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HIV prevalence and risk behaviors among male clients of female sex workers in Yunnan, China

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Abstract

Objectives—To assess the prevalence and risk factors of HIV among male clients of female sex workers in China.

Methods—Convenience sampling methods were used to recruit 315 clients using FSW-client and client-client networks. Subjects provided information on socio-demographic characteristics and sexual and drug behavior patterns. Blood samples were collected for HIV testing and urine samples for opiate testing.

Results—Overall HIV prevalence was 6.0%; among drug users it was 30.8%. 33.7% of respondents reported that they always use condoms in commercial sex and 63.5% that they used a condom in the last commercial sex episode. Drug use (OR: 6.1; 95% CI: 1.7–21.4) and lack of a regular sexual partner (OR: 6.3; 95% CI: 1.8–21.9) were significantly associated with HIV infection.

Conclusions—Clients of FSWs serve as potential bridges for HIV transmission from the high-risk FSWs to the low-risk general population, making them a key target for intervention. High HIV prevalence rates among clients in Kaiyuan is particularly alarming given their risk behavior patterns including high rates of partner exchange, low condom use rates, and drug using behaviors. Innovative interventions are needed to reduce the risk of HIV among clients and reduce the bridge of transmission to the general population.

Keywords

HIV; clients of female sex workers; commercial sex; condom use; China

Introduction

The Joint Assessment on AIDS in China reported that, in 2007, sexual transmission replaced injection drug use as the dominant mode of HIV transmission in China. From 2005 to 2007 among the cumulative number of people living with HIV/AIDS, the proportion of total infections estimated to have taken place through heterosexual contact increased from 10.7% to 37.9%, whereas the proportion of IDU transmissions fell from 44.3% to 29.4%.[1,2] and a significant proportion of infections in 2007 are estimated to be between sex workers and their clients.[1] The HIV epidemic in China is further complicated by growing evidence of mixing between the injection drug user (IDU) and sexual transmission cohorts.[3–5] The interaction between these at-risk groups is thought to play a role in “seeding” generalized heterosexual epidemics[6,7].

Yunnan Province is one of the epicenters of the HIV epidemic in China.[8] HIV in Yunnan has primarily spread through injection drug use which is prevalent in the region due to its proximity to Southeast Asia’s Golden Triangle region of high opium production.[9,10] Economic development has also led to a flourishing commercial sex industry. A number of studies have been conducted among female sex workers (FSWs) in China but little is known about their male clients due to the difficulty of identifying and recruiting them into studies. [11] What little is known about the sexual risk behaviors of Chinese clients—multiple sexual partners, low or inconsistent condom use[12]—suggests that they may play a considerable role in the epidemic as a potential “bridge” of HIV transmission to the general population. This study seeks to understand the likelihood cited by past studies for clients to spread the HIV epidemic to the general population in China[12], including their condom use rates, frequency of partner exchange, patterns of sexual mixing with different types of sexual partners (paid, non-paid, regular, causal, etc.), and drug use behaviors and was conducted in Kaiyuan City, Yunnan Province, where previous studies have reported HIV prevalence of 10% in FSWs and high rates of other STDs.[13–15]

Methods

This cross-sectional study was conducted from April through May 2008. Study subjects were recruited using convenience sampling methods in which outreach workers, local health officials, and FSW peer educators approached clients at commercial sex venues. In addition, snowball sampling methods were used by way of “FSW-client” and “client-client” referrals, in which existing study participants were asked to recruit future participants from among their acquaintances. Because of the informal nature of many referrals, it was difficult to assess the participation rate for subjects. Interviews and blood and urine sample collection were carried out at the local HIV outreach office, located in close proximity to many of Kaiyuan’s sex work venues. After providing written informed consent, subjects answered questions on socio-demographic characteristics and sexual and drug use behaviors in face-to-face interviews with trained staff using a structured questionnaire. Blood samples were transported to laboratories within 12 hours and screened for HIV antibodies by enzyme-linked immunosorbent assay (ELISA; Beijing BGI-GBI Biotech Co., Ltd., China) and positive tests were confirmed at the Yunnan Provincial Center for Disease Control and Prevention (Yunnan CDC) using Western blot (WB; MP Diagnostics, Singapore). Urine samples were tested on site for opiates using morphine gold conjugate test strip (ACON, Beijing).

The study received approval from the institutional review board of the National Center for AIDS/STD Control & Prevention, China CDC. All returning participants were provided with HIV post-test counseling and HIV positive subjects were referred to the Kaiyuan CDC for free counseling and evaluation for treatment.

Statistical analysis was performed using SPSS 15.0 (SPSS Inc., Illinois, USA). All descriptive data were of non-normal distribution and were described using median and interquartile range (IQR). Independent risk factors of HIV infection were assessed using logistic regression analysis, with variables significant in the univariate analysis and those felt to be clinically relevant entered into a multivariate model. All testing was two-sided with significance determined at $P \leq 0.05$.

Results

Demographic characteristics

Among 315 male clients who agreed to participate, median age was 36 years (IQR, 23–45 years), 72.1% (227/315) of male clients were Han ethnicity, 86.7% (273/315) had less than 9 years of schooling, 40.6% (128/315) were married or cohabiting with a female companion, and median monthly income was 700 Chinese yuan (IQR, 500–1000 yuan; 65–140 US dollars). Sixty percent (189/315) were registered residents of Kaiyuan City, 24.8% (78/315) were from other parts of Yunnan Province, and 15.2% (48/315) were from outside Yunnan Province.

Sexual Behaviors and Drug Use

The median age of sexual debut among the client participants was 19 years (IQR, 17–22 years), and the age of first purchase of commercial sex was 26 years (IQR, 19–36 years). 59.7% reported having a regular sexual partner (e.g. wife or girlfriend) at the time of interview, with whom 60.5% reported that they never used condoms. 37.5% of all clients reported casual sex (sex with an unpaid partner who is not their girlfriend or wife) with a median of two casual sexual partners (IQR, 1–4), and with whom 43.2% reported having never used condoms.

Regarding commercial sexual behaviors, 39.0% of clients reported purchasing sex from FSWs more than once a month. 67.3% preferred buying sex when out with friends, and 26% liked to visit the same FSW each time. 33.7% of respondents reported that they always used condoms with FSWs and 63.5% that they used a condom in their last commercial sexual episode. Using the definitions of “lower-risk” and “higher-risk” entertainment venues defined in Wang et al.,¹ we found that 27.3% of clients patronized FSW who work in low-risk venues such as karaoke halls, while 72.7% visited FSW of high-risk venues such as hair salons, public areas like streets or plazas.[13] 54.9% of clients reported alcohol consumption before visiting FSW and 24.8% took part in other types of sexual acts including oral and anal sex, with 2.2% having taken part in group sex at least once before. Average amounts paid for sex was 80 RMB (about 11 USD) per visit. Over half (52.7%) reported that they habitually examined FSW for sexually transmitted infection (STI) symptoms before sex.

Twenty-six respondents were categorized as having ever used illicit drugs, with 21 self-reporting and five identified only by positive urinalysis for opiates. Among the 21 subjects 12 reported that they had ever injected drugs and among those 12, five reported that they had ever shared needles with injection partners.

HIV Prevalence and Associated Risk Factors

Of our total client sample 19 (6.0%) were identified as HIV positive, with drug users (8/26, 30.8%) having a much higher HIV prevalence than non-users (11/289, 3.8%). The proportion of HIV-infected drug users who self-reported injecting (5/12, 42%) was similar to those who

¹As defined in Wang et al. “Higher sexworker risk venues were defined as locations where FSWs generally charged less than 100 Yuan (about \$13 USD) for sex services, including beauty salons, temporary sublets, and street walkers; these FSWs attracted the less wealthy and less educated clients potentially at higher risk of HIV infection, such as drug users. Lower sex risk venues were those where FSW generally charged 100 Yuan or more for sex, including karaoke clubs, night clubs, saunas and hotels.”

did not self-report injecting (3/9, 33%, $P=0.52$). Among the six factors entered into the multivariate analysis, only drug use (self-reported or testing urine opiate positive; adjusted odds ratios [AOR] 6.1, 95% confidence interval [CI] 1.7–21.4) and not having a wife/girlfriend (vs. having a wife/girlfriend; AOR 6.3, 95% CI 1.8–21.9) were associated with HIV seropositivity. Of note, clients aged 26–40 years (vs. ≥ 41 years) were at significantly increased risk in the univariate analysis but only of borderline significance in the multivariate analysis (AOR 2.7, 95% CI 0.9–18.7). Self-reported condom use rates were not associated with HIV infection (Table 1).

Discussion

The primary results of this study confirm that male clients in Yunnan, China are particularly vulnerable for HIV infection given their drug use behaviors and sexual relations with multiple types of sexual partners. The HIV positive rates of clients in this study are comparable to provincial averages described in provincial surveillance reports by the Yunnan Province Center for Disease Control (CDC), which averaged at 4% in 2005 (Yunnan CDC Comprehensive Report, 2005). Among the 315 male clients surveyed for this study, 60% were local residents and among the 59.7% with a regular sexual partner (wife or girlfriend), 62.8% reported a median of two additional casual sexual partners per month. Overall HIV prevalence was 6.0%; among drug using clients prevalence was 30.8%. 33.7% of respondents reported that they always use condoms in commercial sex and 63.5% that they used a condom in last commercial sexual episode. This study indicated drug use (AOR: 6.1; 95% CI: 1.7–21.4) and lack of a regular sexual partner (AOR: 6.3; 95% CI: 1.8–21.9) as primary risk factors significantly associated with HIV infection.

One possible explanation why clients without regular sexual partners may be at higher risk for HIV infection is that these clients are likely to visit FSWs more frequently or have higher rates of partner change, thus increasing their likelihood of having sex with an infected partner. To test this we compared frequency of commercial sex between clients with and without regular partners and found that 51.2% of clients without regular partners visited FSWs more than 4 times per month whereas only 30.9% ($p<0.001$) of clients with regular partners visited FSWs more than 4 times per month. Why this study did not find condom use rates to be associated with HIV serostatus may largely be due to a downward bias in self-reported condom use rates. Other studies have also found a weak association between self-reported condom use rates and HIV infection.[14–16] Another possibility is that undetected drug using behaviors may be masking the actual risks associated with sexual transmission of HIV, discussed in further detail below.

The HIV risk associated with drug use is well documented and our study corroborates this with a 6.1 fold increased risk seen among clients identified to be drug users through self-report or positive urine drug tests. The HIV risk associated with drug use is thought to be primarily due to injecting drugs but our study did not find a difference in the proportion of HIV-infected drug users who self-identified as injectors as opposed to those who did not (42% vs. 33%, $P=0.52$). This lack of statistical significance is likely due in part to the small numbers of self-reported injectors, as well as due to the misclassification of injectors who did not self-report.

This study faces several limitations. First is that the study sample may not be representative of the overall male client population in Kaiyuan. Due to study subject recruitment methods, this sample may over-represent clients who purchase sex at lower-risk venues such as karaoke halls where clients maintain longer term, personal relations with FSW, making these men more accessible via “FSW-client” referral methods. Clients who patronize FSW in lower-risk venues are also relatively easier for outreach workers to access because their commercial sexual activity is location specific, whereas clients who visit higher risk FSWs are more difficult to

identify because sexual transactions are negotiated in non-fixed settings with sex often occurring in private residences.[15] Past studies have shown that FSW at higher-risk venues are significantly more likely to be HSV-2 positive, suggesting that their clients may also at higher risk for sexually transmitted infections including HIV[14]. These factors suggest a systematic bias in our study sample that may under-represent the behaviors of clients who visit higher-risk venues, resulting in an underestimation of the risk associated with the types of venues clients visit. Our sample also suffers from self-selection bias and self-reporting bias; however, we cannot determine the direction of these biases without better information about systematic differences between our sample and the larger client population in Kaiyuan. Lastly, because of the convenience sampling methods used and the other biases mentioned above, this sample may not be entirely representative of the larger client population of China.

In addition because urinalysis screening can only identify opiate use within the last four to five days, this study may underestimate the number of drug using clients. In fact, five of the subjects in this study who denied past illicit drug use were identified as drug users due to positive urinalysis results, confirming the underreporting and possibly underestimating the actual risk for HIV infection associated with drug use.

Further research on the sexual and other HIV related risk behaviors of male clients is important for several reasons. In China men often exercise greater decision-making power regarding condom use during sex, which has strong implications for client-side condom interventions. Past studies have also found that FSW in China are a highly mobile group which presents challenges to conducting interventions with this group,[3,14] whereas this study found that clients tend to purchase sex locally (60% of clients were Kaiyuan residents vs. 28% among FSW who work in Kaiyuan [3]), suggesting that clients are less mobile than FSW and thus more accessible for targeted intervention programs.

As a group at high risk of contracting HIV/STDs, male clients are thought to be both an important core transmitter group[17] or so-called `bridge population,[18] forming critical transmission networks between high-risk groups such as FSW and IDU to the general population. The key findings of our study, that a majority of clients were local, had multiple sexual partners, and that the major risk factors for HIV infection were drug use and not having a regular sexual partner (wife/girlfriend), point to the tremendous need for public health interventions among this group. Past studies have also found that FSW in China are a highly mobile group which presents challenges to conducting interventions with this group,[2,13] whereas this study found that clients tend to purchase sex locally (60% of clients were Kaiyuan residents vs. 28% among FSW who work in Kaiyuan [2]), suggesting that clients are less mobile than FSW and thus more accessible for targeted intervention programs. The high numbers of sexual partners, even among those with a wife or girlfriend, and low rates of self-reported condom use provide areas to focus prevention efforts. This study also shows that some male clients in China engage in injection drug use which, when coupled with multiple sexual partners and low condom use, has profound implications for the transmission of HIV to the general population.

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Table 1
Demographics and risk behaviors and their associations with HIV infection for the 315 male clients included in the study.

Variable	Total N=315	HIV positive (%) N=19	Univariate OR (95% CI)	Multivariate OR* (95% CI)	P-value
Demographic					
Age (years)					
16–25	89	1.1	0.3(0.03–2.3)	0.6(0.03–2.7)	0.63
26–40	105	12.4	3.3(1.1–9.5)	2.7(0.9–18.7)	0.11
≥41	121	4.1	1	1	
Ethnicity					
Han	227	7.9	7.5(1.0–57.0)	6.8(0.8–59.5)	0.09
Others	88	1.1	1	1	
Education					
≤6 years	106	5.7	1.2(0.2–6.2)		
7–9 years	167	6.6	1.4(0.3–6.6)		
≥10 years	42	4.8	1		
Marital status					
Married or cohabiting	128	3.9	0.5(0.2–1.4)		
Single, divorced, separated or widowed	187	7.5	1		
Residency					
Kaiyuan resident	189	3.5	1	1	
Others	126	12.6	4.0(1.5–10.3)	1.8(0.6–5.9)	0.28
Monthly income (RMB)					
<500	48	10.4	2.9(0.7–11.4)		
500–1499	163	6.1	1.6(0.5–5.4)		
>1500	104	3.5	1		
Sexual and drug use behaviors					
Age of sexual debut					
12–17	90	4.4	0.9(0.2–3.6)		
18–20	120	8.3	1.9(0.6–5.8)		
≥21	105	4.8	1		
Age first purchased commercial sex					
16–19	94	2.1	1	1	

Variable	Total N=315	HIV positive (%) N=19	Univariate OR (95% CI)	Multivariate OR* (95% CI)	P-value
20-28	95	9.5	4.8(1.0-22.9)	3.1(0.5-17.8)	0.62
≥28	126	6.3	3.1(0.6-15.0)	1.0(0.3-3.4)	0.60
Has regular, non-commercial sex partner (wife or girlfriend)					
Yes	188	2.1	1	1	
No	127	11.8	6.2(2.0-19.0)	6.3(1.8-21.9)	0.01
Has other non-paid sex partner in addition to wife/girlfriend					
Yes	118	7.6	1.5(0.6-3.9)		
No	197	5.1	1		
Frequency of commercial sex					
≤4 time per month	274	5.5	1		
>4 times per month	41	9.8	1.9(0.6-5.9)		
Visit same FSW each time?					
Yes	82	2.4	0.3(0.1-1.4)		
No	233	7.3	1		
Type of FSW patronized by venue					
Lower risk (karaoke)	83	7.2	2.9(0.6-14.7)		
Higher risk (hair salons, public spaces)	232	2.6	1		
Self-reports always uses condom with FSWs					
Yes	106	4.7	0.7(0.2-2.0)		
No	209	6.7	1		
Alcohol use before visiting FSWs					
Yes	173	6.9	1.4(0.6-3.8)		
No	142	4.9	1		
Examine FSW for STI symptoms					
Yes	166	5.4	0.8(0.3-2.0)		
No	148	6.8	1		
Average amount paid per time for purchasing sex					
≤50	151	6.6	0.9(0.2-3.4)		
51-100	123	4.9	0.7(0.2-2.7)		
>100	41	7.3	1		
Ever used illicit drugs					

Variable	Total N=315	HIV positive (%) N=19	Univariate OR (95% CI)	Multivariate OR* (95% CI)	P-value
Yes	26	30.8	11.2(4.0-31.4)	6.1(1.7-21.4)	0.01
No	289	3.8	1	1	

* **Note:** Variables entered into multivariate model include: age, ethnicity, residency, regular sex partner, age first purchased commercial sex, illicit drug use.