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Differing identities, but comparably high HIV and bacterial sexually transmitted disease burdens, among married and unmarried men who have sex with men in Mumbai, India

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Abstract

Background—Although HIV incidence has declined in India, men and transgender women who have sex with men (MSM) continue to have high rates of HIV and STD. Indian MSM face substantial pressures to marry and have families, but the HIV/STD burden among married Indian MSM is not well-characterized.

Methods—A diverse sample of Indian MSM was recruited through respondent driven sampling (RDS). Independent variables that produced a p-value of 0.10 or less were then added to a multivariable logistic regression model.

Results—Most of the 307 MSM (95 married, and 212 unmarried) recruited into the study were less than 30, and less than 1/3 had more than a high school education. Almost two thirds of the married men had children, compared to 1.4% of the unmarried men ($p<0.001$). The numbers of condomless anal sex acts did not differ by marriage status. Although unmarried MSM more often identified themselves as “kothi” (receptive role), their rates of HIV or bacterial STD were similar to married MSM, with 14.3% being HIV-infected. The RDS-adjusted prevalence of any bacterial STD was 18.3% for married MSM and 20% for unmarried MSM (NS). Participants reported high levels of psychological distress, with 27.4% of married and 20.1% of unmarried MSM reporting depressive symptoms (NS).

Conclusions—MSM in Mumbai had high rates of HIV, STD and behavioral health concerns. Clinicians need to become more comfortable in eliciting sexual histories so that they can identify MSM who need HIV/STD treatment and/or prevention services.

Keywords

men who have sex with men; sexually transmitted infections; HIV; India

Introduction

Although the first cases of HIV that were reported in India were among female sex workers in 1986 (1), and the epidemic continues to be perceived as a heterosexual epidemic, men who have sex with men (MSM) are disproportionately impacted by HIV (2, 3). Recent estimates from the National AIDS Control Organization (NACO) of India suggest that the overall population prevalence of HIV among Indian MSM is 7.4%, compared to 0.34% for the general population [4]. Other HIV prevalence studies have found rates of HIV as high as 18% in recent years. [5–7]. At The Humsafar Trust, the largest voluntary testing and counseling site focusing on sexual and gender minority populations in Mumbai, 12% of MSM testers were found to be HIV-infected (8). Because India has the second largest population of any nation, it is home to one of the largest groups of MSM globally, so understanding the spread of HIV and other sexually transmitted diseases (STD) in this subpopulation has major public health significance.

However, obtaining population-based estimates of HIV/STD prevalence in Indian MSM is challenging since MSM in Indian society face many social challenges, including pressures to marry women and to raise a family (9). Homosexual behavior has been criminalized since the days of the British occupation with the Penal Code 377 ruling being recently upheld by the Indian Supreme Court. Moreover, the expression of sexuality and gender identity in India may be quite complex (10). Some individuals may be identified as “Kothi,” because of appearing and acting feminine, and usually being receptive when engaging in anal sex [11]. “Panthis” are men who are masculine-appearing, and who are predominantly the insertive sexual partner. Other terms have been used to describe other subgroups, such as “double-decker,” referring to MSM who engage in both insertive and receptive anal sex, and “gay,”

referring to Western-acculturated MSM. Because many prevention efforts are focused on outreach to readily identifiable MSM, some key populations may not be adequately engaged (12, 13). In particular, because of high levels of marriage pressure, MSM who are married to women and who appear to take the “Panthi” role may be least likely to be reached by HIV prevention campaigns, and their HIV and STD burden has not been fully characterized (14). The purpose of the current study was to assess whether there were differences in HIV/STD prevalence between married and unmarried MSM, and to assess whether socio-demographic or behavioral characteristics differed among these subgroups of MSM, which could have implications for future screening and prevention interventions.

Methods

Participants and Procedures

This protocol was reviewed by the independent ethical review boards of Fenway Health in Boston, The Humsafar Trust in Mumbai, India, and the National AIDS Research Institute in Pune, India, in concordance with national guidance in each of the respective countries. Participants were recruited by members of their social and sexual networks to participate in the study at The Humsafar Trust in Mumbai, a non-governmental, community-based organization dedicated to the sexual health and human rights of MSM and gender minorities (www.humsafar.org). Participants were asked to complete a one-time, confidential behavioral health survey which was administered in English or Hindi by a trained interviewer. Then they underwent screening for syphilis using the rapid plasma reagent test (RPR), HIV serologic testing using a NACO-approved rapid test. First-catch urine specimens, and rectal and oral pharyngeal swabs were collected for all participants to be tested for *Neisseria gonorrhoeae* and *Chlamydia trachomatis* using the Gen-Probe™ nucleic amplification assay (Hologic, San Diego, Ca.). All biological specimens were transported to the National AIDS Research Institute (NARI) reference lab in Pune, India where the assays were performed, and reactive syphilis serologies were confirmed by treponeme-specific tests. Participants were given culturally appropriate risk-reduction counseling as well as specific education about HIV and STI prevention. Participants who tested positive for HIV or STD were referred locally for treatment.

The recruitment methodology entailed the use of respondent-driven sampling [15, 16]. Based on power calculations to detect a significant difference in prevalence of HIV infection between married and unmarried MSM, the target sample size was 300 participants. Fifteen individuals were initially selected as “seeds”; 10 of the seeds were married to women, and five were unmarried MSM. They were recruited by peers at the Humsafar Trust with the intention of generating a sample that was diverse in socioeconomic status, sexual identity, numbers of male sexual contacts, geography, and age. The seeds were asked to recruit three additional MSM from their social network, who would agree to be interviewed and provide biological samples. Study eligibility entailed being 18 years of age or older, and self-reporting in engaging in any anal intercourse, receptive or insertive, with other men in the three months prior to study enrollment. Participants were incentivized for study enrollment (450 Rupees) and for making referrals in order to achieve a sufficiently large referral chain (150 Rupees per completed referral).

All study procedures were approved by the Institutional Review Boards at The Fenway Institute, Fenway Community Health in Boston, The Humsafar Trust IRB and NARI IRB.

Measures

Demographic and Social Factors—Information was collected on participants' age, income, education level, employment, and MSM subgroup identity (e.g., *kothi*, predominantly receptive partners in anal and oral sex; *panthi*, predominantly insertive partners; and *double deckers*, both insertive and receptive partners). Additionally, participants reported whether or not they were born in Mumbai, and whether they had any children. Marital status was collected and dichotomized into currently married vs currently unmarried. Participants were also asked whether or not they had been circumcised.

Behavioral Characteristics—Participants reported, in the past 3 months, the number of times they had anal sex, the number of times they had anal sex without a condom, the number of times they had oral sex with a male partner and the total number of sexual partners they had.

Network Characteristics—Participants were asked to report the age, employment status, religion, marital status and birthplace (Mumbai vs. somewhere else) for their most recent main and casual partner. Dissortative mixing was determined if the participant differed from the most recent partner on each of these characteristics.

Psychosocial Assessments—Depressive symptoms were assessed using the CES-D 10 – a shortened version of the 20-item Center for Epidemiologic Studies Depression Scale, a validated survey of clinically significant distress as a marker for clinical depression (17) which has previously been translated for use in India. The 10-items were scored on a 4-point Likert scale from 0 to 3, with a score of 10 or greater suggestive of clinically significant depressive symptoms. The Mini International Neuropsychiatric Interview (18) was used to assess current suicidality. The SPAN (Startle, Physically upset by reminders, Anger, and Numbness) screen was used to assess current post-traumatic stress disorder (PTSD) symptomology (19). Endorsement of 3 or 4 of the 4 symptoms was suggestive of PTSD. Self-esteem was assessed using the Rosenberg Self-Esteem Scale (20). A score of less than 15 indicates low self-esteem. To measure social support, participants were asked the number of people they know by name as well as the number of friends that can be called upon for help if needed. Finally, substance use was assessed by asking participants how often they have a drink containing alcohol, and how often they used cannabis in the past 3 months.

Data Analysis

Data analysis excluded seeds from analysis per Respondent Driven Sampling (RDS) procedures (15,16), but additional analyses were performed which included the seeds in order to see whether this would change the outcomes of interest. In order to make valid, unbiased inferences, the RDS sampling weights for married and non-married men were applied to all analyses using SURVEY procedures in SAS (v 9.3) [21]. The respondent-driven sampling adjusted proportions for HIV and STD prevalence were calculated. Univariable logistic regression analyses were performed to examine factors associated with

being married. Additionally, univariable logistic regression analyses were performed to examine factors associated with a prevalent HIV infection. For each outcome, factors that produced a p-value of 0.10 or less in univariable regressions were then added to multivariable logistic regression models. All multivariable logistic regression models were additionally adjusted for age, education, household income and sexual identity. Odds ratios (OR) and 95% confidence intervals (CI) are reported.

Results

Fifteen MSM seeds recruited 292 additional participants into the study, for a total of 95 married MSM and 212 unmarried MSM. The mean age of the married men was 30.9 years and of the unmarried men 23.7 years, which was significantly different (Table 1).

Approximately two-thirds of the participants were Hindu and slightly less than 30% were Muslim. Less than one quarter of the men were circumcised. Married and unmarried MSM did not differ according to education and household income. Married MSM were more likely to be employed than unmarried MSM, but differences in race, ethnicity and circumcision status were not significantly different. Married MSM were more likely than unmarried MSM to be born in Mumbai (56.8% vs. 49.2%, respectively) and were much more likely to be fathers (65.3% vs 1.4%, respectively).

The total mean number of reported anal intercourse acts in the prior three months (approximately 10) was comparable between the married and unmarried MSM, as was the number of condomless anal sex acts (Table 2). The only major difference in terms of the sexual variables was that unmarried MSM were much more likely to identify as Kothi than married MSM, but it is still notable that slightly more than a quarter of the married MSM identified with this “feminine” receptive role. Additionally, 7.5% of married MSM and 4.8% of unmarried MSM did not feel like the terms describing sexual identity applied to them, and 5.3% of married MSM and 20.2% of unmarried MSM didn’t know how their sexual identity should be described.

Both married and unmarried MSM experienced high level of stress and behavioral health concerns (Table 3). Overall, almost a quarter of the MSM screened in for depressive symptoms. Married MSM were slightly more likely to report depressive symptoms than unmarried MSM, but this was not a statistically significant difference. More than one-fifth of the married and unmarried MSM expressed suicidal ideation, and more than 10% expressed symptoms consistent with post-traumatic stress disorder. More than one-fifth of men also expressed low self-esteem. The social networks, including the number of people they could call on for help, were comparable between the married and unmarried MSM. Rates of frequent alcohol or cannabis use tended to be low in both groups.

Married and unmarried MSM did not differ in rates of dissortative mixing with their last casual or primary partner based on age, employment, religion, marital status or birth in Mumbai. In final multivariate logistic regression analysis (data not shown), married MSM were more likely to be employed with an adjusted-odds ratio of 6.8 (95% CI: 1.0– 46.2) but otherwise did not differ from unmarried MSM.

In terms of STD prevalence, infection rates were similar between married and unmarried MSM (Table 4). Using the respondent-driven sample adjustment, the HIV prevalence was 14.4% for married MSM and 14.3% for unmarried MSM. Syphilis rates tended to be higher among the unmarried MSM (8.3%) compared to married MSM (1.0%), but this was not statistically significant. Gonorrhea prevalence among unmarried MSM was 5.3% and 8.5% among married MSM, and the Chlamydia prevalence was 9.2% among unmarried MSM and 14.0% among married MSM. When assessed for the presence of any bacterial STD, 18.3% of the married MSM had at least one bacterial STD and 20% of the unmarried MSM had at least one STD.

In multivariate analyses, compared to HIV-uninfected MSM, HIV-infected MSM were significantly more likely to be older (aOR=1.15; 95% CI 1.05–1.26; P=0.002) and to have gonorrhea (aOR=13.89; 95% CI 1.95–99.15; P=0.009). HIV-infected MSM were also more likely than HIV-uninfected MSM to be married (aOR=3.62; 95% CI 0.72–18.14; P=0.118), to go to a social setting where MSM hung out (aOR=7.21; 95% CI 0.63–82.34; P=0.112), and to meet a partner at the beach (aOR=3.09; 95% CI 0.82–11.65; P=0.096); however, these differences were not statistically significant. HIV-infected and uninfected MSM did not differ by other demographic or socio-behavioral factors.

Discussion

The HIV epidemic is showing an overall decline in India while MSM continue to remain at increased risk for HIV acquisition and transmission (4). The declining HIV prevalence in the general Indian population may be partially due to several factors, including increased testing, the scale up of antiretroviral treatment, and wide dissemination of targeted prevention interventions for some high risk sub-populations, such as female sex workers (22). However, the coverage of HIV treatment and prevention services for MSM remains comparatively low (23). Additionally our study reveals that HIV-infected MSM are more likely to have bacterial STD which may potentiate HIV spread. In the current study of married and unmarried Mumbai MSM recruited through respondent-driven sampling, HIV and STD prevalence was quite high compared to the general population, but did not differ significantly by marital status. Although married MSM less often identified as Kothi and more often identified as a double-decker, their frequency of condomless anal sex was similar to unmarried MSM. Although these findings are based on cross-sectional data and cannot be interpreted causally, they underscore the need for Indian clinicians to base their HIV and STD screening practices on knowledge of patients' behavior, as opposed to presumptions regarding external appearances (i.e. feminine appearing) or social history (i.e., marital status) (24).

Of particular note are the high levels of depression and other psychological distress in both groups, which is similar to findings noted in other studies of Indian MSM (25,26). Because of familial expectations that heterosexual marriage is the norm in Indian society, unmarried MSM may experience psychological distress given the challenges of disappointing relatives and bringing shame to the family versus engaging in marriage without coital desire. Similarly, married MSM may feel comfortable in many familial and public settings because of acquiescing to societal expectations, but may experience internalized distress because of a

need to maintain a secret life, with attendant fears of inadvertent disclosure resulting in familial disruption (9). These culturally-related tensions may enhance the risk of MSM for syndemics, i.e. synergistic epidemics of adverse health outcomes (27), which are predictive of sexual risk behavior and incident HIV infection among MSM (28). In this case, the furtive sexual experiences may result in depression or anxiety disorders (29), which may be transiently alleviated by the pleasures of unprotected sex with resultant increased risk for HIV or STD, and/or may be abetted by substance use (30). The high prevalence of depression in HIV-infected MSM in this study raises a specific concern, given that first the first line antiretroviral treatment regimen contains efavirenz (4), which can exacerbate neuropsychiatric symptoms.

For married MSM, the secret nature of their behavior may mean that they are less likely to be approached by community outreach workers, and/or they may be more reticent to access services in centers that they perceive as potentially compromising their desire to keep their homosexual behavior unknown to family and colleagues. However, a similar percent of the MSM recruited at cruising sites in another Indian study were married to women, suggesting that a substantial number of sexually active Indian MSM are married to women (31). Married Indian MSM may be vulnerable to violence and exploitation given the frequent need to engage in covert liaisons (32). It is notable in this study that both married and unmarried MSM reported high levels of psychological distress with about a fifth of the sample reporting suicidal ideation. The data in the current study and other recent work (25, 26, 32) underscore the need for effective prevention efforts to offer culturally-tailored mental health screening and evidence-based behavioral health services, as well as the provision of screening tests and risk-specific counseling.

To decrease HIV and STD transmission among Indian MSM, prevention interventions will need to be tailored to diverse subcultural identities. More than 10% of the married MSM and 25% of the unmarried MSM in the current study did not endorse any of the traditional Indian or Western MSM identities. These findings underscore the importance of recognizing that “MSM” is a convenient public health term that can sum up a common mode of HIV transmission, i.e. condomless anal sex. However, individuals engaging in this practice constitute a heterogeneous population, and prevention efforts should not conflate sexual and gender identities with specific behaviors. Prevention efforts directed towards specific subgroups that attempt to understand the dynamics of HIV and STD are more likely to result in the desired goal of attenuating HIV and STD spread (33).

Diagnosing HIV and other STD in Indian married MSM creates several unique challenges, since the detection of infection may often require disclosure to a spouse, so that she can avail herself of treatment, and to prevent transmission to any new offspring (31, 34). Yet, the disclosure of infection will invariably raise questions about the mode of acquisition. The reticence of Indian MSM who are married to women to disclose their HIV and STD diagnoses with their wives makes these women at risk for disease acquisition, and may result in the transmission of infections to offspring. In order to increase the likelihood that married MSM will avail themselves of screening services and prevention programs, further work is needed to understand how to best create a supportive environment that will not only

diagnose and treat infections, but will also provide the supports that will enable married MSM to disclose health information with spouses (35).

There are limitations to acknowledge and consider with this study. The cross-sectional design of this study limits temporal analysis and, as a result, causal interpretations should not be ascribed to the associations. Additionally, some of these data were self-reported and therefore may be subject to bias due to misclassification. This concern is alleviated in part due to the STD and HIV data being derived from biological samples collected during each participant's study visit. Finally, initial participants, or study "seeds", were recruited directly from those seeking and/or familiar with services offered through an MSM-focused sexual health community-based organization. The sample may, in fact, represent a group of MSM who, at the very least, are comfortable in the presence of other MSM, and as such the study may not have reached hidden MSM who may be uncomfortable with seeking sexual health services at an MSM organization, or being exposed to social interactions with other MSM. Despite this, the data presented here were subject to RDS sampling weights for married and non-married MSM and as such more closely represent valid, unbiased inferences.

The findings in the current study suggest that Indian MSM have a diverse set of identities, but married and unmarried MSM share high levels of HIV and STD. This suggests the need for refining prevention efforts for Indian MSM, including culturally-tailored behavioral interventions to increase HIV and STD testing and the evaluation of biomedical interventions like antiretroviral pre-exposure prophylaxis ("PrEP"). Approaches that recognize the psychological stresses of the diverse MSM subpopulations are needed to reduce the sexual spread of these treatable infections.

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SUMMARY

A respondent-driven sample of MSM in Mumbai found high HIV and STD rates, which did not differ by marital status. Respondents reported high levels of psychological distress.

Table One

Demographic and Social Factors of Mumbai MSM (N= 307)

Factor	Married MSM (N=95)	Unmarried MSM (N=212)	P-Value
Age (SD)	30.9 (7.43)	23.7 (5.03)	<0.001
More than Secondary Education	29.4%	31.3%	NS
Mean Monthly Household Income	17,160 INR	23,195 INR	NS
Employed	91.6%	70.6%	<0.001
Hindu	62.1%	64.2%	NS
Muslim	26.3%	27.4%	
Circumcised	21.1%	26.5%	NS
Born in Mumbai	56.8%	49.2%	0.013
Have Children	65.3%	1.4%	<0.001

Table Two

Behavioral and Social Characteristics of Mumbai MSM (N= 307)

Factor	Married MSM (N=95)	Unmarried MSM (N=212)	P-Value
Mean N anal acts (SD) *	10.1 (15.7)	9.5 (14.2)	NS
Mean N unprotected anal acts (SD) *	2.9 (5.0)	4.2 (9.4)	NS
Mean N oral acts (SD) *	8.0 (16.2)	9.3 (30.1)	NS
>30 Sexual Partners *	5.3%	7.6%	NS
Sexual Identity			0.002
Kothi	26.6%	34.1%	
Panhi	7.5%	10.1%	
Double Decker	35.1%	17.8%	
Gay	8.5%	5.8%	
Bisexual	9.6%	7.2%	
Something Else	7.5%	4.8%	
Don't Know	5.3%	20.2%	

* behavior in the last 3 months

Table Three

Psychosocial Factors Among Mumbai MSM (N= 307)

Factor	Married MSM (N=95)	Unmarried MSM (N=212)	P-Value
Depressed	27.4%	20.1%	NS
Suicidal Ideation	22.1%	20.3%	NS
PTSD*	14.7%	10.4%	NS
Low Self-Esteem	23.4%	30.0%	NS
Number of People Known By Name (SD)	163 (150)	193 (161)	NS
2 Friends that can be called upon for help	43.2%	42.9%	NS
Use alcohol 1x/week	10.5%	9.5%	NS
Use cannabis 1x/month	3.29%	4.7%	NS

* PTSD=Post-traumatic stress disorder

Table Four**HIV/STD Prevalence Among Mumbai MSM**

Infection	Married MSM (N=95)		Unmarried MSM (N=212)		P-Value
	Crude	RDS-adjusted	Crude	RDS-adjusted	
HIV	9.5%	14.4%	7.6%	14.3%	NS
Syphilis	4.3%	1.0%	3.9%	8.3%	NS
Gonorrhea	3.2%	8.5%	3.3%	5.3%	NS
Chlamydia	13.8%	14.0%	8.0%	9.2%	NS
Any bacterial STD	17.9%	18.3%	12.7%	20%	NS