experience high levels of HIV exposure risk or risk of exposing others to HIV. That HIV-positive YBMSM were generally as likely to report sexual risk behaviors matching those of their HIV-negative counterparts suggests a need to improve post-diagnostic HIV prevention efforts for HIV-positive YBMSM. A more intensive approach to HIV prevention for HIV-positive men, however, should not displace ongoing efforts to reduce the levels of sexual risk among HIV-negative YBMSM.

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Table 1

Bivariate associations between HIV status and selected dichotomous outcomes assessed during the past 90 days among young black MSM.

Outcome	HIV-negative n/total (%)	HIV-positive n/total (%)	*P*
Any recent unprotected anal insertive sex	120/422 (28.4)	29/120 (24.2)	.35
Any recent unprotected anal receptive sex	114/316 (36.1)	38/115 (33.0)	.56
Multiple partners as a (TOP)	185/343 (53.9)	60/113 (53.1)	.88
Multiple partners as a (BOTTOM)	173/317 (54.6)	70/115 (60.9)	.24
Did not use condoms with main partner	73/257 (29.1)	18/86 (20.9)	.14
No condom last anal sex with side partner	20/158 (12.7)	8/55 (14.5)	.72
Received ejaculate rectally at least once	115/282 (40.8)	53/107 (49.5)	.12
Sex with one or more females	104/469 (22.2)	16/140 (11.4)	.005
Concurrent sex partners	116/343 (25.3)	38/99 (27.7)	.56
Sex with one or more HIV-positive partners	83/459 (18.1)	53/137 (38.7)	<.001

Table 2

Adjusted associations between HIV status and selected dichotomous outcomes assessed during the past 90 days among young black MSM.

Outcome	AOR	95% CI	*P*
Any recent unprotected anal insertive sex	.75	.47–.121	.24
Age	1.02	.96–1.09	.48
Main sex partner	.48	.32–.72	<.001
Any recent unprotected anal receptive sex	.80	.50–1.28	.35
Age	1.02	.95–1.098	.61
Main sex partner	.50	.32–.76	.001
Multiple partners as a (TOP)	.99	.64–1.52	.96
1Age	.97	.92–1.03	.34
Main sex partner	1.16	.80–1.69	.43
Multiple partners as a (BOTTOM)	1.34	.86–2.07	.20
Age	.99	.93–1.05	.77
Main sex partner	1.40	.94–2.08	.09
Did not use condoms with main partner	.64	.35–1.15	.14
Age	1.01	.94–1.10	.73
No condom last anal sex with side partner	1.15	.47–2.85	.76
Age	.88	.77–1.02	.08
Main sex partner	.61	.25–1.47	.27
Received ejaculate rectally at least once	1.39	.88–2.20	.16
Age	.97	.92–1.04	.43
Main sex partner	.55	.36–.84	.006
Sex with one or more females	.38	.21–.71	.003
Age	1.08	1.01–1.15	.03
Main sex partner	1.01	.65–1.54	.98
Concurrent sex partners	.97	.62–1.50	.88
Age	.94	.89–.99	.04
Main sex partner	1.59	1.09–2.33	.02
Sex with one or more HIV-positive partners	2.70	1.80–4.13	<.001
Age	1.09	1.02–1.16	.006
Main sex partner	1.12	.75–1.66	.59

Table 3

Bivariate associations between HIV serostatus and selected continuous outcomes assessed during the past 90 days among young black MSM.

Outcome	Mean	*t*	df	*P*
Frequency of anal receptive sex				
HIV-negative	7.64	2.29	428.9[a]	.02
HIV-positive	5.15			
Frequency of anal insertive sex				
HIV-negative	4.08	.79	598	.43
HIV-positive	4.83			
Number of male partners who were BOTTOMs				
HIV-negative	2.08	.99	595	.32
HIV-positive	2.48			
Number of male partners who were TOPs				
HIV-negative	2.51	.09	592	.94
HIV-positive	2.46			
Frequency of condomless anal receptive sex				
HIV-negative	2.72	2.12	429.0[a]	.03
HIV-positive	1.35			
Frequency of condomless anal insertive sex				
HIV-negative	1.40	1.67	359.7[a]	.09
HIV-positive	.88			

[a]Based on failed Levine's test, an unequal variances method was used, this also yields adjusted degrees of freedom.

Table 4

Adjusted associations between HIV serostatus and selected continuous outcomes assessed during the past 90 days among young black MSM.

Outcome	Beta	*t*	*P*
Frequency of anal receptive sex	−.08	−1.66	.10
Age	.03	.55	.58
Main sex partner	−.03	−.55	.57
Frequency of anal insertive sex	.02	.51	.61
Age	.09	2.16	.03
Main sex partner	−.02	−.53	.59
Number of male partners who were BOTTOMs	.04	1.01	.31
Age	.00	−.08	.93
Main sex partner	.02	.52	.60
Number of male partners who were TOPs	.00	.00	.99
Age	.00	.01	.99
Main sex partner	.05	1.19	.23
Frequency of condomless anal receptive sex	−.07	−1.52	.13
Age	.00	−.12	.91
Main sex partner	−.08	−1.62	.11
Frequency of condomless anal insertive sex	−.07	−1.54	.12
Age	.06	1.49	.14
Main sex partner	−.12	−2.90	.004