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Risk Factors for Syphilis and Prevalence of HIV, Hepatitis B and C among Men Who Have Sex with Men in Beijing, China: Implications for HIV Prevention

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Abstract

To examine the correlates for syphilis and the prevalence for HIV, hepatitis B, hepatitis C among men-who-have-sex-with-men (MSM) in Beijing, China. A total of 541 MSM was recruited using peer-referral, community outreach, and Internet. Questionnaire-based interviews provided information including, demographics, sexual and other risk behaviors. HIV prevalence was 4.8%, syphilis 19.8%, HCV 0.4% and HBsAg 6.5%. The median number of lifetime male sex partners was ten. In the past 3 months, 20.7% drank alcohol ≥ 1 times per week. In the past month, 21.3 and 14.6% had unprotected anal intercourse with regular and casual male sex partners, respectively. Syphilis infection was associated with less education, alcohol use, finding male sex partners through bathhouses/public washrooms/parks, and diagnoses of sexual transmitted diseases (STDs). Syphilis is now epidemic among Beijing's MSM. Prevention efforts are urgent as HIV prevalence is already near 5%. Education, condom promotion, STD control, and alcohol-related intervention are needed urgently.

Keywords

China; Men who have sex with men; Syphilis; HIV; Sexually transmitted disease (STD); Risk behavior

Introduction

Injection drug use (IDU) and unhygienic plasma collecting practices has been the two major transmission routes of HIV/AIDS in China since the first large outbreak of HIV in China was identified in 1989 among IDUs in Yunnan Province in southwest China (CDC 2007b). In recent years, however, the risk of sexual transmission of HIV has grown, either through heterosexual contact with female sex workers (FSWs) or male-to-male sexual transmission (Qian et al. 2005). Among the estimated 700,000 people living with HIV/AIDS in 2007, 40.6% were infected through heterosexual transmission and 11.0% through homosexual transmission (State Council AIDS Working Committee Office and UN Theme Group on HIV/AIDS in China 2007). Men who have sex with men (MSM) have newly emerged as a high-risk group in China. Under social pressure, MSM hide their sexual orientation; nearly one-third of MSM are married in China, and an even higher proportion reported having had sex with women (Choi et al. 2004; Zhang et al. 2000). Therefore, MSM may play a critical bridging role in spreading HIV and other sexually transmitted diseases (STDs) from their high risk male sexual partners to their low risk female partners such as their wives (He et al. 2006). Homosexual transmission has primarily been documented in large and middle-sized cities and areas with large concentrations of migrants (Li et al. 2008). National estimates and local projections indicate that 2–5% of males are MSM (Liu et al. 2006), varying by urban and rural areas and by economic conditions. While data on HIV/AIDS prevalence among FSWs are increasingly available from the national HIV sentinel surveillance system (Lu et al. 2006) and epidemiologic studies (Chen et al. 2005; Ding et al. 2005; Ruan et al. 2006; Wang et al. 2005), little is known about HIV/AIDS and other STDs among Chinese MSM.

In the past two decades, China has also observed a remarkable increase of other STDs besides HIV because of the changing in social values and sexual behaviors, and because of population shifts due to migration (Yang et al. 2005). The first resurgent cases of syphilis were recognized in China in 1979, and the national surveillance data in China has demonstrated a steady and disturbing spread of this disease throughout the country. The annual reported incidence (1/100,000) of syphilis increased from 0.017 in 1985, to 0.23 in 1990, and rapidly rose to 6.43 in 2000 and 13.35 in 2006 (CDC 2007a). Ulcerative STDs, including syphilis, are of particular concern as they have been found to increase the likelihood of HIV seroconversion by 2–5 times (Nasio et al. 1996; Rottingen et al. 2001; Ruan et al. 2007). HIV infection, in turn, may increase the acquisition of other STDs and alter the natural history and response to standard therapy of ulcerative STDs, resulting in “epidemiological synergy” between HIV and STDs (McClelland et al. 2005; Wasserheit 1992). Studies in western countries found that alcohol use or drinking more can increase unprotected sexual behaviors and the risk of acquiring HIV and other STDs (Woolf and Maisto 2008). The role of alcohol consumption, substance abuse, sexual behavior, and acquisition of syphilis infection among MSM is not well understood in the Chinese context. At the time this study began, limited data showed the high prevalence of syphilis among MSM in China (Cai et al. 2005; Choi et al. 2007; He et al. 2006; Jiang et al. 2006). Little was known about correlates for syphilis infection among Beijing's MSM in China. Our study examined the risk factors for syphilis and the prevalence of HIV, hepatitis B, and hepatitis C among MSM in Beijing, China.

Methods

Participants and Recruitment

A community-based cross-sectional study was conducted among MSM in Beijing from November 2006 to February 2007 in China's capital city of Beijing. Study participants were recruited using three methods. First, study participants were recruited through website advertisement by a non-governmental AIDS volunteer group (www.hivolunt.net). Second, peer recruiters were hired and trained to distribute flyers with study-related information at MSM-frequented venues, e.g., MSM clubs, bars, parks and bathhouses. Third, study participants were encouraged to refer their peers to attend the study. All potential participants came to a district HIV testing and counseling clinic in downtown Beijing for eligibility assessment. Eligibility criteria included, 18 years or older, being male, having had sex with another male in the past 3 months, and being willing to finish the study and provide written informed consent. Written informed consent was obtained from all study participants before being interviewed. Those who met the screening criteria then completed an HIV/STD risk assessment interview and received HIV pretest and risk reduction counseling. Blood samples were tested for HIV, syphilis, HCV antibodies, and HBsAg. Participants were also given HIV post-test counseling when they returned for their HIV test results.

A total of 551 participants were interviewed. Ten were not eligible for the study, eight out of these ten reported having had no sex with a male in the past 3 months and one were unable to complete the study due to time constrain, and one was not conformable to answer the sensitivity of the private questions. A total of 541 participants were eligible and completed the study, 225 of them recruited by peer referrals, 127 via Internet, 29 recruited from staff outreach, 27 via grassroots organizations, 90 from newspaper, and 43 from clinic. Ten fee condoms and two bottles of lubricant, plus 50 Yuan (RMB) were offered as the compensation for the transportation and time for their participation. The participants being detected for HIV-infection were provided free clinical examination, CD4 cell counts and viral load measurement, and referred to the National and local on-going HIV prevention, treatment, and care programs. Participants with syphilis infection were offered free treatment. Treatment for Hepatitis B and C infected participants were referred to the local hospitals and HBV vaccination were referred

to local vaccination clinic of local district CDC. All infections are reported to the local district CDC following the requirements of reportable infectious diseases.

Measures

The questionnaire was adapted from our previous study among MSM conducted in Beijing in 2004 and reviewed by nine key informants, four of them MSM. The questionnaire was piloted in three different populations, including 20 persons from the general population, 20 MSM in Beijing, and 20 experienced interviewers from the Beijing MSM cohort study of the China CDC. Data were collected using an interviewer-administered questionnaire on the basis of one-to-one interviews in a separate room of the district clinic. Trained health professionals conducted the interviews. Each study participant was assigned a unique and confidential identification code for the questionnaire and specimens. Data were collected, including sociodemographic information (e.g., age, ethnicity, education, residence, income, marital status and housing status) and behavioral information (e.g., self-identified sexual orientation, the number of male sex partners in the past 3 months, had sex with foreign male sex partners in the past 3 months, participated in male group sex in the past 3 months, had commercial sex with male sex partners in the past 3 months, were money boys (male sex workers), had unprotected anal intercourse with regular or casual male partners in the past month, sex with female sex partners in the past 3 months, smoked cigarettes in the past 3 months, frequency of alcohol intoxication in the past 3 months, illicit drug use in the past 3 months, diagnosed with any STDs by clinic physician in the past, received any AIDS-related services in the past 3 months, and received HIV testing in the past). The frequency of alcohol intoxication was determined directly from responses to two questionnaire items in which respondents were asked (1) whether they drank more or got high from drinking in the past month; (2) how many times per week they drank alcohol in the past 3 months. At the end of the interview, client-centered counseling was provided on HIV, HBV, HCV, syphilis, and other STDs. Blood was then drawn for serological testing. Participants were instructed to return or make a telephone call in 1 month to obtain results. Results were given anonymously; participants needed to provide the unique code we assigned to obtain/get their results.

Blood samples were collected from all participants for HIV, syphilis, HCV, and HBsAg tests. The HIV infection status was determined by an enzyme immunoassay (EIA) (Beijing Wantai Biological Medicine Company, China) screening and a HIV-1/2 Western Blot confirmation (HIV Blot 2.2 WB™, Genelabs Diagnostics). Syphilis infection was determined using an EIA (Beijing Wantai Biological Production Company, Beijing, China) and confirmed a Passive Particle Agglutination Test for Detection of Antibodies to *Treponema pallidum* (TPHA™, OMEGA, UK). HCV infection and HBsAg positivity were determined by the enzyme immunoassay (EIA) (Beijing Wantai Biological Medicine Company, China) testing, respectively.

Data Analysis

Survey data were recorded and compared with EpiData software (EpiData 3.0 for Windows; The EpiData Association Odense, Denmark). After corrections, data were then converted and analyzed using Statistical Analysis System (SAS 9.1 for Windows; SAS Institute Inc., NC, USA). The prevalence rate of syphilis and its 95% confidence interval (CI) was calculated by the exact binomial procedure. Variables significant at a level of 0.1 in bivariate logistic regression analyses were fitted into multivariate models. Multivariate logistic regression models were constructed to select independent risk factors for syphilis infection, while controlling for potential confounding factors. Both adjusted odds ratio (AOR) and CI were obtained for each explanatory variable in the final models.

Results

Of the 541 participants, the median age was 27 years, with a range from 18 to 62 years; 91.3% belonged to Han ethnic group; 72.1% completed college or higher level of education and 18.1% had senior high school education; and 34.3% were Beijing permanent residents; the median monthly income of the participants was \$300 US dollars; 66.9% were single, 13.9% were cohabiting with male sex partners and 14.4% were married or cohabiting with female sex partners. Participants identified as exclusively homosexual and predominantly homosexual accounted for 53.6 and 39.2%, respectively, whereas 7.2% were identified as predominantly heterosexual with only incidental homosexual activities.

The median number of male partners in a lifetime was ten. 47.5% received HIV tests in the past and 13.7% received any AIDS-related services in the past 3 months. About 31.2% had an STD diagnosed by clinic physicians in the past. In the past 3 months, 72.6% of participants found male sex partners through the Internet; 4.1% had sex with foreign male sex partners; 8.0% participated in male group sex; 6.8% had commercial sex with men and 4.1% were money boys; 13.9% had sex with female sex partners, with a mean of the number of female sex partners at 4.3 ($SD \pm 36.1$); 28.6% smoked cigarettes ≥ 7 per week and only 0.7% used illicit drugs (mainly ecstasy and ketamine). Of participants, 20.7% drank alcohol ≥ 1 times per week; the 3-month drinking rate was 42.1%, with 25.0% of them had alcohol beverages twice or more per week. In the past month, 21.3 and 14.6% of the participants had unprotected anal intercourse with regular male sex partners and casual male sex partners, respectively; 7.0% had unprotected sex with female sex partners.

Among the 541 eligible participants, HIV prevalence was 4.8%, syphilis prevalence was 19.8%, HCV prevalence was 0.4%, and HBsAg prevalence was 6.5%.

In bivariate analyses, factors significantly associated with syphilis infection were older age, less education, having sought male sex partners through bathhouses/public washrooms/parks, drinking alcohol, and having had an STD diagnosed by clinic physician in the past. Five factors significant in univariate analyses were fitted into a multiple logistic regression model. Age was not entered into the final model. Less education (AOR, 1.7; 95% CI, 1.0–2.7; ≤ 12 years of age), having sought male sex partners through bathhouses/public washrooms/parks (AOR, 1.6; 95% CI, 1.0–2.7), drinking alcohol ≥ 1 times per week (AOR, 1.9; 95% CI, 1.1–3.2) and having had an STD diagnosed by clinic physician in the past (AOR, 3.5; 95% CI, 2.2–5.6) were independently associated with syphilis infection (Tables 1, 2).

Discussion

Our study found low levels of HCV (0.4%), a moderate prevalence of HIV (4.8%) and HBsAg (6.5%), but a high prevalence of syphilis (19.8%) among MSM in Beijing, China. Comparing with the 2005 prevalence rates (3.2% for HIV and 11.2% for syphilis) in our previous study conducted in the same district (Ruan et al. 2007), we found a slight increase in HIV prevalence and a dramatic rise in syphilis prevalence ($P < 0.001$) among this group in Beijing.

Consistent high prevalence rates of syphilis were reported among MSM populations in different studies in Chinese cities; for example, 6.9% in five cities of Jiangsu Province, 13.5% in Shanghai, 10.5% in Guangzhou, and 19.1% in Shenzhen City (Cai et al. 2005; Choi et al. 2007; He et al. 2006; Jiang et al. 2006). However, the HIV epidemic among MSM has a wide geographic variation and is concentrated in several urban cities in China. The HIV prevalence was reported at 10.4% in Chongqing (southwestern China) (Yang et al. 2007), representing an ominous rise, but much lower rates were reported in other cities. In recent studies, no case was found in five cities of Jiangsu (Jiang et al. 2006), Dalian, Liaoning (Wang et al. 2004), and Guangzhou (He et al. 2006). Lower rates were reported in Shanghai (1.5%) (Choi et al.

2007), Jinan (0.5%) (Ruan et al. 2008), Harbin (2.2%) (Zhang et al. 2007), and Shenzhen City (1.6%) (Cai et al. 2005). MSM have not yet contributed to a large part of the HIV cases so far (CDC 2007b; State Council AIDS Working Committee Office and UN Theme Group on HIV/AIDS in China 2007). However, in many western countries, e.g., Netherlands, United States, Germany, United Kingdom and France, MSM are the most heavily infected subgroup and contribute a large portion of HIV cases (United Nations Program on HIV/AIDS 2006). Many of these countries in the West may be experiencing a resurgence of HIV transmission among MSM, as evidenced by increases in syphilis, unprotected anal sex, and HIV incidence itself (Fenton and Lowndes 2004; Peterman et al. 2005). The astonishing rise in HIV prevalence rates among MSM in Phnom Penh, Cambodia (8.9%), Bangkok, Thailand (28.3%); and Andhra Pradesh, India (18.2%) (“HIV prevalence among populations of men” 2006; United Nations Program on HIV/AIDS 2006), especially in Chongqing, China (10.4%), remind us that HIV has been introduced into Chinese MSM and this group may be facing a rapid spread of HIV. China recognizes the HIV/AIDS needs of more easily identifiable risk groups (e.g., injection drug users, female sex workers, and former blood/plasma donors), but neglects the needs of their estimated 10–20 million MSM (State Council AIDS Working Committee Office and UN Theme Group on HIV/AIDS in China 2007). Low availability of AIDS-related intervention programs (13.7%) and HIV testing (47.5%) was shown in the present study, and similar results were observed in other studies (Xiao et al. 2008). Without timely action, MSM could become the second most at-risk group for HIV infection in China following injection drug users.

Our study found predictors of high risk of syphilis infection included low levels of education, having found male sex partners through bathhouses/public washrooms/parks, drinking alcohol ≥ 1 times per week and having had an STD diagnosed by a clinic physician in the past. No association was found between drinking alcohol and HIV infection in this study, but both syphilis infection and more male sex partners were found independently associated with HIV infection (data not shown). MSM with less education lack knowledge of risk behaviors and engage in unprotected sex practices. Our early study also reported that places where men seek male sex partners were associated with the risk of syphilis infection (Ruan et al. 2007). However, MSM who found male sex partners via bathhouses, public washrooms and parks were more likely to engage in high risk behaviors, and were also associated with not carrying condoms in public places (Hart and Peterson 2004). This finding suggests that prevention and intervention should be targeted to those places through outreach, such as through providing education materials, behavioral interventions, and condom promotion. One-third of MSM reported having an STD diagnosed by clinic physicians in this study, which suggested urgency for providing STD screening, treatment, and care for MSM in China to reduce the potential risk of HIV infection.

Our finding of 13.9% of participants had female partners during past 3 months and one-fifth married or cohabiting with female sex partners are slightly lower than the MSM in other reports in Beijing and Shenyang (Choi et al. 2004). These suggested a high level of potential bridging from MSM to the general population through regular and casual female partners, a so-called “bisexual bridge”. A substantial number of MSM might be using marriage as a means to disguise their MSM behaviors or sexual orientation. China is still a relatively conservative country, and Chinese culture does not render homosexuality as a subject open for discussion (Liu and Choi 2006). Stigmatization against MSM in Chinese societies may be still quite serious. Relevant advocacy efforts in China are at most preliminary.

Only 0.7% of participants in our study used illicit drugs in the past 3 months; this is similar to the finding (0.5%) in another study in Beijing (He et al. 2005). This indicates that there was little overlap in two populations—drug users and MSM in Beijing. Conversely, drug abuse is common among MSM in Western countries and often constitutes a major risk for HIV infection in this population (Folch et al. 2006; Koblin et al. 2006). Drug use may relax safer sex norms

and increase unprotected anal sex and the risk of acquiring HIV (Folch et al. 2006; Koblin et al. 2006). Drug use rates were low among MSM in Beijing, but our study found a high prevalence of smoking and alcohol use among this group.

Excessive drinking and alcohol-related problems are serious issues for public health world-wide. For the economic and culture reasons in China, the total amount of alcohol production and consumption and the prevalence of alcohol related physical and mental diseases was relatively low before the end of the 1970s. With the rapid development of the economy, urbanization and westernization, alcohol production and consumption and numbers of admitted patients with alcohol-related physical and mental diseases have increased steadily (Cochrane et al. 2003; Hao et al. 2005, 1995). Dr. Hao's study in five Chinese provinces found that 3-month drinking rate (the proportion of participants drunk in the last 3-months) was 63.8% among the male general population and 66.2% of these 3-month drinkers had alcohol beverages twice or more per week (Wang et al. 2004). Our study found that the 3-month drinking rate among MSM participants was 42.1% (228/541), with 25.0% (57/228) of them had alcohol beverages twice or more per week, both rates are lower than the rates in the general male population in Dr. Hao's study. Comparing the low prevalence of drug use among MSM in Beijing, the alcohol use may be more relevant for Chinese MSM than Western samples of MSM.

Frequent alcohol use was found to be independently associated with syphilis infection among Chinese MSM after controlling for other potential confounding factors. Studies have indicated that individuals who drink more heavily are more likely to have multiple sexual partners and are less likely to use condoms consistently (Graves 1995; Leigh and Stall 1993; McEwan et al. 1992). A study among American adults using a national sample found that heavier drinking patterns were associated with being sexually active and having more than one sexual partner, even when age, gender, and marital/relationship status were taken into account (Leigh et al. 1994). In a separate study of African-American men (Morrison et al. 1998), it appeared that frequency of alcohol use was significantly associated with unprotected sex and multiple sexual partners in the past month. Other studies have validated this finding (Castilla et al. 1999). A correlation has also been reported between the quantity of alcohol consumption and the incidence of unprotected sexual intercourse (Lauchli et al. 1996). The behavioral effects of alcohol are multifactorial, including social disinhibition or interference with judgment and decision making, which may lead to a higher risk of STD exposure (Halpern-Felsher et al. 1996). Both alcohol use and risky sexual behaviors may represent manifestations of underlying risk-taking and/or sensation-seeking tendencies (Leigh et al. 1994). Regrettably, these tendencies when applied to sexual behaviors have been shown to increase the risk of contracting STDs (Laumann et al. 1994). Our study is consistent with these findings and suggested that the intervention efforts targeted at MSM also need to directly address use of alcohol in China.

Although the results of our study suggest a possible association between frequent alcohol consumption and syphilis infection, both alcohol use and sexual activity are intrinsic behaviors among MSM and their complex association requires further study before firm conclusions can be drawn. The role of alcohol consumption and substance abuse in sexual behavior and acquisition of HIV and other STDs among MSM is not well understood in the Chinese context. Much needs to be done to clarify the determinants of the use and misuse of alcohol, as well as drug use, whether alcohol consumption relates to sexual behavior, and the factors that account for the relationship between the two behaviors. STD risk reduction strategies, education, and behavior intervention have traditionally been ignored among MSM. An understanding of these relationships may allow efforts and resources to be directed toward individuals whose behavior places them at risks. No association between alcohol drinking and HIV infection found in this study calls for further research.

We recognize that the limitation of our study is the representativeness of our sample. Despite using multiple recruitment methods that approximated random sampling, mainly recruited via Internet. The questionnaire data relying on retrospective self-reports was subject to recall bias. The exposures themselves (e.g., frequency of alcohol intoxication and drug use) may impact directly on recall ability. The sensitive nature of the questions (related to sex, drug use, and alcohol intoxication) may lead to information bias due to the social desirability of certain answers. Responses relating to both the exposures (frequency of alcohol intoxication and drug use) and outcomes (risky sexual behaviors) are difficult to validate externally. Another limitation of this study is the cross-sectional research design, which precludes identification of causal relationships. This makes it difficult to discern directly how potential risk factors, e.g., alcohol use, may influence or be otherwise related to syphilis infection. Despite these limitations and possible biases, we feel our data highlight a prevention opportunity that cannot be ignored.

Our study showed that the syphilis is now epidemic among MSM in Beijing. Prevention efforts are urgent as HIV prevalence is already near 5%. HIV sexual risk-reduction interventions for Chinese MSM need to address the overlapping epidemics of alcohol, drug use, and STDs. An incorporated HIV risk reduction strategy, including education, condom promotion, STD control, and alcohol and drug use-related intervention, is needed urgently.

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Social-demographic correlates associated with syphilis infection among men who have sex with men in Beijing, China

Table 1

Variables	N	Syphilis infection		
		%	OR (95% CI)	P
Age (median, years)	270	15.6	1.0	
	≥27	24.0	1.7 (1.1, 2.6)	<0.05
Ethnicity	494	20.6	1.0	
	Han	10.6	0.4 (0.2, 1.2)	ns
	Minority	16.7	1.0	
Years of education	390	27.8	1.9 (1.2, 3.0)	<0.01
	>12	21.4	1.0	
	≤12	16.8	0.7 (0.5, 1.2)	ns
Beijing permanent residents	356	19.9	1.0	
	No	19.6	1.0 (0.6, 1.5)	ns
	Yes	19.4	1.0	
Months income, P3M (median, US dollar)	270	21.8	1.2 (0.6, 2.1)	ns
	≤300	20.0	1.0	
	>300	19.1	0.9 (0.6, 1.5)	ns
Married/Cohabited with female sex partners	463	19.1	1.7 (1.0, 2.7)	<0.05
	No			
	Yes			
Living in own house or with parents	405			
	No			
	Yes			

OR odds ratio, CI confidence interval, AOR adjusted odds ratio, P3M in the past 3 months

Table 2
Behavioral correlates associated with syphilis infection among men who have sex with men in Beijing, China

Variables	N	Syphilis positive		P	AOR (95% CI)	P
		%	OR (95% CI)			
Sexual orientation of exclusively homosexual	251	20.3	1.0			
Yes	290	19.3	0.9 (0.6, 1.4)	ns		
Total number of male sex partners (median)	292	16.8	1.0			
≤10	249	23.3	1.5 (1.0, 2.3)	ns		
>10	148	21.0	1.0			
Found male sex partners through Internet, P3M	393	19.3	0.9 (0.6, 1.4)	ns		
Yes	418	16.8	1.0		1.0	
Found male sex partners through bathhouse/public washroom/park, P3M	123	30.1	2.1 (1.3, 3.4)	<0.01	1.6 (1.0, 2.7)	<0.05
Yes	333	17.7	1.0			
Total number of male sex partners, P3M (median)	208	23.1	1.4 (0.9, 2.1)	ns		
≤2	498	18.9	1.0			
>2	43	30.2	1.9 (0.9, 3.7)	ns		
Participated in male group sex, P3M	504	19.8	1.0			
No	37	18.9	0.9 (0.4, 2.2)	ns		
Yes	519	20.4	1.0			
Had commercial sex with men, P3M	22	4.6	0.2 (0.0, 1.4)	ns		
Yes	426	20.4	1.0			
No	115	17.4	0.8 (0.5, 1.4)	ns		
Had unprotected anal intercourse with regular male sex partners, P1M	462	19.0	1.0			
Yes	79	24.0	1.3 (0.8, 2.4)	ns		
No	466	20.6	1.0			
Had unprotected anal with casual male sex partners, P1M	75	14.7	0.7 (0.3, 1.3)	ns		
Yes	386	21.8	1.0			
No	155	14.8	0.6 (0.4, 1.0)	ns		
Had sex with female sex partners, P3M	429	17.7	1.0		1.0	
Yes	112	27.7	1.8 (1.1, 2.9)	<0.05	1.9 (1.1, 3.2)	<0.05
No	462	19.5	1.0			
Smoked, P3M (cigarettes/week)	79	21.5	1.1 (0.6, 2.0)	ns		
≥7						
<7						
Drank alcohol, P3M (times/week)						
≥1						
<1						
Drank more or got high, P1M						
Yes						

Variables	N	Syphilis positive		OR (95% CI)	P	AOR (95% CI)	P
		%					
Attended AIDS program, P3M	No	467	19.3	1.0			
	Yes	74	23.0	1.2 (0.7, 2.2)	ns		
Diagnosed a STD by clinic physician in the past	No	372	13.2	1.0		1.0	
	Yes	169	34.3	3.4 (2.2, 5.3)	<0.01	3.5 (2.2, 5.6)	<0.01
Received a HIV test in the past	No	284	18.3	1.0			
	Yes	257	21.4	1.2 (0.8, 1.8)	ns		

OR odds ratio, CI confidence interval, AOR adjusted odds ratio, P3M in the past 3 months, P1M in past month