

Preplanned Studies

Oral Sexual Behavior Among HIV-Infected Men Who Have Sex with Men — China, February 2021

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Summary

What is already known about this topic?

Unprotected oral sex carries a risk of the transmission of sexually transmitted infections (STIs), especially if the individual has poor oral health.

What is added by this report?

Most human immunodeficiency virus (HIV) infected men who have sex with men (MSM) had never used a condom when giving oral sex (89.30%, 718/804) or receiving oral sex (90.32%, 709/785). Among MSM with detectable viral loads who had ever received oral sex without a condom, 40.00% reported ejaculation in their partner's mouth.

What are the implications for public health practice?

Unprotected oral sex is very common among HIV-infected MSM in China. The public health sectors in China should recommend condom use during oral sex among HIV-infected MSM, especially when in-mouth ejaculation is involved.

Oral sex is one of the most common sexual activities. Although evidence supports that unprotected oral sex carries a risk of the transmission of sexually transmitted infections (STIs), especially if the individual has a poor oral health, the risk of human immunodeficiency virus (HIV) transmission through oral sex is much lower than that through anal sex (1). Many people, including people living with HIV (PLWH), may think that oral sex carries little or no risk for the transmission of HIV and other STIs. After knowing their HIV status, they may increase the frequency of oral sex and decrease that of anal sex in order to minimize HIV transmission to others. As a result, PLWH may be more likely to have regular oral sex than the uninfected population (2). Unprotected oral sex is common among men who have sex with men (MSM) (3). A cross-sectional study from China showed that only 6.87% of 5,181 MSM reported condom use in their last oral sex (4). Sarah et al. found that a higher proportion of HIV-infected

MSM (75.00%) reported having oral sex than uninfected MSM (59.00%) (2). Another study from Thailand showed that 85.00% of HIV-infected MSM had reported unprotected oral sex, significantly higher than the proportion of unprotected anal sex (32.00%) (5). The purpose of the current study was to investigate oral sexual behavior and factors associated with the use of condoms in oral sex among HIV-infected MSM in China. Most participants in this study never used a condom when giving oral sex (89.30%, 718/804) or receiving oral sex (90.32%, 709/785). Among the 85 participants with a detectable viral load who received oral sex without a condom, 40.00% reported that they had ever ejaculated in their partner's mouth. It is necessary for clinicians and public health practitioners to develop targeted education and interventions for HIV-infected MSM to minimize the risk from unprotected oral sex.

We conducted a nationwide cross-sectional online survey in February 2021 in China. Convenience sampling was applied in this study. A total of 873 eligible participants were recruited through Li Hui Shi Kong, a WeChat official account with more than 76,000 HIV-infected followers. Details of the description of Li Hui Shi Kong are available in a previously published literature (6). Eligibility criteria included self-identified MSM, having oral sex with at least one man in the past six months, and having a known diagnosis of HIV. The following measures were taken to ensure the quality of the questionnaire results: 1) each mobile phone or computer could only be used once; 2) a pre-investigation of 12 HIV-infected MSM was conducted to modify questionnaires before the formal launch of the survey; 3) invalid questionnaires were identified by the logic checks built into the back-end system; 4) quality-controlled questions were designed to exclude participants filling in wrong answers (e.g., "How many seasons are there?"); 5) participants who finished questionnaires within a short answer time (less than 5 minutes), and those who chose the same option in all choice questions were also

excluded. Every eligible participant received a reimbursement of 4.6 USD to 15.4 USD as an incentive through an online random lottery. Oral sexual behaviors included the following questions: in the past six months, 1) type of oral sex (given, received, or both); 2) frequency of oral sex; 3) number of oral sex male partners; 4) condom use when giving or receiving oral sex; 5) ever ejaculated in partners' mouth; 6) mouthwash use before or after performing oral sex. To ensure that all participants were using the same definition of oral sex, a short statement was given on the survey, defining giving oral sex as "putting your mouth on your partner's penis (Oral-Penis)" and receiving oral sex as "putting your penis in your partner's mouth (Penis-Oral)." Unprotected oral sex in this study was defined as the absence of condom use during oral sex.

The chi-squared test was used to compare the oral sexual behavior between different viral loads of HIV in the last six months of HIV-infected MSM. Univariate logistic regressions were performed to identify factors potentially associated with unprotected oral sex. Odds ratios (OR) and 95% confidence intervals (CI) were calculated in univariate analysis. Variables with $P < 0.2$ in univariate analysis were included in multivariable modeling, which was performed using multiple logistic regression. All analyses were conducted using IBM SPSS (version 20.0, SPSS, Inc. Chicago, USA), and $P < 0.05$ was considered significant.

The proportion of transgender women was 9.85% (86/873). The age of participants ranged from 16 to 63 years (median=29, interquartile range: 25–34). In all participants, 59.22% (517/873) used social apps to

find sexual partners, and 37.46% (327/873) had regular male partners (Table 1). In the past 6 months, the proportions of participants who reported ever giving oral sex and receiving oral sex were 92.10% (804/873) and 89.92% (785/873). Most participants never used a condom when giving oral sex (89.30%, 718/804) or receiving oral sex (90.32%, 709/785). Overall, 35.26% (250/709) of the participants reported ejaculation in their partner's mouth when receiving oral sex without a condom, and 53.15% (464/873) used mouthwash before or after performing oral sex. Among the 126 participants with a detectable viral load in the past 6 months, 67.46% (85/126) reported receiving oral sex without a condom.

HIV-infected MSM with an undetectable viral load were more likely to receive oral sex in the past 6 months ($P < 0.001$), and those with a detectable viral load were on a more frequent basis ($P = 0.005$) (Table 2). A higher proportion of HIV-infected MSM with detectable viral load reported condom use when giving oral sex (19.13% *vs.* 7.96%, $P < 0.001$) and receiving oral sex (15.84% *vs.* 8.17%, $P = 0.042$) in the past 6 months compared to those with undetectable viral load. Among the 85 participants with detectable viral load who had ever received oral sex without a condom, 40.00% (34/85) reported ejaculation in their partner's mouth.

In multivariable logistic regression analysis, HIV-infected MSM who were circumcised [adjusted odds ratio (aOR)=0.6, 95% CI: 0.4–0.8] were less likely to have unprotected oral sex. HIV-infected MSM who found sexual partners via social apps (aOR=2.5, 95% CI: 1.7–3.7), used alcohol before or during sexual

TABLE 1. Basic characteristics of HIV-infected men who have sex with men in China who ever had oral sex in the past six months.

Characteristics	n (%)
Number of participants	873 (100.00)
Gender identity	
Cisgender male	787 (90.15)
Transgender women	86 (9.85)
Age (years)	
≤25	276 (31.62)
26–44	570 (65.29)
≥45	27 (3.09)
Education	
High school or below	181 (20.73)
Bachelor or college	611 (69.99)
Master or doctor	81 (9.28)

TABLE 1. (Continued)

Characteristics	n (%)
Chinese geographical division*	
North China	155 (17.75)
Northeast China	66 (7.56)
East China	256 (29.32)
Central China	114 (13.06)
South China	124 (14.20)
Southwest China	109 (12.49)
Northwest China	49 (5.61)
Marital status	
Unmarried	757 (86.71)
Married	75 (8.59)
Other	41 (4.70)
Employment status	
Full-time employment	523 (61.89)
Freelancer	167 (19.76)
Student	86 (10.18)
Unemployed	69 (8.17)
Salary (CNY)	
0–1,999	132 (15.12)
2,000–4,999	331 (37.92)
5,000–9,999	302 (34.59)
≥10,000	108 (12.37)
Sexual orientation	
Heterosexual	10 (1.15)
Homosexual	691 (79.15)
Other or not sure	172 (19.70)
Way to find sex partners	
Regular partner	327 (37.46)
Social app	517 (59.22)
Bar/party/bathhouse	40 (4.58)
Workmates	19 (2.18)
Friend recommendation	31 (3.55)
Gym	20 (2.29)
Gay community	20 (2.29)
HIV status of regular male partner	
Positive	116 (35.47)
Negative	153 (46.79)
Unknown	58 (17.74)
Time since HIV diagnosis (months)	
<12	162 (18.56)
13–35	300 (34.36)
≥36	411 (47.08)
Viral load of HIV in the last year	
Detectable (at least once)	126 (14.43)
Undetectable	613 (70.22)
Not sure	134 (15.35)

TABLE 1. (Continued)

Characteristics	n (%)
Taking HIV medications	
Yes	801 (91.75)
No	72 (8.25)
Recreational drug use before or during sexual activities	
Yes	525 (60.14)
No	348 (39.86)
Alcohol use before or during sexual activities	
Yes	316 (36.20)
No	557 (63.80)
Circumcised	
Yes	226 (25.89)
No	647 (74.11)
Type of oral sex	
Ever giving oral sex [†]	804 (92.10)
Receiving oral sex [§]	785 (89.92)
Frequency of oral sex	
≥10 times per month	55 (6.30)
4–9 times per month	106 (12.14)
1–3 times per month	296 (33.91)
<1 time per month	416 (47.65)
Number of oral sex male partners	
≥6 per month	27 (3.09)
2–5 per month	177 (20.27)
1 per month	259 (29.67)
<1 per month	410 (46.96)
Condom use when giving oral sex	
Sometimes/often	86 (10.70)
Never	718 (89.30)
Condom use when receiving oral sex	
Sometimes/often	76 (9.68)
Never	709 (90.32)
Ever ejaculated in partners' mouth when receiving oral sex without a condom	
Yes	250 (35.26)
No	459 (64.74)
Mouthwash before/after oral sex	
Yes	464 (53.15)
No	409 (46.85)

Note: Numbers may vary due to missing data.

Abbreviations: CNY=Chinese Yuan; PLAD=provincial-level administrative division; HIV=human immunodeficiency virus.

* Chinese Geographical Divisions by PLADs: North China (Beijing, Tianjin, Hebei, Shanxi, Inner Mongolia); Northeast China (Heilongjiang, Jilin, Liaoning); East China (Shanghai, Jiangsu, Zhejiang, Anhui, Jiangxi, Shandong, Fujian, Taiwan); Central China (Henan, Hubei, Hunan); South China (Guangdong, Guangxi, Hainan, Hong Kong, Macao); Southwest China [Chongqing, Sichuan, Guizhou, Yunnan, Xizang (Tibet)]; Northwest China (Shaanxi, Gansu, Qinghai, Ningxia, Xinjiang).

[†] Giving oral sex: putting your mouth on your partner's penis (Oral-Penis).

[§] Receiving oral sex: putting your penis in your partner's mouth (Penis-Oral).

TABLE 2. Characteristics of oral sex in MSM with different HIV viral loads in China.

Variables	Detectable n (%)	Undetectable n (%)	Not sure n (%)	P value
Ever giving oral sex*				0.924
Yes	115 (91.27)	565 (92.17)	124 (92.54)	
No	11 (8.73)	48 (7.83)	10 (7.46)	
Ever receiving oral sex [§]				<0.001
Yes	101 (80.16)	563 (91.84)	121 (90.30)	
No	25 (19.84)	50 (8.16)	13 (9.70)	
Frequency of oral sex				0.005
≥10 times per month	16 (12.70)	27 (4.40)	12 (8.96)	
4–9 times per month	20 (15.87)	69 (11.26)	17 (12.68)	
1–3 times per month	40 (31.75)	208 (33.93)	48 (35.82)	
<1 time per month	50 (39.68)	309 (50.41)	57 (42.54)	
Number of oral sex male partners				0.001
≥6 per month	5 (3.97)	14 (2.28)	8 (5.97)	
2–5 per month	32 (25.40)	107 (17.46)	38 (28.36)	
1 per month	43 (34.13)	187 (30.51)	29 (21.64)	
<1 per month	46 (36.50)	305 (49.75)	59 (44.03)	
Condom use when giving oral sex				<0.001
Sometimes/often	22 (19.13)	45 (7.96)	19 (15.32)	
Never	93 (80.87)	520 (92.04)	105 (84.68)	
Condom use when receiving oral sex				0.042
Sometimes/often	16 (15.84)	46 (8.17)	14 (11.57)	
Never	85 (84.16)	517 (91.83)	107 (88.43)	
Ever ejaculated in partners' mouth when receiving oral sex without a condom				0.258
Yes	34 (40.00)	173 (33.46)	43 (40.19)	
No	51 (60.00)	344 (66.54)	64 (59.81)	
Mouthwash before/after oral sex				0.050
Yes	79 (62.70)	320 (52.20)	65 (48.51)	
No	47 (37.30)	293 (47.80)	69 (51.49)	
Total	126	613	134	

Detectable: HIV viral load can be detected at least once in the past six months.

Abbreviations: MSM=men who have sex with men; HIV=human immunodeficiency virus.

*Giving oral sex: putting your mouth on your partner's penis (Oral-Penis).

§ Receiving oral sex: putting your penis in your partner's mouth (Penis-Oral).

activities (aOR=1.7, 95% CI: 1.2–2.4), and with an undetectable viral load in the past 6 months (aOR=2.1, 95% CI: 1.3–3.3) were more likely to engage in oral sex without a condom. (Table 3)

DISCUSSION

The study found a high proportion of HIV-infected MSM engaged in oral sex without a condom. Since the risk of HIV transmission through oral sex is much lower than that during anal sex, people might

mistakenly believe that unprotected oral sex is not a risky sexual behavior. Our findings showed that among the 85 participants with detectable viral loads who had ever received oral sex without a condom, 40.00% had ever ejaculated in the partner's mouth. Being exposed to semen and having sores in the mouth or on the genital may increase a person's chance of getting HIV or other STIs during oral sex, even when the infected partner has an undetectable viral load (7). The results of this study indicated that it was possible for HIV-infected MSM to transmit HIV to their sexual

TABLE 3. Factors associated with unprotected oral sex among HIV-infected MSM in China.

Characteristics	Unadjusted OR (95% CI)	P value	Adjusted OR (95% CI)	P value
Gender identity				
Cisgender male	Ref			
Transgender women	0.7 (0.4–1.1)	0.107	0.8 (0.5–1.3)	0.371
Age (year)				
≤25	Ref			
26–44	1.2 (0.9–1.7)	0.270		
≥45	1.6 (0.6–4.4)	0.353		
Education				
High school or below	Ref			
Bachelor or college	0.8 (0.6–1.3)	0.407		
Master or doctor	1.4 (0.7–2.7)	0.326		
Marital status				
Unmarried	Ref			
Married	0.8 (0.5–1.3)	0.311		
Other	1.3 (0.6–2.9)	0.508		
Have a regular partner				
Yes	0.7 (0.5–0.9)	0.040	1.1 (0.8–1.7)	0.541
No	Ref			
Find sexual partner through social apps				
Yes	2.4 (1.8–3.3)	<0.001	2.5 (1.7–3.7)	<0.001
No	Ref			
Time since HIV diagnosis				
<12 months	Ref			
13–35 months	1.0 (0.7–1.6)	0.970		
≥36 months	1.4 (0.9–2.1)	0.132		
Viral load of HIV in the last year				
Detectable	Ref			
Undetectable	2.4 (1.6–3.6)	<0.001	2.1 (1.3–3.3)	0.001
Not sure	1.8 (1.1–3.0)	0.029	1.3 (0.7–2.3)	0.384
Taking HIV medications				
Yes	Ref			
No	0.5 (0.3–1.0)	0.067	0.5 (0.3–1.1)	0.072
Recreational drug use before or during sexual activities				
Yes	Ref			
No	0.8 (0.6–1.2)	0.294		
Alcohol use before or during sexual activities				
Yes	2.2 (1.6–3.0)	<0.001	1.7 (1.2–2.4)	0.001
No	Ref			
Circumcised				
Yes	0.4 (0.3–0.6)	<0.001	0.6 (0.4–0.8)	0.002
No	Ref			

Abbreviations: OR=odds ratio; CI=confidence interval; Ref=reference; HIV=human immunodeficiency virus; MSM=men who have sex with men.

partners, who were also at the risk of STIs and infection of HIV of a different genotype. Therefore, condom use is necessary in oral sex among HIV-infected individuals, especially when they receive oral sex and ejaculate in their partner's mouth.

The findings suggested that HIV-infected MSM who found sexual partners through social apps were more likely to engage in oral sex without a condom. A previous study showed that HIV-positive MSM were more likely to engage in high-risk sexual behaviors in the context of casual sex encounters than in steady sexual relationships (8). A possible explanation is that casual partners who meet through social apps, will not be informed of the HIV status of participants during oral sex, so they are more likely to engage in oral sex without a condom due to their negligence of the risk of this sexual practice. This study supported the integration of social apps commonly used by MSM into sexual health education. In addition, the results of this study also showed that alcohol drinking before or during sexual activity was significantly related to the use of condoms in oral sex of HIV-infected MSM. People under the influence of alcohol may become disinhibited and are more likely to engage in risky sexual behaviors (9). This study emphasized the need to implement alcohol risk reduction programs in HIV-infected MSM.

A previous study showed that 85% of HIV-infected MSM reported having oral sex without a condom, which was similar to the finding of this study (5). A qualitative study among HIV-infected MSM showed that in the absence of information about whether oral sex posed a significant risk of HIV transmission, HIV-infected MSM would give up condom use during oral sex but were usually accompanied by anxiety (10).

The study was subject to at least four limitations. First, the convenience sampling might produce selection bias and might not represent the entire HIV-infected MSM in China. Second, the partner's serostatus was not mentioned in the questionnaire. Third, the cross-sectional data in this study may be subject to potential recall bias and could not establish a causal relationship. Fourth, information on STIs history was not collected, so the connection between oral sex and STIs was unable to be evaluated.

HIV-infected MSM should be informed of the potential risk of unprotected oral sex. Targeted educational strategies and interventions are needed for HIV-infected MSM to minimize the risk of unprotected oral sex. The public health sectors in China should recommend condom use during oral sex

among HIV-infected MSM, especially when in-mouth ejaculation is involved.

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