HIV INFECTION AND MENTAL HEALTH OF "MONEY BOYS": A PILOT STUDY IN SHANDONG PROVINCE, CHINA

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Abstract. A pilot study was conducted in eight cities of Shandong Province, China to examine the seroprevalence of HIV and syphilis infection, and the mental health of "money boys" who were recruited by respondent-driven sampling and interviewed using a semi-structured questionnaire. The prevalence of the HIV-positive among money boys was 5.1%. Factors associated with the infection were having sex with women in the past 6 months (p <0.05) and suffering STD-like symptoms (p <0.01). The prevalence of syphilis was 10.2%. There were 77.2% participants engaged in such an occupation for economic survival. The prevalence of anxiety and depression among money boys was 46.6% and 68.1%, respectively. Heterosexual money boys were more likely to suffer from such mental symptoms. This study revealed the urgent need for interventions for HIV/AIDS control, together with mental counseling, targeting this vulnerable population.

Key words: HIV, syphilis, mental health, seroprevalence, China

INTRODUCTION

In China, HIV/AIDS epidemic continues to grow and is driven by especially high-risk behaviors among particular populations, including sex workers and their clients, drug users, and men who have sex with men (MSM) (UNAIDS, 2007). As sexual transmission is now the main mode for the spread of HIV, the number of people infected with HIV though both heterosexual and homosexual transmission is increasing.

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Money boys (MBs) are male sex workers who engage in homosexual activity with men for economic survival (He *et al*, 2007). Their clients are mainly MSM. There is a growing concentration of HIV-related risk behaviors among migrant MBs, a vulnerable group in urban society who are deprived of access to healthcare and social welfare services (McCoy and Yu, 1999; Hong *et al*, 2006; He N *et al*, 2006; He Q *et al*, 2007; Wang *et al*, 2007; Wong *et al*, 2008). Their sexual activities with men and women serve as a bridge of HIV transmission in MSM, sex workers, and the general population in urban areas (He N *et al*, 2006; He Q *et al*, 2007).

National projects for HIV/AIDS control targeting high-risk populations such

as sex workers and MSM have started with expanded health education through increased venues and the establishment of voluntary counseling and testing points at county level (UNAIDS, 2007). In China, however, political, cultural, and customary restrictions have hampered access to this population (Zhang and Chu, 2005; Liu *et al*, 2006). Several previous studies reported HIV-related risk behaviors, such as anal intercourse and unprotected sex, bisexual activities, lack of knowledge and awareness on HIV/AIDS, and lack of access of testing and other healthcare services among MSM in China (Choi *et al*, 2003, 2004, 2007; Jiang *et al*, 2006; Ma *et al*, 2007; Ruan *et al*, 2007; Zhang *et al*, 2007a; Zhang *et al*, 2007b; Lau *et al*, 2008). However, there are few studies that have focused specifically on MBs using either qualitative (He N *et al*, 2007b) or quantitative approaches (Mi *et al*, 2007; Liu *et al*, 2008; Wong *et al*, 2008), and none have implemented a serological test to confirm HIV infection.

During a previous study targeting MSM in urban areas of Shandong Province (Tao *et al*, 2008), we found that MSM often seek services from MBs in addition to their relations with their male partners; that unlike most MSM, MBs seemed to engage in such activities for economic survival; and that some suffered from mental problems. Their HIV seroprevalence, high-risk behaviors, and mental health status remain unclear, as there has been no study providing relevant information. Therefore, this study aimed to explore HIV seroprevalence and mental health among MBs in order to provide some inputs for the current HIV/AIDS control interventions in China.

MATERIALS AND METHODS

Study site

This pilot study used a cross-sectional approach as a follow-up on a previous study (Tao *et al*, 2008) that had targeted MSM, based on the recognition of issues specifically concerning MBs. The study site was same as the previous one, with the same eight cities randomly selected from 17 districts of Shandong Province, which is located in eastern China and has recently experienced urbanization. The level of socioeconomic development in the province is diversified: the eastern coastal area and the capital of Jinan Province are characterized by a more developed economy and more frequent socioeconomic and cultural exchanges with foreign countries compared to that seen in other areas of the province, with market-oriented and open-door reform. The study sites were expected to have wide representativeness in Shandong Province.

Target population and sampling

The subjects were those providing commercial sexual services to men in entertainment venues, such as bars, nightclubs, saunas, net-cafes and tearooms, for more than six months. Due to the difficulty of accessing such an inaccessible and ill-defined population, respondent-driven sampling (Heckathorn, 1997, 2002) was applied instead of random sampling. This sampling method is often used to recruit hidden populations such as MSM and drug users (Ma *et al*, 2007; Mimiaga *et al*, 2007; Liu *et al*, 2008; Stulhofer *et al*, 2008; Wong *et al*, 2008; Risser *et al*, 2009), with reduced bias of non-random sampling (Heckathorn, 2002).

The "seeds" (initial contacts) were 16 respondents selected in the eight cities from different venues, based on diverse demographic and socioeconomic characteristics, who were subsequently asked to refer 2-3 more MBs from their own network ties. Those peers were then asked to refer 2-3 additional recruits.

There has been only very limited evidence to estimate the population of MBs existing in the MSM society of China. Therefore, based on expert opinions and considering budget constraints, we estimated a sample size of 120 MBs for this study and expected to recruit them through four waves of successive recruitment. Excluding some withdrawals and those who refused to take the blood test, there were 118 MBs recruited for this pilot study.

Data collection

Participants were interviewed using a semi-structured questionnaire with both closed and open-ended questions (as a supplemental part). The main contents included socio-demographic characteristics, sexual orientation, risk behaviors, accessibility of health services related to HIV/AIDS control, and their experiences with and attitudes towards their work and mental problems. Each interview continued about 30 minutes.

To assess mental health, the Self-rating Anxiety Scale (SAS) (Zung, 1971) and Self-rating Depression Scale (SDS) (Zung, 1965) were used. The SAS and SDS are short self-administered tests that measure the anxiety and depression status, respectively, of a diverse population. They have been widely applied in psychological and social medicine studies (Dugan *et al*, 1998; Kumagai *et al*, 2005; Powell, 2005; Yamazaki *et al*, 2005; Liu *et al*, 2009). A score of 25-49 indicates the normal range, between 50 and 60 points indicates a mild symptom, and more than 60 points indicate a moderate-severe symptom. There were some participants who refused to answer questions regarding their mental health. Therefore, in analysis of those data we only included those participants who fully answered the questions.

In addition to the interview, a serological test was done to detect HIV and syphilis infections. Venous blood specimens collected from volunteer participants were tested by ELISA in the laboratory of the Shandong Province Center for Disease Control and Prevention (CDC) following the national standard of HIV detection. The serum sample of those detected HIV infection were sent for confirmation test and dealt with according to related laws and national guidelines.

Data analysis

Data were entered and analyzed by SPSS (Windows version 13.0). Data were divided into descriptive and inferential groups. Chi-square test, Fisher's exact test, and Kruskal-Wallis *H* test was performed with SPSS 13.0 for Windows as appropriate. A p-value < 0.05 was considered statistically significant. Content analysis was used for the qualitative data from open-ended questions.

Ethical consideration

The Ethics Committee for Research of Shandong CDC approved this study (Ref No. 07-08-25) for a period from August 2007 to December 2008, based on the following considerations: participants' names and personal information not be disclosed to protect their privacy and confidentiality, voluntary participation in the study, freedom to refuse and withdraw it at any time without any penalty, and measures preventing participants from any harmful effects, both physically and mentally. All participants were informed both verbally and in a written document about the study nature and purposes, study procedures and contents, ethical considerations mentioned above, and payment for participation. The investigation was started only after signed consent was obtained.

RESULTS

Socio-demographic characteristics

Among 118 participants, the average age was 23 years old. There were 76.3% MBs in their twenties, 15.2% younger than 20 years old, and 46.6% had an educational background of junior college or above. Although most of them were single, 7.6% (9/118) of them ever married with a woman. There were 16.1% MBs who had migrated from outside of Shandong Province. In terms of sexual orientation, although most MBs are homosexual, 36.7% and 8.5% self-identified as bisexual and heterosexual, respectively. Regarding sexual activity, 27.8% played an insertive role during homosexual intercourse, 11.4% played a receptive role, and as many as 60.8% took both roles. Among these MBs, as much as 77.2% engaged in this occupation for economic survival. Some were forced to perform unwanted sexual behaviors and experienced sexual violence by clients.

Seroprevalence of HIV infection and influencing factors

We collected blood samples from all 118 MBs and identified 6 HIV-positive cases in the laboratory of Shandong CDC. The prevalence of HIV infection was 5.1%. Table 1 presents socio-demographic and behavioral characteristics of the participants with HIV status. We identified 12 syphilis-positive cases; the prevalence was 10.2%. Eleven percent (13/118) reported recent STD-like symptoms. The results of Fisher's exact test suggested that MBs who had sex with women in the past 6 months ($p<0.05$), and those who recently suffered from STD-like symptoms ($p<0.01$) were more likely to be infected. Among the 6 cases HIV-positive cases, 4 individuals were students, and the other 2 worked in entertainment venues. Subjects were also further interviewed about their life history, which indicated whether they were homosexual or bisexual, and most of them reported that their first experience of sex was with men.

Risk behaviors

We found "risk behaviors in the past six months" among the surveyed MBs: anal intercourse, 98.3% (116/118); sex with women, 25.4% (30/118); and incomplete condom use, 58.5% (69/118). The prevalence of "self-reported drug use" among subjects was 8.5% (10/118). Among these 10 drug users, 7 had shared needles with others.

Accessibility of health services and interventions

According to the interviews, MBs received health services related to HIV/AIDS control that included free condoms (69.5%), free lubrication (64.4%), partner education (51.7%), screening and treatment of STDs (61.9%), counseling on HIV/AIDS (63.6%), and free educational pamphlets (77.1%), which was provided by provincial and city CDC, and other governmental sectors. Their sources of information on HIV/AIDS prevention included TV, free educational pamphlets, street bulletins, books, and magazines.

Mental health

Just over half (66.9%) of MBs mentioned their intent to marry because of pressure from their relations and society. They often experienced social discrimination, feeling they were objects of scorn or derision. They expressed their need for social support, at least a person to whom they could express their feelings. Due to their sexual orientation, some interviewees felt pressures and other inconveniences in life. There were approximately three participants who refused to give answer about their mental health. According to the results of Zung's SAS and SDS tests, the

Table 1
Demographic characteristics of HIV-positive individuals.

	n = 118	HIV+	%
Education			
College and above	55	4	7.3
Below college	63	2	3.2
Anal intercourse in past 6 months			
Yes	116	6	5.2
No	2	0	0.0
Sex with women in past 6 months[a]			
Yes	30	4	13.3
No	88	2	2.3
Condom use in past 6 months			
Complete	49	4	8.2
Partial or never	69	2	2.9
Drug user			
Yes	10	0	0.0
No	108	6	5.6
STD-like symptoms[b]			
Yes	10	3	30.0
No	108	3	2.8
Positive for syphilis			
Yes	12	2	16.7
No	106	4	3.8
Free condoms			
Yes	82	6	7.3
No	36	0	0.0
STD testing and treatment			
Yes	73	6	8.2
No	45	0	0.0
Received pamphlets			
Yes	91	6	6.6
No	27	0	0.0
HIV test in past year			
Yes	59	1	1.7
No	59	5	8.5

By Fisher's exact test
[a]$p<0.05$; [b]$p<0.01$

prevalence of anxiety and depression among MB was 46.6% and 68.1%, respectively. The proportion of mild and moderate-severe symptom was 31.9% and 14.7% for anxiety, and 20.7% and 47.4% for depression, respectively. The mean score of SAS and SDS was 48.1 and 53.2, with minimum of 28 and 25, and maximum of 73 and 74, respectively. Heterosexual MBs are more likely to suffer from both anxiety (p <0.05) (Table 2) and depression (p <0.05) (Table 3).

Table 2
Factors associated with prevalence of anxiety among MBs.

Factors	*n*	Normal (%)	Prevalence of anxiety (%)		
			Mild	Moderate-high	Total
Education					
College and above	56	51.8	28.6	19.6	48.2
Under college	60	55.0	38.3	6.7	45.0
HIV test in the past year					
Yes	58	44.8	39.7	15.5	55.2
No	58	62.1	27.6	10.3	37.9
STD symptom					
Yes	10	40.0	60.0	0.0	60.0
No	105	54.3	31.4	14.3	45.7
Marital status					
Single	98	53.0	33.7	13.3	47.0
Ever married	18	55.6	33.3	11.1	44.4
Interested in women					
Yes	32	68.7	25.0	6.3	31.3
No	45	60.0	28.9	11.1	40.0
Roles in sexual activities					
Insertive	21	47.7	33.3	19.0	52.3
Receptive	9	66.7	22.2	11.1	33.3
Both	47	70.2	25.5	4.3	29.8
Heterosexual[a]					
Yes	10	20.0	50.0	30.0	80.0
No	106	56.6	32.1	11.3	43.4
Pressures due to sexual orientation					
No pressure	24	70.9	20.8	8.3	29.1
A little pressure	38	52.7	36.8	10.5	47.3
High pressure	15	80.0	20.0	0.0	20.0
Inconvenience due to sexual orientation					
No inconvenience	26	69.3	19.2	11.5	30.7
A little inconvenience	41	58.6	34.1	7.3	41.4
Very inconvenience	10	70.0	30.0	0.0	30.0
Drug user					
Yes	10	30.0	60.0	10.0	70.0
No	105	55.3	31.4	13.3	44.7

By Kruskal-Wallis *H* test
[a]$p < 0.05$

DISCUSSION

This is the first study in China to assess HIV prevalence using serological testing and factors associated with the infection among MBs. The HIV-positive seroprevalence among MBs was 5.1%, which was much higher than the 1.3% among MSM, according to our previous study in Shandong Province (Tao *et al*,

Table 3
Factors associated with prevalence of depression among MB.

Factors	*n*	Normal (%)	Prevalence of depression (%)		
			Mild	Moderate-high	Total
Education					
College and above	56	32.2	19.6	48.2	67.8
Under college	60	31.6	36.7	31.7	68.4
HIV test in the past year					
Yes	58	36.2	27.6	36.2	63.8
No	58	31.0	25.9	43.1	69.0
STD symptom					
Yes	10	20.0	20.0	60.0	80.0
No	105	32.4	29.5	38.1	67.6
Marital status					
Single	98	30.6	28.6	40.8	69.4
Ever married	18	38.9	27.8	33.3	61.1
Interested in women					
Yes	32	40.6	9.4	50.0	59.4
No	45	42.3	28.9	28.8	57.7
Roles in sexual activities					
Insertive	21	23.8	19.0	57.2	76.2
Receptive	9	66.7	0.0	33.3	33.3
Both	47	44.7	25.5	29.8	55.3
Heterosexual[a]					
Yes	10	0.0	20.0	80.0	100.0
No	106	35.0	29.2	35.8	65.0
Pressures due to sexual orientation					
No pressure	24	45.8	29.2	25.0	54.2
A little pressure	38	42.1	31.6	26.3	57.9
High pressure	15	33.3	26.7	40.0	66.7
Inconvenience due to sexual orientation					
No inconvenience	26	46.4	22.8	30.8	53.6
A little inconvenience	41	36.6	39.0	24.4	63.4
Very inconvenience	10	50.0	10.0	40.0	50.0
Drug user					
Yes	10	30.0	20.0	50.0	70.0
No	105	31.5	29.5	39.0	68.5

By Kruskal-Wallis *H* test
[a]$p < 0.05$

2008), and 0.05% among general population in China (UNAIDS, 2007), suggesting the urgent need for interventions targeting MBs (Fig 1). Conversely, current accessibility of health services and interventions related to HIV/AIDS control, such as free condoms (69.5%), free lubrication (64.4%), partner education (51.7%), screening and treatment of STDs (61.9%), counseling on HIV/AIDS (63.6%), and free edu-

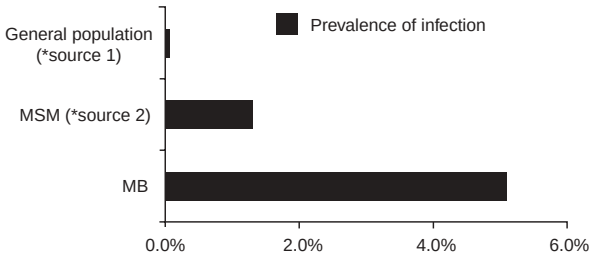

Fig 1–Prevalence of HIV infection among MB compared with that among MSM (Tao *et al*, 2008) and general population in China (UNAIDS, 2007).

cational pamphlet (77.1%) were not sufficient to cover all MBs.

Two factors were statistically associated with HIV infection: having sex with women in the past six months and recently suffering from STD-like symptoms. Previous studies on MSM in China and other countries have indicated that bisexual behavior could contribute to the exposure of MSM to the risk of the acquisition and transmission of HIV and STD and may serve as a bridge (He Q *et al*, 2006; Choi *et al*, 2007; Liu *et al*, 2008; Siegel *et al*, 2008). This can be explained by the association between having sex with women and HIV infection among MBs as well. Among the surveyed MBs, 7.6% were ever married, 36.7% bisexual, and 8.5% heterosexual; nearly 70% mentioned the intent to marry because of pressures from relations and the society, which suggests there are considerable opportunities for MBs to engage in bisexual activities and, consequently, their role as a bridge of HIV infection to MSM, women, and the general population.

Due to small size of sample and infectors, we could not establish a relationship between HIV infection and other factors, such as risk behaviors and syphilis infection. However, the results suggested that suffering from STD-like symptoms was associated with HIV infection. Unsafe sexual activities serve as a main transmission route for HIV/AIDS and STD. In this study, anal intercourse was common, and the rate of complete use of condom during sexual activities among MBs was only 41.5%. The prevalence of syphilis among the surveyed MBs was as high as 10.2%, which indicates a need to attend to the sexual activities among MBs.

The prevalence of anxiety and depression among MBs was 46.6% and 68.1%, respectively, and some tended to be reluctant to open up to the interviewers, suggesting that, besides the high risks of HIV and STD infection, mental health remains one of health problems among such the vulnerable population. Some MBs were forced to perform unwanted sexual behaviors and experienced sexual violence with clients. Many respondents experienced social discrimination, which is harmful for mental health (Kessler *et al*, 1999; Diaz *et al*, 2001; Meyer, 2003). Moreover, we found that heterosexual MBs were more likely to suffer from anxiety and depression. Engagement in homosexual activities, which is opposite to their sexual orientation, may be a contributor to the mental problems of heterosexual MBs. Based on the finding of this study, the motivation of heterosexual MBs to engage in such an occupation was for economic survival, which accounted for 77.2% of MBs. Many MBs reported social pressures and inconvenience in life due to their sexual orientation. Although many previous studies examined social discrimination and stigma attached to homosexuality in China (Liu and Choi, 2006; Choi *et al*, 2008; Neilands *et al*, 2008), all of them targeted MSM, most of whom did not seem occupationally or economically engaged in such activities. This small-scale pilot study provided some cues as to the determinant of mental health

among MBs. In future, the interactions of social discrimination, sexual orientation and motivations of homosexual engagement on MBs' mental health should be further studied.

Based on the findings of this study, interventions on HIV/AIDS control, such as improvement of protective measures in sexual activities, together with mental counseling, should be provided to MBs. Those interventions need to be easily accessible by MBs' in their working place, mainly entertainment venues.

The difficulty to access such a hidden population led to several limitations in this study. First, non-random sampling may restrict representativeness. To maximize the representative; however, participants were recruited from different communities and different working places in eight cities of Shandong Province. Second, due to drop-outs, budget constraint and uncertain size of MBs in MSM society, the sample size was relevantly small, causing limited statistical power to predict factors affecting HIV infection and mental health. We also recognized this pilot study was deficient in exploring determinants of their mental problems using a qualitative approach. A large-scale investigation, and intervention with affluently increased sample size and a qualitative approach to build relationship of determinants to HIV infection and psychological problems among Chinese MBs remains as an important subject for future research.

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