Brief Report

Prevalence of HIV infection and HIV-related sex risk behaviors in men who have sex with men in Shandong Province, China

Xiaorun Tao[1,2], Ruoyan Gai[3], Xiaofei Zhang[1], Na Zhang[1], Wei Zheng[1], Aiqiang Xu[1], Shixue Li[2,*]

[1] *Shandong Province Center for Disease Control and Prevention, Ji'nan, China;*
[2] *School of Public Health, Shandong University, Ji'nan, China;*
[3] *Graduate School of Medicine, the University of Tokyo, Tokyo, Japan.*

Summary **Recently, men who have sex with men (MSM) have become a population at high risk of HIV infection in China, and more investigations of and intervention programs targeting this hidden population are urgently needed. The objective of this study was to assess the prevalence of HIV-positive individuals, HIV-related knowledge, and sex risk behaviors in MSM in large and middle-sized cities. Subjects were 1,617 interviewees who were selected by snowball sampling in 8 cities of Shandong Province and who were interviewed using a structured questionnaire. Their serological specimens were tested in a laboratory to confirm infection with HIV. Results indicated a prevalence of HIV infection of 1.3%, which is low when compared to that in metropolitan areas worldwide, although the prevalence of unsafe sexual behaviors was relevantly high and there was a lack of accessibility to HIV/STD testing and peer education. This study revealed the urgent need to make intervention programs universal, effective, and much more accessible to MSM in typical large and middle-sized cities in China.**

Keywords: MSM, HIV infection, Risk sexual behaviors, Intervention, China

1. Introduction

Since the early 1980s, men who have sex with men (MSM) have fallen victim to an epidemic of human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) worldwide. In China, urbanization accelerated by economic changes since the 1980s has complicated the task of HIV/AIDS prevention. HIV/AIDS cases have been increasing over the last several years. At the end of October 2007, the Chinese Ministry of Health, the Joint United Nations Program on HIV/AIDS (UNAIDS), and the World Health Organization (WHO) jointly estimated that China had 700,000 HIV-positive individuals and a prevalence of the infection of 0.05% in the total population (*1*). Sexual transmission is now the predominant route of transmission. MSM were one of main contributors to the 50,000 cases of emerging infection in 2007, suggesting that they are a high-risk population. According to the joint assessment, last year HIV-positive individuals among MSM were estimated to have increased by about 30,000 since their level in 2005. The UNAIDS report (2006) indicated growing evidence of HIV outbreaks among Chinese MSM (*2*).

Unlike in Western countries, MSM remain a "hidden" population in China due to political, socio-cultural, and customary restrictions, and HIV/AIDS prevention and intervention programs targeting MSM in the country have been lacking (*3*). Academic approaches to such a population that is vulnerable to HIV/AIDS have been limited. Several previous studies focused on MSM and related populations in metropolitan areas such as Shanghai, Nanjing, Guangzhou, and Beijing (*4-11*) as well as in Kunming, in which the prevalence of HIV is one of China's highest (*12*). Homosexual transmission was predominant in large and middle-sized cities and areas with large concentrations of migrants. In addition to those metropolitan areas, other major urban areas and other areas experiencing diverse socioeconomic development and urbanization must therefore also be investigated. The objective of this study was to assess the prevalence of HIV-positive individuals, HIV-

**Correspondence to:* Dr. Shixue Li, School of Public Health, Shandong University, Wen-hua-xi Road No. 44, Ji'nan 250012, Shandong, China;
e-mail: shixueli@sdu.edu.cn

related knowledge, and sex risk behaviors in MSM in Shandong Province, which has China's second highest growth rate and second largest population, as well as geographically diversified socioeconomic conditions in different cities and areas that parallel conditions in the country as a whole. Results should provide evidence of HIV/AIDS prevention and intervention programs for policymakers at both the national and the local level.

2. Methods

This is a cross-sectional study conducted in 8 large and middle-sized cities and areas in Shandong Province, including Jinan (the provincial capital of Shandong), Qingdao, Yantai, Jining, Weihai, Dezhou, Liaocheng, and Taian.

In this study, MSM are defined as men who have had sexual activity (anal or oral intercourse) with men in the past year, including male homosexuals, male bisexuals, and male heterosexuals who had sex with men, in the process of receiving commercial sexual services in restrooms, parks, and entertainment venues such as bars, night-clubs, and public baths. This special population was approached *via* a community-based network called the "Rainbow Group" that was voluntarily established among MSM from almost all cities and areas of Shandong Province with the support of experts from the Shandong Province Center for Disease Control and Prevention (Shandong Province CDC). Participants were recruited by snowball sampling due to the difficulty in approaching a hidden population and because of ethical considerations. To minimize the bias from sampling, initial interviewees selected represented diverse demographic, socioeconomic, and behavioral characteristics. Moreover, the interviewees were recruited from different communities and different places in order to improve the representativeness and the generalization of the sampling. As part of ethical considerations, all participants were informed about the study procedures and the investigation was conducted after their informed consent was obtained. The sample size was 1,617 persons in total.

Anonymous participants were personally interviewed using a semi-structured questionnaire that included demographic characteristics, sexual orientation, risk behaviors, and accessibility of related health services. Additionally, a serological test was performed to identify the HIV infection. Venous blood specimens collected from each participant were sent to the laboratory at the Shandong Province CDC. There, sera were separated from the specimens and a rapid HIV test was performed. Frequencies of variables were descriptively calculated using SPSS 11.5 (data analysis is currently underway).

3. Results and Discussion

3.1. *Demographic characteristics*

As shown in Table 1, nearly 70% of the surveyed MSM were in their twenties and the average participant age was 23 years. A majority of interviewees had a higher level of education (58.6%). As many as 74% were married or cohabiting with a member of the opposite sex. Interviewees self-identified as homosexual, heterosexual, and bisexual totaled 59.6%, 2.1%, and 31.2%, respectively. This suggests that the range of people exposed to a high risk of HIV and sexually transmitted diseases is widely expanded to include wives, sex partners, and consequently even other related populations (*4*). A previous review suggested that, as a result of their sexual activity, MSM served as an essential bridge for HIV transmission in sex workers (both male and female) and urban populations (*13*).

3.2. *HIV infection and HIV-related risk behaviors*

Table 2 summarizes the prevalence of HIV infection and HIV-related risk behaviors. According to the serological test, 18 persons were confirmed as being HIV-positive. The prevalence of HIV infection was 1.3% in the large and middle-sized cities of Shandong Province that were surveyed. Previous studies indicated the prevalence of HIV-positive individuals in related populations was 1.7% among "money boys"

Table 1. Demographic characteristics of MSM (n = 1,617)

	Number	%
Age		
< 20	19	5.9
≥ 20 - < 30	1,124	69.5
≥ 30 - < 40	340	19.8
≥ 40	77	4.8
Marital status		
Single	398	24.6
Married/cohabiting	1,196	74.0
Divorced/widowed	23	1.4
Education		
Middle school and below	233	14.4
High school	436	27.0
College/junior college and above	948	58.6
Occupation		
Student	409	25.3
Services	245	15.2
Ventures	98	6.1
Liberal occupation/unemployed	865	53.5
Sexual orientation		
Homosexual	946	59.6
Heterosexual	33	2.1
Bisexual	495	31.2
Not sure	113	7.1

Table 2. HIV infection and HIV-related risk behaviors (n = 1,617)

	Number	%
Serological test		
Positive	18	1.3
Negative	1,599	98.7
Drug user		
Yes	8	0.5
No	1,609	99.5
Consistent condom use in the past 6 months		
Anal intercourse with male		
Yes	791	48.9
No	826	51.1
Patronizing commercial sex		
Yes	741	45.8
No	876	54.2
Sex activities with women		
Yes	621	38.4
No	996	61.6

Table 3. Accessibility to HIV-related health services and information (n = 1,617)

	Number	%
HIV-related health services (multiple options)		
Free condom	1,095	67.7
Free lubrication	948	58.6
Peer education	446	27.6
Test and treatment of HIV/AIDS	488	30.2
Test and treatment of STD	307	19.0
HIV and STD counseling	952	58.9
Pamphlet	1,137	70.3
Preferring healthcare facilities for STDtreatment (multiple options)		
STD-special hospital	726	44.9
General hospital	380	23.5
Private clinic	249	15.4
Self medicine	283	17.5
No treatment	125	7.7
Others	6	0.4

(young male prostitutes) in Shanghai, China (*10*), 12.5% among gay and bisexual men in Los Angeles and New York City (*14*), 0.7% among MSM in Zurich (*15*), 11.0% and 6.9% among gay men in London and Glasgow, respectively (*16*), 19.1% among MSM in California (*17*), and 12% among young drug-injecting MSM in San Francisco (*18*). The assessment of HIV-positive individuals in those studies differed: some implemented a serological test while others relied on self-reported data. In the case of the latter, data on HIV-positive individuals may have been under-reported due to uncertainty as well as social stigma and discrimination. In general, the current study found a low prevalence when compared to that in metropolitan areas worldwide. This suggests that the size of the city in which MSM live may be a factor affecting HIV infection.

With regard to drug abuse, 8 of the total interviewees were drug users (0.5%). Of these, 3 had exchanged needles with others, which is a high risk behavior for HIV infection.

Interviewees were asked about consistent condom use in the past 6 months. The prevalence of unprotected anal intercourse with men, commercial sex, and sex with women was 51.1%, 54.2%, and 61.6%, respectively; the data were much higher than those in a study carried out in Beijing and Qingdao (*19*).

3.3. *Accessibility of HIV prevention health services and information*

Since 2005, the Chinese government has enhanced its intervention efforts targeting MSM, and various programs were conducted on condom promotion, testing and counseling, peer education, and follow-up outreach and care services for persons with HIV (*1*). Usage of HIV prevention health services including free condoms, free lubrication, and HIV & STD counseling and pamphlets was higher than 50% but usage of HIV & STD testing and treatment and peer education was relevantly low (Table 3). Reasons for this were probably the lack of perceived risk, lack of privacy and anonymity, uninteresting program content, and distrust and questionable credibility of providers, as indicated by an ethnographic study in China (*20*). Moreover, many interviewees did not even know that HIV & STD testing was provided for free.

The healthcare facility most favored for STD treatment by the MSM surveyed was a hospital specializing in STDs (44.9%). The main sources of information related to HIV prevention were television, freely distributed pamphlets, health education notices on the street, books, and magazines.

This study investigated the current state of HIV infection and the related behaviors of Chinese MSM in cities and areas of various sizes. Although HIV prevalence was low when compared to that in metropolitan areas worldwide, the prevalence of unsafe sexual behaviors was relevantly high and there was a lack of accessibility to HIV & STD testing and peer education. This study revealed the urgent need to make intervention programs universal, effective, and much more accessible to MSM in typical large and middle-sized cities in China.

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