



Risk Behaviors and HIV/AIDS Prevention Education Among IDUs in Drug Treatment in Shanghai

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ABSTRACT *We estimated seroincidence of HIV, hepatitis B virus (HBV) and hepatitis C virus (HCV), and the prevalence of risk behaviors among injection drug users (IDUs) who accepted inpatient detoxification by 14-day methadone tapering treatment in the Shanghai Drug Abuse Treatment Center. We also evaluated the effect of an HIV/AIDS prevention education intervention on those IDUs. Data including demographic characteristics, HIV, HBV and HCV seroincidence, sexual and injection-related risk behaviors were collected from 101 IDUs. All subjects received HIV/AIDS prevention education during inpatient detoxification treatment. An HIV-knowledge questionnaire was used to evaluate the effects of this intervention. We found that risk behaviors, including unsafe sex and unclean injection practices, were common among the subjects. The seroincidence of HBV and HCV infection rates was 56.4% and 46.5%, respectively, but no HIV-infected case was found among the subjects. After participating in the HIV/AIDS prevention intervention, subjects' scores (M±SD) on the HIV-knowledge questionnaire were significantly improved from baseline (97.29±7.42 vs. 31.1±12.1). Our study confirmed that IDUs in Shanghai are a high-risk population for blood borne diseases such as hepatitis B and hepatitis C and HIV. HIV/AIDS prevention education increased HIV knowledge, improved understanding of HIV prevention methods and changed attitudes toward HIV/AIDS. Therefore, HIV/AIDS prevention education should to be an important component of drug treatment.*

KEYWORDS *Heroin dependent, HIV/AIDS prevention, Risk behavior.*

INTRODUCTION

HIV infection represents a major global public health challenge, and more than 90% of HIV infections are estimated to occur in developing countries.¹ As is the case in many African and South Asian countries, HIV infections and AIDS cases are increasing in China.² Currently, China's Ministry of Health estimates that 1 million persons are infected and predicts that 10 million persons will be infected by 2010 in the absence of urgent countermeasures.³ China's AIDS crisis consists of two separated and largely independent epidemics. The first is among rural peasants in the central China provinces and results from corrupt commercial

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trade in blood and plasma before 1997.⁴ The second epidemic began and remained concentrated along China's southern border with Burma and Vietnam, but has since spread to most of China's urban cities.⁵ It is primarily driven by one of the more familiar risk factors—*injection drug use (IDU)*.⁶ In the recent two decades, drug use problems in China have increased rapidly.⁷ Registered drug addicts numbered more than 100,000 by the end of 2002. In China, drug use is illegal, and the registered drug addicts only included those who were found by the public security system. It has been estimated that the actual number of drug addicts was 8–10 times greater than the number registered. Heroin is the primary drug used, and it is primarily used by injection (74%). Most of the drug users (78%) are young people between the ages of 18–35 years who are sexually active.⁸ Therefore, the intersecting epidemics of risk injection and unsafe sexual practices have led to an increasing risk of HIV transmission in China. To control the HIV epidemic, the Chinese government has developed a surveillance system for HIV infection and illegal drug use.⁹

Currently injection drug users (IDUs) account for 79% of all known HIV-infected cases in China. However, there is considerable variation in the rate of HIV infection among IDUs in different regions of China. At present, four provinces (out of 31) account for 77% of all HIV infection cases: Yunnan, Xinjiang, Guanxi, and Guangdong; Yunnan Province still has the largest number of cases.¹⁰ The available data from those areas have revealed that HIV infection rates are from 20% to 90% among IDUs and that the prevalence of risk behaviors is high.¹¹ However, reliable data are lacking for major cities in China. Shanghai, China's biggest and most developed city with a population of 17 million is located in the east coastal area of China, but only 800 HIV infections were reported in 2003, and most of these resulted from unsafe sex rather than IDU.¹² Shanghai appears to be at the beginning of an HIV epidemic, although HIV prevalence among IDUs has not been well studied. It is important to understand the status of risk behavior and HIV infection in areas with lower HIV infection rates such as Shanghai, because such information can be used to develop effective prevention strategies to reduce the likelihood of an HIV epidemic among IDUs and to reduce the potential for the transmission of HIV infection from high-risk groups such as IDUs to other populations.¹³

Numerous attempts have been made to educate IDUs to prevent the transmission of HIV. These attempts have ranged from community-based intervention, including street-outreach and needle-exchange programs targeted at IDUs, to HIV/AIDS education of IDUs, which teach both knowledge and skill building. Individualized HIV/AIDS education for IDUs typically is provided in the context of individual and/or group sessions and often as part of substance abuse treatment interventions.¹⁴ Studies have shown that this kind of education is effective in increasing participants' knowledge of HIV/AIDS and in changing their risk behaviors.^{15,16} To gain a better understanding of the risk behavior and the current rate of HIV infection among IDUs in Shanghai, this study estimated seroincidence of human immunodeficiency virus (HIV), hepatitis B virus (HBV) and hepatitis C virus (HCV), and the prevalence of risk behaviors among IDUs who accepted inpatient detoxification treatment. We also evaluated the effect of an HIV/AIDS prevention education intervention administered to the subjects. Such data are needed to inform the planning of programs and policies to safeguard against the spread of HIV/AIDS and other blood borne pathogens among IDUs.

METHODS

Setting and Participants

Participants were inpatients who were receiving methadone tapering detoxification in the Shanghai Drug Abuse Treatment Center. There are only two drug abuse treatment clinics in Shanghai. The Shanghai Drug Abuse Treatment Center is a public health government-supported facility which is located in the central area of Shanghai. Most patients are from local areas. The other clinic is a private one located in the suburbs of Shanghai, and most of its patients are from areas adjacent to Shanghai. Because our study focused on IDUs from Shanghai, we recruited the subjects from the Shanghai Drug Abuse Treatment Center.

At the time of their admission to inpatient detoxification treatment, clients were assessed for eligibility and interest in participating in this study. Inclusion requirements were being 18 years old; meeting the DSM-IV diagnostic criteria for opiate dependence in the previous month; and being an IDU based on self-report and verified by visual inspection for recent track marks. Subjects who had serious physical or mental illness, or intelligence deficits were excluded. Between October, 2003, and March, 2004, 164 IDUs were admitted to the drug abuse treatment center. Of 124 IDUs eligible for the study, 101 agreed to participate and provided voluntary informed consent.

Data Collection

Trained interviewers administered a structured questionnaire to the participants at intake. The instrument collected data on demographics, drug use history, and sexual and injection behaviors. The seroincidence of HIV, HBV, and HCV was obtained from the participant's medical record. All inpatients in the Shanghai Drug Abuse Treatment Center had routine laboratory screening including tests for the presence of antibodies to HIV, HBV, and HCV at admission.

HIV/AIDS Prevention Education

The HIV/AIDS prevention education intervention is focused on knowledge and skill building which consists of a series of three 45- to 60-minute group sessions led by two principal investigators (Min Zhao, and Qiu Y Wang) over a 2-week inpatient treatment period. The two investigators who implemented the HIV/AIDS prevention education had attended trainings on group skills and on the usage of the HIV/AIDS Prevention Education Manual at the Shanghai Minhang Center of Disease Control (CDC) for AIDS/STD. Each group consisted of 8–10 individuals, and the HIV/AIDS Prevention Education Manual designed by Shanghai Minhang CDC for AIDS/STD was used in the group sessions.¹⁶ The first session concerned general concepts of HIV/AIDS including means of transmission, the main symptoms, and outcomes. The remaining two sessions dealt with risk behavior and prevention tools for HIV/AIDS. We emphasized, for example, clarifying misconceptions, changing risk behaviors concerning sexual behavior and drug use, demonstrating condom use, and teaching clean injection skills. A variety of activities such as interpretation, demonstration, discussion, video taping, poster creation, role playing, practice, assignment, answering of questions, and other methods were implemented in the group sessions. All participants attended the three sessions.

Measures

The HIV/AIDS-knowledge questionnaire was designed according to the HIV/AIDS Prevention Education Manual from Shanghai Minhang CDC. It consisted of 50

“yes” or “no” items to measure HIV/AIDS-related knowledge. The questionnaire assessed ten domains: definitions, outcomes, HIV testing, risky sexual behavior, safe sex, transmission, unclean drug use, prevention, healthy life style, and attitude toward HIV/AIDS. (Sample items: “You can be infected with HIV while your blood test for HIV is negative,” “Cleaning injection needles with water is enough to kill the AIDS Virus,” “You can be infected with HIV and not show any signs of illness.”) Each domain had five items with each correct answer receiving a score of 2. Therefore, the total possible score of each domain was 10, and the total score possible for the HIV/AIDS-knowledge questionnaire was 100. A higher score indicates that the respondent has more HIV/AIDS-related knowledge. This HIV/AIDS knowledge questionnaire was administered to the participants to assess their HIV/AIDS-related knowledge at baseline and again after their HIV/AIDS prevention education. Two staff members conducted the assessments in small groups (5–6 persons). The two assessors did not know the content of the HIV/AIDS education program, and they were trained before the study to assure the consistency of use of the questionnaire. To ensure comprehension of assessment questions and maintain anonymity, participants responded by writing in their individual assessment booklet, whereas one staff member showed the questions on an overhead and read each item aloud. The assessment required approximately 30 minutes to complete.

Statistical Analyses

The Statistical Package for Social Science (SPSS, Version 9.0) was used for all data analyses. Descriptive analyses were applied to demographic and clinical data. Sample Paired *t* tests were used to compare the mean scores on the HIV/AIDS-knowledge questionnaire at baseline and after the HIV/AIDS prevention education. The level of statistical significance was set at 0.05.

RESULTS

Demographic and Clinical Characteristics

The participants had an average age of 27.3 ± 6.2 ($M \pm SD$) years, and most were males (69.3%). About half (52.5%) of the subjects were unmarried, 43.5% were married, and 4% were divorced. Over a quarter (29.7%) of the participants were self-employed, whereas 67.3% were unemployed, 1% were staff and another 1% were students. Education typically was below junior middle school (74.2%). Almost a quarter (22.8%) of the subjects had only finished their preliminary school, 51.4% had finished their junior middle school, 24.8% had graduated from senior middle school, and only 1% had finished a college education. All of the 101 injection heroin users met the DSM-IV criterion for opiate dependence with an average drug use history of 63.8 ± 41.9 ($M \pm SD$) months. Heroin injectors had an average IDU history of 48.6 ± 28.4 months. Their age at first drug use was 21.3 ± 4.2 years, and they had injected heroin 4.6 ± 2.4 times per day in the previous month.

Prevalence of Risk Behaviors and Seroincidence of HIV, HBV, and HCV

Among the IDUs, use of unclean injection was very common. Ninety-seven percent of the subjects reported that they had practiced at least one of the following four unclean injection behaviors: 82 (81.2%) participants had used their syringes repeatedly, 27 (26.7%) had shared syringes with other drug users, 40 (39.6%)

had not sterilized their syringes when they injected drugs, 54 (53.5%) had not used sterile solvent. (Fifty-four percent of the subjects reported two or three unclean injection behaviors, therefore, the category percentages exceed 100%.) Ninety-six of the 101 participants (95%) had engaged in sex behavior in the previous months, and most of them (68.3%) had drug using sex partners. Eighty-two (81.2%) reported that they did not use condoms, and 8 (7.9) stated that they had more than one sexual partner. The laboratory test results disclosed 57 HBV-infected cases (56.4%), and 47 HCV-infected cases (46.5%); no HIV-infected cases were found.

The Effect of HIV/AIDS Prevention Education

The Table compares the mean scores and standard deviation ($M \pm SD$) for the components of the HIV/AIDS-knowledge questionnaire at baseline and after the HIV/AIDS prevention education. The total score on the HIV/AIDS-knowledge questionnaire at baseline was 31.1 ± 12.1 , versus 97.29 ± 7.42 at posttest. These average scores show that the participants had a very low level of HIV/AIDS-related knowledge at baseline and that after the HIV/AIDS prevention education, the total score and the domain scores were improved significantly ($P < .01$). After the intervention nearly all participants demonstrated a high level of HIV/AIDS knowledge.

Subjective evaluations made by the participants were also investigated. The answers to “how much help did you think this HIV/AIDS prevention education provided to you” were as follows: great help 75.2%, help 18.8%, a little help 5.0%, and no help at all 1%. The answers to “how important do you think this HIV/AIDS prevention education was to you” were as below: very important 78.2%, important 18.8%, a little important 2.0%, and not important at all 1%. About two-thirds (66.3%) reported that they had participated actively, 28.7% said that they were “cooperative,” and the rest (5.0%) participated passively. These results indicate that the participants had a positive and welcome attitude to the HIV/AIDS prevention education during their drug treatment and most participated actively.

TABLE. HIV/AIDS knowledge before and after HIV/AIDS prevention education

	Baseline (n = 101)	After HIV/ AIDS prevention education (n = 101)	<i>t</i>	<i>P</i>
Definitions (M ± SD)	3.56 ± 1.71	9.86 ± 0.65	34.3	<.01
Outcomes (M ± SD)	3.58 ± 1.84	9.84 ± 0.56	15.2	<.01
Transmission (M ± SD)	2.44 ± 1.78	9.34 ± 2.47	22.7	<.01
HIV testing (M ± SD)	6.90 ± 3.47	9.88 ± 2.40	6.63	<.01
Prevention (M ± SD)	3.86 ± 2.35	9.90 ± 0.49	24.56	<.01
Risk sexual behavior (M ± SD)	1.76 ± 1.27	9.74 ± 1.12	49.74	<.01
Unclean drug use (M ± SD)	3.42 ± 2.20	9.76 ± 0.91	27.13	<.01
Safe sex (M ± SD)	2.53 ± 1.69	9.88 ± 0.84	39.30	<.01
Health life style (M ± SD)	2.34 ± 1.25	9.44 ± 1.81	32.01	<.01
Attitude to HIV/AIDS (M ± SD)	0.69 ± 2.55	9.40 ± 2.38	23.98	<.01
Total score (M ± SD)	31.1 ± 12.1	97.29 ± 7.42	45.05	<.01

The *t* value is from a paired *t* test.

DISCUSSION

Unlike previous investigations in other areas of China that estimated the seroincidence of HIV at 20%–90% among IDUs,¹¹ this investigation found no HIV-infected cases among the 101 heroin-dependent patients who sought inpatient detoxification in Shanghai. Previous investigations have revealed that there is considerable variation in the rates of HIV infection among IDUs across China. Although the HIV prevalence among IDUs in Shanghai is unclear, the available data show that Shanghai has a lower HIV prevalence than other cities in China. In Shanghai, only 800 HIV infections were found in 2003, most of whom were infected through unprotected sex practice.¹² The results from recent HIV infection screening tests in a rehabilitation labor camp (a compulsory rehabilitation setting for drug addicts) in Shanghai showed that less than 10 HIV-infected cases were found among more than 1,000 heroin addicts (unpublished data, March 2005). Our results seem to confirm the evidence that Shanghai has a low HIV prevalence rate among drug-use populations. One reason that no HIV infection cases were detected in this study may be that the number of subjects is not large enough to detect the low prevalence. This may indicate that Shanghai is just at the beginning stage of an HIV epidemic.

This study supports previous investigations that indicated a high prevalence of risk behaviors for HIV/AIDS, including both unclean injection and unsafe sex among IDUs. The study also revealed that the participants had a HIV/AIDS-related knowledge deficiency.¹⁷ Our results also supported the conclusion that, although there are high-risk behaviors for HIV infection among IDUs in China outside Yunnan and Xinjiang province, the prevalence of HIV is low in some large urban cities.¹⁸ The high prevalence of risk behaviors for HIV infection among IDUs found in this study indicates that the IDUs in Shanghai are a high-risk population for HIV infection and other blood borne virus infections such as HBV and HCV infections. The seroincidence of HBV and HCV (56.4% and 46.5%, respectively in this study) were much higher than that (about 10% for each) in the general Chinese population, but they were relatively lower than those in other areas of China (87.4% and 90.2%, respectively).¹⁹ Shanghai, located in the east coastal area of China is the biggest and most developed city in China. Shanghai is much different from Yunnan, Xingjiang and, other high HIV prevalence areas in terms of economics, industry, cultural environment, people's attitudes, and lifestyle. Consequently, the IDUs in Shanghai may have less economic pressure to trade sex for drugs and engage in other risk behaviors, and this may result in relatively lower HIV, HBV, HCV, and other blood borne virus infections. This was supported by our results that there was a lower prevalence of shared syringes (26.7%) than that in other areas (60%–90%).^{10,18,19} Further epidemiological studies are needed to understand the difference in the prevalence of risk behaviors and HIV and other blood borne pathogens among IDUs in different areas of China.

Because there is neither a cure nor a vaccine against HIV/AIDS, behavioral change provides the only protection against infection. Efforts to prevent or reduce risk of HIV infection through behavior change begin with an understanding of the determinants of risk behavior. HIV/AIDS-related knowledge has been identified as an important determinant of risk behavior.²⁰ Accordingly, most intervention programs provide information about HIV-related transmission and prevention to help participants to reduce their risk of infection. This approach has been proven effective.^{21,22} In this study, we also implemented an HIV/AIDS prevention education program with the focus on providing HIV/AIDS-related knowledge. Our results

showed that the program increased HIV/AIDS-related knowledge. The results showed that the IDUs had a HIV/AIDS knowledge deficiency at baseline, and that the total score on the HIV/AIDS knowledge questionnaire improved significantly after the HIV/AIDS prevention education program. Our results support the conclusions from other studies that HIV/AIDS education can increase HIV/AIDS-related knowledge.^{14,15} Marsch and colleagues reported that the average accuracy score on the HIV/AIDS information after a computer- and a therapist-delivered HIV/AIDS education is 97% and 89%, respectively.¹⁵ We also found that the subjective evaluation from the participants was supportive and positive indicating that HIV/AIDS prevention education was feasible during drug abuse treatment. Further follow-up studies are needed to study the effect of increasing HIV/AIDS-related knowledge on behavior change.

This preliminary study about risk behavior and HIV/AIDS prevention education among IDUs in drug treatment in Shanghai supported the perception that IDUs in Shanghai present risk behaviors for HIV, HBV, and HCV infection, but have a low HIV prevalence at present. HIV/AIDS prevention education had the effect of increasing HIV knowledge, improving understanding of HIV prevention methods, and changing attitudes toward HIV/AIDS. Therefore, HIV/AIDS prevention education should continue to be an important component of drug treatment. The main limitation of the portion of this study that assesses prevention education is that there is no control group. The fact that subjects answered more items correctly after the intervention could be due to their feeling better and having improved cognition of the questions after 2 weeks of treatment. Further studies with a more rigorous design should address the effect of prevention education in this population.

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