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Title of the Article

Are partner race and intimate partner violence associated with incident and newly diagnosed HIV infection in African-American men who have sex with men?

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Running Head

HIV Risk Factors among Black MSM

KEYWORDS

Black MSM; HIV; Intimate Partner Violence; Partner-Level Factors

ABSTRACT

Black gay, bisexual, and other men who have sex with men (BMSM) experience a disparate rate of HIV infections among MSM. Previous analyses have determined that STI coinfection and undiagnosed HIV infection partly explain the disparity. However, few studies have analyzed the impact of partner-level variables on HIV incidence among BMSM. Data were analyzed for BMSM who attended the Los Angeles LGBT Center from August 2011 to July 2015 (n = 1,974) to identify risk factors for HIV infection. A multivariable logistic regression was used to analyze predictors for HIV prevalence among all individuals at first test (n = 1,974; entire sample). A multivariable survival analysis was used to analyze predictors for HIV incidence (n = 936; repeat tester subset). Condomless receptive anal intercourse at last sex, number of sexual partners in the last 30 days, and IPV were significant partner-level predictors of HIV prevalence and incidence. Individuals who reported IPV had 2.39 times higher odds (CI: 1.35-4.23) and 3.33 times higher hazard (CI: 1.47-7.55) of seroconverting in the prevalence and incidence models, respectively. Reporting Black partners only was associated with increased HIV prevalence, but a statistically significant association was not found with incidence. IPV is an important correlate of both HIV prevalence and incidence in BMSM. Further studies should explore how IPV affects HIV risk trajectories among BMSM. Given that individuals with IPV history may struggle to negotiate safer sex, IPV also warrants consideration as a qualifying criterion among BMSM for pre-exposure prophylaxis (PrEP).

INTRODUCTION

Black gay, bisexual, and other men who have sex with men (MSM) have a higher incidence and prevalence of HIV when compared to White MSM[1-3] despite consistent evidence of similar or lower rates of sexual risk and drug risk behaviors.[1,2,4-8] The only consistent correlates of Black MSM's increased HIV infection risk compared to other MSM in meta-analyses have been a higher prevalence of sexually transmitted infections (STIs) and a greater proportion of undiagnosed HIV infection.[4,5] However, research has increasingly focused on the possibility that confined sexual networks and psychosocial factors may also contribute to the disparities in HIV incidence and prevalence.

Segregation and sexual racism have led to a greater insularity of sexual networks among Black MSM.[9-11] Millett et al. found that Black MSM had 11.5 times greater odds of reporting Black sex partners when compared to other MSM.[12] Studies in Atlanta,[13] New York,[14] and San Francisco[9] have also shown that Black MSM are more likely than non-Black MSM to have Black sex partners. A study by Hernandez-Romieu et al. found that HIV prevalence among Black MSM sexual networks was 36% compared to only 4% among White MSM sexual networks.[15]

Previous studies have used these findings to propose that higher HIV incidence and prevalence among Black MSM may be explained by same race[1,3,16-19] or older partners.[1,7,16,20,21] However, other analyses have contested the relationship between HIV incidence and partner race[22] or partner age.[22,23] An analysis of the National HIV Behavioral Surveillance System found that sexual networks were not influential in explaining the HIV disparity between White and Black MSM. More specifically, the only significant difference was that Black MSM newly diagnosed with HIV were more likely to report that their last male partner had an unknown HIV status when compared to White MSM who were newly diagnosed.[24] However, the previous

analyses mainly analyzed between group differences between White and Black MSM as opposed to determining within group differences for HIV infection among Black MSM.

Psychosocial risk factors like intimate partner violence (IPV) may also play a role in HIV risk behavior. A meta-analysis by Buller et al. found that IPV among MSM was associated with an increased risk of substance use and engagement in condomless anal intercourse (CAI).[25] Among a sample of YMSM, Stults et al. found that IPV was associated with between a 1.8-2.5 greater odds of using stimulants[26] and a two-fold greater odds of condomless receptive anal sex.[27] In contrast, Williams et al. found that Black MSM experienced both high rates of childhood sexual abuse (41%) as well as IPV (52%), but they did not find a significant association between IPV and HIV risk behaviors.[28] However, no other studies to our knowledge have explored the specific relationship between IPV and HIV incidence. In addition, few studies have followed HIV-negative, Black MSM over time to determine what predicts HIV seroconversion within this racial subgroup. The objective of this study is to determine the impact of partner race and IPV on HIV incidence and prevalence among Black MSM while controlling for well-established predictors of HIV infection such as STI history and condom use.[4,5]

METHODS

The Los Angeles LGBT Center (the Center) is a federally qualified health center headquartered in the Hollywood neighborhood of Los Angeles, California. Free HIV/STI testing and treatment are provided at both the main location as well as a satellite facility located in West Hollywood, California.

Between January 2011 and July 2015, each HIV/STI testing client was administered an 82-item risk assessment in a face-to-face interview that asked questions on demographics, substance use, sexual risk behavior, and partner characteristics. Partner characteristics included

145age of the last two sexual partners, race/ethnicity of the last two sex partners, and whether the
146client had ever experienced intimate partner violence (never, ever, past year, or past three
147months).

148 Following this questionnaire, all clients were offered testing for STIs including
149gonorrhea, chlamydia, and syphilis in addition to HIV screening. Clients who elected for STI
150screening were instructed to self-collect urine and rectal samples for gonorrhea and chlamydia
151testing. Following self-collection, a laboratory technician swabbed the throat for gonorrhea
152testing and administered a blood test for both syphilis testing (rapid plasma regain) and HIV
153testing. The primary HIV test was used to determine presence of HIV antibody (OraQuick
154ADVANCE® Rapid HIV-1/2 Antibody Test, OraSure Technologies, Inc., Bethlehem, PA). For
155individuals who tested antibody-negative, the blood sample was used to test for acute infection
156(presence of virus but absence of antibody which is indicative of a recent HIV infection) via
157nucleic acid amplification testing (Aptima HIV-1 RNA Qualitative assay, Hologic, Inc., Bedford,
158MA). For individuals who tested antibody-positive, a second rapid test was used to confirm
159infection (Uni-Gold™ Recombigen® HIV-1/2 antibody test, Trinity Biotech, Wicklow, Ireland).
160If the second rapid was positive, the individual was referred to an internal linkage-to-care
161specialist who facilitated the transition to HIV care. If the second rapid was discordant from the
162first positive, the client was advised that their result was indeterminate and that they would be
163subsequently contacted once the NAAT result was received. Individuals who were antibody
164negative and NAAT positive were also referred to a linkage-to-care specialist to initiate HIV
165care.

166 Individuals were included in this analysis if they met the following inclusion/exclusion
167criteria: 1) birth gender and current gender identity of male (cisgender males); 2) gay or bisexual

identity or ever reported sex with a man (MSM or MSMW) or transgender person (men who have sex with transgender persons, or MST) (all subsequently referred to as MSM); 3) racial identity of Black or African-American (subsequently referred to as Black), regardless of concurrent identification with another race or ethnicity; 4) self-report at their baseline visit that their last HIV test result was negative and 5) received at least one HIV test at either the main location or West Hollywood satellite location during the analysis period.

Statistical Methods

We analyzed two distinct groups of data/subjects. The first analysis group included all individuals who tested for HIV during the analysis period (entire population, n = 1,947). The second group is a subset, comprising all individuals who tested for HIV two or more times during the analysis period (repeat testers subset, n = 936). All predictors used in our analyses were assessed at the client's first visit in the analysis period (baseline visit).

For the entire sample at their baseline visit, chi-square tests of association and multivariable logistic regressions were used to determine characteristics that distinguished newly diagnosed HIV-positives from those testing HIV-negative. For the repeat testers subset, bivariate and multivariable survival analyses were used to determine baseline predictors that distinguished individuals who later tested HIV-positive from those who tested HIV-negative through their final testing visit in the analysis period.

The multivariable logistic and survival models were built in one step and included predictors significant in the bivariate models at an alpha level less than or equal to 0.05. Any predictor significant in either the bivariate logistic or bivariate survival model was retained for both multivariable models. All analyses were performed using SAS version 9.4 (SAS Institute, Cary, NC).

Ethics

The study received approval from the University of California, Los Angeles South General Institutional Review Board (SGIRB) (IRB Number: 00004474; Project Number: 16-000654).

RESULTS

Of the 1,947 individuals included in the analysis, 135 were HIV+ at their first test for a positivity rate of 6.9% (SE = 0.58%; 95% CI = 5.8%-8.1%). Another 41 out of 936 in the repeat testers subset were diagnosed as HIV-positive within the study period over 1585.03 person-years of follow-up for an HIV positivity rate of 2.59 HIV infections per 100 person-years. Of the 176 HIV infections in the entire sample, 155 HIV infections (88%) were non-acute infections.

Entire Sample Baseline Testing Analysis

Among the entire sample at baseline, individuals were more likely to test HIV-positive if they were under the age of 30 in bivariate analyses (**Table 1**). A self-reported history of STIs either in the past year or more than a year ago was significantly associated with testing HIV-positive (**Table 2**). Reporting insertive anal sex at last sex was not associated with testing HIV-positive, but reporting receptive anal sex at last sex was associated with testing HIV-positive, regardless of reported condom use (**Table 3**). Approximately 15% of all individuals who reported that their last two sex partners were Black tested HIV-positive compared to only 6% who reported at least one non-Black sex partner in their last two sexual experiences. Approximately 20% of individuals who reported a lifetime history of IPV tested HIV-positive compared to only 8% of individuals who did not report a history of IPV. The only substances that were significantly associated with testing HIV-positive among the entire sample were methamphetamine use in the past 12 months and alcohol use before/during sex (**Table 4**).

Younger age, testing positive for any STI at baseline, condomless receptive anal intercourse at last sex, Black race of last two sex partners, number of sex partners in the last 30 days, IPV, and alcohol use before/during sex were associated with testing HIV-positive for the entire sample in the multivariable analysis (**Table 5**). When compared to individuals who reported only non-Black sex partners for their last two sexual experiences, individuals with two Black sex partners had a 2.57 (95% CI: 1.67-3.93) increased odds of testing HIV-positive. Similarly, individuals who reported a history of IPV had a 2.39 (95% CI: 1.35-4.23) increased odds of testing HIV-positive when compared to individuals who did not report a history of IPV.

Repeat Testers Subset

Sexual orientation, partner type, and age group at baseline were not significantly associated with seroconversion at follow-up for the repeat testers subset in bivariate analyses. There was no significant relationship between self-reported history of STIs and HIV incidence for the repeat testers subset, but individuals who tested positive for an STI at baseline had a higher hazard of testing HIV positive at follow-up. The only substances significantly associated with HIV seroconversion were ecstasy and nitrate use in the 12 months prior to the baseline visit.

The only variables associated with seroconversion in a multivariable model were condomless receptive anal sex, number of sexual partners in the last 30 days, and reporting a history of IPV. The hazard of seroconversion increased by 7% for each additional sexual partner reported in 30 days prior to the baseline visit (95% CI: 1.02-1.12). Individuals with a history of IPV had factor of 3.33 (95% CI: 1.47-7.55) greater hazard of testing HIV-positive at follow-up compared to individuals without a history of IPV.

DISCUSSION

240 We conducted two analyses on data from Black MSM to determine the circumstances
241associated with newly diagnosed HIV infection (HIV prevalence) among the entire HIV testing
242population and with incident HIV infection among repeat testers who subsequently tested
243positive. Condomless receptive anal intercourse, number of sex partners in the last 30 days, and
244IPV were consistent predictors of HIV infection in both the entire population and the repeat
245testers' subset. Additional risk factors were identified for the entire population, including
246younger age, testing positive for an STI at baseline, Black race of last two sex partners, and
247alcohol use prior to sex.

248 Condomless receptive anal intercourse and number of sex partners are well-established
249predictors of HIV among Black MSM.[4,5] However, the link between IPV and HIV among Black
250MSM is less clear. There has been inconsistent evidence linking IPV to sex- and drug-related risk
251factors for HIV in this group.[25-28] Our study is the first to find direct associations with HIV
252infection, including HIV incidence. The mechanism for the relationship between IPV and HIV is
253indirect. IPV can take many forms from physical violence to emotional manipulation to
254monitoring a partner's behavior. HIV risk could be hypothetically heightened through reduced
255self-efficacy in negotiating safer sex or a lack of power to suggest monogamy. For example, an
256individual may admit to IPV but not admit that they were forced to have unprotected receptive
257anal sex with a non-monogamous partner. Clinics serving Black MSM may consider adding IPV
258as an indicator for pre-exposure prophylaxis (PrEP) since victims may not have the agency to
259negotiate safer sex.

260 Individuals who were diagnosed with HIV infection were more likely to report that both
261of their last sex partners were Black when compared to their peers who reported non-Black
262partners only. In 2015, the CDC estimated that approximately 13% of all individuals with HIV

263were unaware of their infection,[29] but studies among Black MSM have shown that this proportion
264can be between 18% and 25%.[18,30] Given that HIV prevalence and rate of unknown infections are
265both high among Black MSM, it is not surprising that partner race is associated with HIV risk.
266What is surprising is that MSM in our study population with one Black and one other race
267partner experienced HIV risks similar to those who had non-Black partners in their last two
268sexual experiences. It is quite possible that Black MSM with multi-racial, rather than Black only,
269sexual partner networks are generally engaged with MSM whose HIV risk is relatively low and,
270for those who are HIV-positive, HIV care engagement is relatively high. However, this
271hypothesis warrants testing.

272 This analysis has a number of limitations. First, although an individual reported that they
273were HIV-negative at baseline, it is possible that some individuals who tested HIV-positive were
274already aware of their status. Los Angeles County surveillance data were used to determine if an
275individual tested positive at another publicly funded clinic prior their first test in the study
276period. Individuals were dropped that had a prior positive result on file (n = 5). Although, the
277remaining individuals in our study could have tested positive at a private site, in another county,
278or outside the state/country it is unlikely that this affected more than one or two testers.
279Determining all individuals who are truly newly diagnosed HIV infections would only be
280possible with both State and Federal surveillance data that were not available for this analysis.
281Second, the Los Angeles LGBT Center and its satellite location are located in areas with low
282percentages of Black residents. For this reason, the risk factors of the individuals who tested
283positive may not be representative of the overall trends for Black men in either Los Angeles
284County or in other jurisdictions. Conversely, a potential advantage of being located out of these
285areas is that individuals may feel less stigma in coming to test. Third, we used a single question

286to ask about IPV due to time constraints of a risk assessment used in an STI/HIV testing clinic
287setting. Therefore, we were unable to distinguish between emotional, mental, and physical forms
288of IPV. Fourth, risk assessments were conducted in face-to-face interviews which may have
289introduced more social desirability bias than present in computer-assisted interview methods.
290Lastly, while the overall sample size for this analysis was large, there was only a modest number
291of seroconversions in the multiple testers category.

292 In 2015, Mustanski et al. opined, “racial disparities in HIV may be driven and/or
293maintained by a combination of racial differences in partner characteristics, assortativity by race,
294and increased sexual network density, rather than differences in individual's HIV risk
295behaviors.”[31] Assortativity by race/ethnicity is common across racial/ethnic groups, and this
296finding does not provide much-needed, actionable public health strategies for reducing HIV risk
297in Black MSM. In contrast, the IPV association is intervenable and resources should be allocated
298to both assessment of IPV as well as programs that assist victims of IPV with prevention
299interventions like PrEP and other wrap-around services. By looking at partner- and network-level
300factors, instead of focusing on risk at the individual-level, public health interventions will be able
301to better serve Black MSM in future HIV prevention efforts.

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