

# AIDS Awareness and Condom Use Among Patients in a High-HIV-Prevalence Area in Rural Northern Anhui, China

Nai-Ling Mao, MMed, Hai-Feng Pan, MD, Man-Man Lu, MD, Se-Ying Dai, MD, Gui-Mei Chen, MD, Min Tian, MMed, Zhang-Jun Huang, MMed, and Dong-Qing Ye, MD

**Abstract:** The objective was to assess AIDS awareness and condom use in a rural northern Anhui area with a high HIV prevalence. One hundred two AIDS patients underwent a structured interview using a standard questionnaire. There were 51 female and 51 male patients, whose mean age was  $46.27 \pm 7.27$  years and who had good knowledge of AIDS-related issues. More sexually active patients than those nonactive ones knew it more properly that AIDS was a blood-borne disease (100% vs 94.4%;  $P = 0.03$ ). Significantly more female patients than male (62.7% vs 47.1%;  $P = 0.047$ ) knew AIDS is incurable. Self-perceived risk was low, and only 84 respondents regarded the condom use as a common problem in their area. Two independent factors associated with a higher rate of condom use were the AIDS patients' income level and their knowledge about condom use. There was statistically significance between the patients who regularly obtained free condoms and those who did not. The patients who bought condoms on their own initiative had a higher chance of using condoms than those who did not. In conclusion, despite a high level of awareness of HIV/AIDS issues, self-perceived risk was low, condom use was infrequent, and especially men continued to have multiple sexual partners.

**Key Words:** HIV, heterosexual transmission, condom use, prevalence area

(*J Investig Med* 2010;58: 801–803)

Nowadays, the HIV epidemic situation in China is still rising, in which there is the danger of the further spread. By the end of October 2007, 200,000 people had been dead, whereas 44.7% of 50,000 new HIV infection cases in China had occurred by the heterosexual transmission at the same time. The way that spread through the sexual intercourse has become the main spread path.<sup>1</sup> Since the first report of the AIDS case at the end of 1994, the HIV infectors have been increasing rapidly in Anhui province. Up to September 2006, 4227 patients with HIV had been found in this province, 1980 of which were AIDS cases, and 631 of which died. Linquan county of Anhui province belongs to China Comprehensive AIDS Response, being one of the China Global Fund AIDS Program counties.<sup>2</sup> During the 1990s, because of the illegal and irregular blood collection, the villagers of some villages were infected with HIV in rural

northern Anhui, in which the peak of the outbreak and death has appeared. Because of the lack of understanding and knowledge on AIDS, those young and middle-aged villagers who were infected with HIV at that time through blood selling have actually become the terrible source of the AIDS spread in the countryside in north Anhui.<sup>3</sup> These blood sellers were infected unconsciously and then infected their spouses. Therefore, changing the sexual behavior, especially for adopting some protective measures such as using a condom during sex, can reduce the spread of HIV effectively. It has been found by the researchers that those with HIV can transmit the disease to their spouses through sex. Unsafe sexual behaviors not only can cause the spread of HIV, but also can transmit the drug-fast virus strains produced through the antiretroviral therapy in those infected to the HIV-uninfected sexual partners, which means controlling over the spread of HIV through sexual path is the key to control AIDS prevalence. A large amount of investigations indicates that correct use of condoms can effectively prevent the spread of HIV through sexual path.<sup>4</sup>

## SUBJECTS AND METHODS

### Subjects

A cluster-sampling method was used in the study. Linquan was a high-HIV-prevalence area in rural northern Anhui. There were eight villages in all; we randomly selected 2 villages by cluster sample for the full survey. One hundred two AIDS patients in 2 villages were selected, and there was willingness of village leaders to collaborate in the study. The project was considered and approved by Anhui Medical University Bio-research Ethics Committee. Written informed consent was obtained from each participant after a full explanation of the study.

A standardized structured questionnaire was administered to collect sociodemographic data, AIDS awareness information, sexual behavioral surveys, and condom use information. The evaluations of questionnaire were from validity, reliability, and acceptability. The content validity index was 0.802; a construct validity analysis showed 4 principal components: socio-demographic, AIDS awareness, sexual behavioral surveys, and condom use, which can be divided into 45 items. Pearson correlation coefficient of the criteria-related validity was 0.826. Cronbach coefficient  $\alpha$  of consistency was 0.9352. The coefficient of stability was 0.715. The questionnaire had an acceptable content, construct validity, and reliability. The medical students from Anhui Medical University were recruited and trained as interviewers. The interviews were conducted at the home of the participant.

### Statistical Analyses

Data were independently entered twice and validated using Epi data software, version 3.1 (a freeware distributed by Epi Data Association, Odense, Denmark; available for download

From the Department of Epidemiology and Biostatistics, School of Public Health, Anhui Medical University, Anhui, People's Republic of China.

Received February 6, 2010, and in revised form May 10, 2010.

Accepted for publication May 12, 2010.

Reprints: Dong-Qing Ye, MD, Department of Epidemiology and Biostatistics,

School of Public Health, Anhui Medical University, 81 Meishan Rd, Hefei, Anhui, 230032, PR China. E-mail: ydq@ahmu.edu.cn.

Supported by United Nations Theme Group on Gender

(UNTGG, 2007-2-13) and Global Fund for AIDS program in Anhui, China.

Copyright © 2010 by The American Federation for Medical Research

ISSN: 1081-5589

DOI: 10.2310/JIM.0b013e3181e80188

at <http://www.epidata.dk/download.php>). All statistical analyses were performed using SPSS software, version 10.01 (SPSS, Chicago, IL). Frequencies, percentage ratios, and  $\chi^2$  tests were used to evaluate the obtained data, and logistic regression analysis was to test for independent factors associated with condom use ( $P < 0.05$  was considered statistically significant).

**RESULTS**

A cumulative total of 102 AIDS cases were investigated in Linquan. Among all AIDS cases, the mean age was  $46.27 \pm 7.27$  years, ranging from 33 to 63 years; 51.9% had a primary or secondary school education, and 44.1% were illiterate; compared with female, male had a higher illiteracy rate (68.6% vs 19.6%;  $P < 0.001$ ); 59.8% were farmers. Compared with female, male had a significant difference in rates of employment status (82.4% vs 38.8%;  $P < 0.001$ ), and family annual income was  $1340 \pm 826$  yuan. The main way spouses were infected with HIV was through blood selling. Of 102 AIDS cases, 61.8% reported a history of selling whole blood or plasma.

All 102 interviewees had heard of HIV/AIDS, knowing better about the HIV transmission modes and their prevention, as shown in Table 1 consisting of the subgroups male versus female, condom user versus nonuser, and sexually active versus nonactive. Of the interviewed patients, 82.4% had already been sexually active, but only 17.9% of interviewees with partners were using condoms. More sexually active patients than non-active were aware of AIDS being a blood-borne disease (100% vs 94.4%;  $P = 0.03$ ). Significantly more female patients than male (62.7% vs 47.1%;  $P = 0.047$ ) knew AIDS is incurable. Self-perceived risk was low, and only 84 respondents regarded the condom use as a common problem in their area.

The factors were found to be associated with condom use in a logistic regression model including age and personal annual income (Table 2). The patients aged between 50 and 63 years were more likely to use condoms than those aged between 30 and 39 years. The patients with a higher level of income were more likely to use condoms than those with a lower level. The patients who correctly answered the questions about condoms were more likely to use condoms than those who answered them erroneously. The condom usage rate was 14.7%; multiple-sexual-partners condom usage rate was 15.6%; 45.1% of the patients felt ashamed when they obtained condoms free of charge; 27.5% of the patients would buy condoms on their own initiative. Of the patients, 25.5% had received training about condom use. There was statistical significance between the patients who regularly obtained free condoms and those who did not. The patients who bought condoms on their own initiative had a

**TABLE 2.** Logistic Regression Analyses Assessing Relationships and Selected Factors Between the AIDS Patients and Condom Use

Factor	Adjusted OR (95% CI)
Age, y	
30–39 (Reference)	1
40–49	1.56 (0.32–1.72)*
50–63	15.12 (4.37–53.76)†
Personal annual income, yuan	
≤1000 (Reference)	1
1001–2000	1.08 (0.56–1.67)*
2001–3000	0.91 (0.31–2.96)*
3001–4000	1.96 (0.88–3.52)*
>4000	3.75 (2.04–19.71)†
Considered condom use can prevent AIDS	1.57 (1.21–3.92)†
Obtains free condoms regularly	2.51 (1.76–4.80)†
Ever bought condom on his/her own initiative	6.42 (3.05–19.73)†
Received training about condoms	1.35 (1.02–1.98)†

\*Not statistically significant.  
 † $P < 0.05$   
 OR indicates odds ratio; CI, confidence interval.

higher chance of using condoms than those who did not. Patients who had received training about condom use were more likely to use condoms than those who did not have this opportunity.

**DISCUSSION**

This survey was conducted in an area of high AIDS prevalence to examine AIDS awareness and condom use among AIDS patients in rural northern Anhui, China. All of the interviewees were from rural areas where a high proportion of adult villagers had donated plasma and had been infected with HIV through the commercial blood donation process. Although AIDS awareness was high regardless of age, sex, school attendance, condom use, and sexual activity ( $\geq 1$  partners), the prevalent sexual behavior still favored ongoing HIV transmission.<sup>5,6</sup> The low rate of condom use, which had also been reported in other studies, was a factor in HIV transmission between AIDS patients and their partners<sup>7</sup>; in this study, the rate of condom use and the rate of multiple-sexual-partners condom usage were low. People had low self-perceived risk. In the rural households of China, the

**TABLE 1.** Knowledge of HIV/AIDS-Related Issues

	Total n = 102	Male (n = 51)	Female (n = 51)	Sexually Active (n = 84)	Condom User (n = 15)	Non-User (n = 69)	Not Active (n = 18)
AIDS is a communicable disease	94 (92.2)	50 (98.0)	44 (86.3)	78 (92.9)	13 (86.7)	65 (94.2)	16 (88.9)
AIDS is incurable	56 (54.9)	24 (47.1)*	32 (62.7)	45 (53.6)	6 (40.0)	39 (56.5)	11 (61.1)
Knowing a person with HIV/AIDS	91 (89.2)	45 (88.2)	46 (90.2)	74 (88.1)	14 (93.3)	60 (87.0)	17 (94.4)
AIDS is a blood-borne disease	101 (99.0)	50 (98.0)	51 (100.0)	84 (100.0)*	15 (100.0)	69 (100.0)	17 (94.4)
Sexual mode of transmission	93 (91.2)	44 (86.3)	49 (96.1)	75 (89.3)	15 (100.0)	60 (87.0)	18 (100.0)
Condom is protective	96 (94.1)	47 (92.2)	49 (96.1)	79 (94.0)	15 (100.0)	64 (92.8)	17 (94.4)

Values are presented as n (%).  
 \* $P < 0.05$ .

lack of economic independence made people more vulnerable to poverty and sex inequity, and husband was at the leading position in the family. Some patients saw no need to use condoms when both they and their partners had the same HIV status. A survey from Africa showed that sex inequity limited women's ability to negotiate safe sexual behaviors with their partners, and that this lack of negotiating power increased women's chances of becoming infected with sexually transmitted infections/HIV.<sup>8</sup> Therefore, a combination of commercial blood donation and unprotected sex put people at the risk of HIV infection. The findings indicated higher HIV-related risks among AIDS patients, with a potential for HIV to be transmitted from them to their partners.

Condom is cost-effective for HIV prevention and control.<sup>9</sup> In this study, 2 independent factors associated with a higher condom use rate were the AIDS patients' income level and their knowledge about condom use. One variable significantly associated with regular condom use was buying condoms on one's own initiative. As other studies have reported, the use of condoms would increase if more condoms were distributed free of charge.<sup>10</sup> The World Health Organization and the Joint United Nations Programme on HIV/AIDS have been encouraging the introduction of the condom use to help protect AIDS patients against cross-infection.<sup>11</sup>

In the rural northern Anhui, a number of special sociality and culturally inherent barriers to the adoption of condom use have to be considered. First, sex inequalities characterized by a symbiotic coexistence of male-dominated decision making concerning sexual matters on one side and traditionally submissive female acceptance on the other side make communication between partners and negotiation of sex safety difficult.<sup>12</sup> The second major obstacle to behavior change is the low educational level of people with HIV in rural China.<sup>13</sup> Some patients saw no need to use condoms when both they and their partners had the same HIV status, while they did not know the importance of condom use. Third, although condoms have become more acceptable, the use of it is still derogatory, symbolizing unstable, mistrust, and promiscuous relationships.<sup>14</sup> Thus, condom use rate is generally low across the Chinese continent<sup>15</sup> and is much lower in rural areas. Our study suggests that more attention be paid to the females infected with HIV, their capability of communication, negotiation of sex with their husbands, and a delimitation of their humiliation of accessing free condoms. The findings of this baseline survey could foster further research. More educational interventions should be implemented to expand condom knowledge and promotion, especially for AIDS patients and their partners. It should be stressed that patients must take responsibility for the consequences of their sexual behavior, respect their partners, and protect them against HIV infection.

## ACKNOWLEDGMENTS

The authors thank all subjects for their enthusiastic participation in this study.

## REFERENCES

1. State Council AIDS Working Committee Office UN Theme Group on AIDS in China. *A Joint Assessment of HIV/AIDS Prevention, Treatment and Care in China*. Beijing, China: Ministry of Health of China; 2007.
2. Lu L, Yang F, Wu ZY, et al. Analysis of factors of AIDS knowledge in HIV/AIDS patients in a rural area in Fuyang City, Anhui Province. *China Trop Med*. 2004;4:194–196.
3. Qin QR, Ji GP, Ye DQ. Condom use and knowledge among married women in rural areas of China. *Int J Gynecol Obstet*. 2009;105:175–176.
4. Huang L, Ye DQ, Qin QR. Study on condom uses skill and self-efficacy among patients with HIV. *Chin J Dis Control Prev*. 2008;12:137–140.
5. Hu XY, Zhang CN, Li L, et al. Effect of AIDS health education among rural women. *Chin J Health Educ*. 2002;18:657–658.
6. Zhou YJ, Liu W, Liang SL, et al. KAP about AIDS among rural women in AIDS epidemic area. *Chin J Health Educ*. 2002;20:514–515.
7. Hesketh T, Li L, Ye X, et al. HIV and syphilis in migrant workers in eastern China. *Sex Transm Infect*. 2006;82:11–14.
8. Mark H. The changing political economy of sex in South Africa: the significance of unemployment and inequalities to the scale of the AIDS pandemic. *Soc Sci Med*. 2007;64:689–700.
9. World Health Organization. Effectiveness of condoms in preventing sexually transmitted infections including HIV. Available at: [http://www.who.int/reproductive-health/stis/male\\_condom.html](http://www.who.int/reproductive-health/stis/male_condom.html). Accessed February 11, 2009.
10. Rhodes SD, Hergenrather KC, Yee LJ, et al. Condom acquisition and preferences within a sample of sexually active gay and bisexual men in the southern United States. *AIDS Patient Care STDS*. 2007;21:861–870.
11. Regina MB, Suzana K, Elza B, et al. Notes on the female condom: experiences in Brazil. *Int J STD AIDS*. 2007;18:261–266.
12. Donovan B, Ross MW. Preventing HIV: determinants of sexual behaviour. *Lancet*. 2000;355:1897–1901.
13. Hong H, Qin QR, Ye DQ, et al. Condom use among married women at risk for sexually transmitted infections and HIV in rural China. *Int J Gynecol Obstet*. 2009;106:262–265.
14. Varga CA. The condom conundrum: barriers to condom use among commercial sex workers in Durban, South Africa. *Afr J Reprod Health*. 1997;1:74–88.
15. Wu Z, Rou K, Cai H. The HIV/AIDS epidemic in China: history, current strategies and future challenges. *AIDS Educ Prev*. 2004;16:7–17.