Research Article

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Journal of Preventive Medicine
ISSN 2572-5483

2016
Vol.1 No.2:6

DOI: 10.21767/2572-5483.100006

Sexual Risk Behavior and Its Change among HIV-Positive Persons after Notifying their HIV Infection Status: A Retrospective Survey

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Rec date: Dec 28, 2015 **Acc date:** March 07, 2016 **Pub date:** March 14, 2016

Abstract

Background: The number of People Living with HIV/AIDS (PLWHA) is increasing by year, and sexual transmission accounts for the main route of transmission. While there is some debate on whether notifying HIV infection status will affect PLWHAs' sexual behavior in China, this study investigates sexual risk behavior and its change among PLWHA before and after they are informed of HIV infection and provide evidence for prevention and control of AIDS.

Methods: A retrospective survey using integrated questionnaires was conducted among PLWHA, who had been notified their HIV-positive status for more than 6 months, to analyze their sexual risk behavior and the behavior change. Chi Square Test and Fisher's Exact Test were used to compare their behavior change before and after notification.

Results: 1105 PLWHA were investigated in this study, 84.2% of them have not had risky sex after notification. Among those who still had sexual risk behavior after notification, the proportions of those whose sexual frequency were more than once per week, those who have more than one sexual partner, and those who have temporary sexual partners decreased by 7.3%, 36.9%, and 48.4%, respectively. Chi-square test results revealed that the differences of proportion of sexual behavior, number of sexual partners, and type of sexual partners before and after notification were significant.

Conclusion: In total, the sexual risk behavior of PLWHA turned safer in the first 6 months after notification, which indicates that the notification and intervention of HIV infection is effective for HIV prevention.

Keywords: HIV-positive; Notification; Sexual behavior; Change

Introduction

Since the first HIV-positive case occurred in the world in 1981, the number of people living with HIV/AIDS (PLWHA) is increasing year after year. In 2013, there were 1.8 million new HIV infections (95% Confidence Interval [CI]: 1.7 million to 2.1 million), 29.2 million prevalent HIV cases (28.1 to 31.7) globally, and it causes severe disease burden [1]. So HIV infection has always been a worldwide problem. As for China, at the end of 2011, there were 780 thousand PLWHAs, 154 thousand of them were AIDS patients. During 2011, there were 48 thousand new HIV infections, and 28 thousand PLWHAs died. Among the 780 thousand PLWHAs, 63.9% of them were infected by sexual transmission. Some related researches show that although the efficiency of sexual transmission is much lower than that of sharing syringes among intravenous drug users, the population size of the former overweighs that of the latter, so the main route of HIV transmission is sexual transmission from infected individuals [2]. For a long time, the researchers focus on drug users, MSM, and commercial sex workers to prevent AIDS [3], and attention paid to PLWHAs is less relatively. However, with the development and prevalence of Antiretroviral Therapy (ART), PLWHAs are now living longer and healthier lives [4]. AIDS patients' optimism about the effectiveness of ART might loosen their minds toward sexual risk behaviour [5]. However, due to the synergistic effect [6] between Sexually Transmitted Diseases (STDs) and AIDS, people who have risky sex practices are under higher risk of suffering from STDs and AIDS. That is, HIV secondary transmission will become even more severe. So study on PLWHAs is imperative.

As is reported, drug users, MSM, and commercial sex workers are at higher risk of HIV infection because of unsafe sexual behavior or sharing syringes, such as having casual

sexual partners or having more than one sexual partners and seldom using condoms. HIV-positive status notification to the patients and related persons is important. However, because of the feeling of stigma or antipathy [7], PLWHAs may not tell their positive status to others. Then if they have sex with people, safe sexual behavior, that is, using condom is necessary. Some researches [8,9] indicated that HIV-positive people who knew their HIV-positive status would turn to safer sexual behavior, and Gary's Meta-analysis [10] found the reduction of unprotected intercourse was 53% (95% Confidence Interval [CI]: 45%–60%) in HIV-positive persons who were aware of their status comparing with HIV-positive persons who were unaware of their status in the USA. However, some other researchers showed opposite opinions [11]. There were two global researches exploring the effects of information of infection status to sexual partners, one found that there is no statistical significance, and the other showed no associations [12,13].

As for China, politics, economy, and culture are quite different from America and Africa, and there is few data about the change of HIV-positive people's sexual risk behavior nationwide. So we chose Hunan Province, Chongqing City, Yunnan Province and Shanghai City as research centers, that represent inland (Hunan, Chongqing, and Yunnan) and coastal regions (Shanghai) of China. According to estimation of AIDS epidemic in China 2011 [2], Yunnan Province had more than 50 thousand PLWHAs while the other three places had more than 10 thousand PLWHAs. And sexual transmission was the main route of HIV transmission. Thus we investigated the sexual risk behavior of PLWHAs before and after notification of the HIV-positive status, which could in turn help assessing the effect of notification and providing evidence for management and intervention for AIDS.

Subjects and Methods

Subjects

Municipal and district level of Center for Disease Control and Prevention of Changsha and Hengyang in Hunan Province, of Kunming in Yunnan Province, of Chongqing City, and of Shanghai city, as well as Changsha Infectious Disease Hospital, HIV Clinic of Hengyang Third Hospital and Hengyang Fifth Hospital in Hunan Province, were chosen as sampling sites. All the HIV-infected people who have known their HIV-positive status for more than 6 months and have been to these sites periodically to get medicines or advices from 1-10-2010 to 30-09-2013 were selected. Not using condoms every time while having sex was identified as sexual risk behavior. Informing people of HIV-positive diagnosis, and providing medical guidance and counselling was identified as notification. Informed consents were signed by all the subjects.

Data collection

Investigators who had undergone strict training interviewed subjects face to face with questionnaires. The questionnaire mainly included the socio demographic characteristics of the subjects, frequency of sex, the number of sexual partners, and the type of sexual partners before and after knowing the infection status.

Statistical Analysis

The data of every questionnaire was typed into the EpiData 3.1 by two investigators spontaneously, and then transferred to IBM SPSS Statistics 11.0 for statistical analysis. Mean and standard deviations were calculated for continuous variables, while percentages were calculated for categorical variables. Chi Square Test and Fisher's Exact Test were used to analyze Categorical variables and P value less than 0.05 was considered significant difference.

Results

1319 questionnaires were given out to qualified and cooperating subjects, 1105 questionnaires which were completed and valid were collected for analyzing, and valid return rate was 83.78%.

Sociodemographic characteristics of the subjects

Among the 1105 participants, 243(22.0%) of them came from Chongqing, 258(23.4%) came from Yunnan, 276(25.0%) came from Hunan, and 327(29.6%) came from Shanghai. There were 821 males and 275 females with the sex ratio being 2.99:1. The youngest was 19 years old and the oldest was 84 years old, and the average age of the subjects was 38.44 ± 12.38 years old. 23.3 percent of the patients were homosexual, 64.4 percent were heterosexual, and 12.3 percent of them didn't mention their sexual orientation. The detailed information is shown in Table 1.

Table 1: Social demographic characteristics of PLWHA in China, 2010-2013.

Factors	Frequency(N = 1105)α	Percentage (%)
Area		
Hunan	276	25.0
Yunnan	258	23.4
Chongqing	243	22.0

Shanghai	327	29.6
Gender		
Male	821	74.9
Female	275	25.1
Age(year)		
< 30	299	29.3
30~	314	30.7
40~	409	40.0
Nation		
Han	1039	95.7
Others	47	4.3
Native place		
City of residence	705	64.5
Other city in province of residence	125	11.4
Other province/municipality	263	24.1
Marital status		
Single	411	37.5
Married/Cohabitation	565	51.6
Divorced/Widowhood	120	10.9
Education status		
Illiteracy	32	2.9
Grade 1-9	475	43.4
Grade 10-12	272	24.8
Junior college or higher	316	28.9
Occupation		
Commercial server	320	14.8
Farmer	351	31.0
Unemployed	176	20.0
Other	164	16.2
Income		
None	246	22.5
≤ 1000yuan	152	13.9
1001~3000yuan	469	42.9
> 3000yuan	226	20.7
Sexual orientation		
Heterosexuality	706	64.4
Homosexuality	255	23.3
Bisexuality	135	12.3
α:Total number may be less than 1105 for the missing of data.		

The changes of risky sexual behavioral characteristics

There were three kinds of sexual orientations among the 1105 interviewees: heterosexuality, homosexuality and bisexuality. Considering that different sexual orientations have different characteristics of sexual behavior, so the sexual behavioral characteristics of these three kinds of patients are also reported in part. The detailed information is shown in Table 2.

Table 2: The changes of proportions of PLWHA with different risky sexual behavior characteristics before and after notifying HIV infection in different sexual orientation subgroups.

	6 months before notification N1/N2% (A)	first 6 months after notification N1/N2% (B)	χ2	P	Changes% (B-A)
Having risky sexβ					
The heterosexual	441/497(88.7)	75/397(18.9)	440.084	0.000	-69.8*
MSM	177/220(80.5)	8/99(8.1)	150.625	0.000	-73.4*
The bisexual	102/115(88.7)	6/62(9.7)	105.741	0.000	-79.0*
Totality	720/832(86.5)	89/558(15.9)	686.148	0.000	-70.6*
Frequency of sex >1 per weekγ					
The heterosexual	103/426(24.2)	7/74(9.5)	7.960	0.005	-14.7*
MSM	17/162(10.5)	2/8(25.0)	0.485	0.486	14.5
The bisexual	15/93(16.1)	2/6(33.3)	0.275	0.600	17.2
Totality	135/681(19.8)	11/88(12.5)	2.718	0.099	-7.3
Number of sexual partners >1γ					
The heterosexual	174/428(40.7)	8/75(10.7)	24.853	0.000	-30.0*
MSM	102/162(63.0)	2/8(25.0)	2.915	0.088	-38.0
The bisexual	69/95(72.6)	2/6(33.3)	2.504	0.114	-39.3
Totality	345/685(50.4)	12/89(13.5)	44.725	0.000	-36.9*
Having sex with temporary sexual partnersγ					
The heterosexual	52/137(38.0)	1/32(3.1)	14.620	0.000	-34.9*
MSM	80/120(66.7)	1/4(25.0)	/	0.120	-41.7#
The bisexual	49/68(72.1)	1/5(20.0)	/	0.032	-52.1*#
Totality	181/325(55.7)	3/41(7.3)	34.080	0.000	-48.4*

*: $P < 0.05$.

#: Calculated through Fisher's Exact Test.

β: In the term of having risky sex, N1 represent the numbers of PLWHA who have sexual risk behavior, N2 represent the numbers of PLWHA who have sexual behavior (safe or risky).

γ: N1 represent the numbers of PLWHA who have this kinds of risky sexual behavior characteristics, N2 represent the numbers of PLWHA having risky sex. The numbers in different grid is not match because some data is missing.

Having Sex

The proportions of persons who still had risky sex after notification of their HIV-positive status decreased by 70.6%, 69.8%, 73.4%, and 79.0% in total and in heterosexual, homosexual, bisexual subgroups respectively. The results of Chi-square test revealed that the differences between before and after notification were significant both in total and in other three subgroups (Table 2).

Frequency of Sex

Among those who had risky sex, the proportions of those whose sexual frequency were more than once per week decreased by 7.3%, 14.7% in total and in heterosexual subgroup respectively after notification comparing to those before notification. The results of Chi-square test revealed that the change between before and after notification was significant in heterosexual subgroup (Table 2).

Number of Sexual Partners

Among those who had risky sex, about 50% subjects had more than 1 sexual partner before notification. After notification, the proportions of subjects who had more than 1 sexual partner decreased by 36.9%, 30.0%, 38.0% and 39.3% respectively in total, heterosexual, homosexual, and bisexual subgroups. Chi-square test revealed that all the differences between before and after notification were significant both in total and in heterosexual subgroup (Table 2).

Type of sexual partners

Among those who had risky sex, the proportions of those who had temporary sexual partners decreased by 48.4%, 34.9%, 41.7%, and 52.1% respectively after notification in total, heterosexual, homosexual, and bisexual subgroups. Chi Square Test or Fisher's Exact Test revealed that the differences before and after notification were significant in total as well as in heterosexual and bisexual subgroups (Table 2).

Discussion

For a long time, HIV notification to both PLWHAs and their partners is an important component of HIV/AIDS prevention and treatment efforts [14]. Besides, under the risk of being discriminated or rejected [15], the majority of the PLWHAs themselves will turn to safer sexual behavior. So notification of HIV-positive status to the PLWHA is necessary for it's the first step to prevent the secondary transmission of HIV.

Our study found that, similar to Zhang's results [16], the total proportion of those who have risky sex after notification decreased by more than 60 percent. It means that notification will reduce the sexual risk behavior of HIV-positive people. In addition, after notification, there is remarkable reduction in the proportion of those whose sexual frequency is more than once per week, whose number of sexual partners is more than 1, and who having temporary sexual partners. That is, although some patients have sexual risk behavior, the number of sexual partners, the frequency of sex and the proportion of having temporary sexual partners decrease. The descend range in our study is larger than that of some other studies [17,18]. Besides, the proportions of number of sexual partners more than 1 and having temporary sexual partners in our study are less than both Dave's [19] and Shah's [20] studies. This may be attributed to different culture, HIV-positive patients' different levels of knowledge on AIDS, and different style of subjects, as some studies just focus on MSM.

On the other hand, 15.8% of HIV-positive people still had active risky sex after notifying their HIV-positive status. Furthermore, 13.5% of them had more than 1 sexual partner. This proportion is much lower than that in Weinhardt's study [21]. According to some studies [22,23], condom accessibility, stigma, gender, and so on, have something to do with sexual risk behavior of PLWHA. So further studies are needed to investigate the reasons for this.

We also found that, the four items of sex of the heterosexual were significantly different, while for MSM, only the item of having sexual risk behavior had significant difference before and after notification. The sexual behavioral characteristics of the bisexual were similar to the latter. On one hand, the sample sizes of the MSM and the bisexual are small, on the other hand, the sexual behavior of them does differ from those of the heterosexual. So special attention should be paid to them. Such as publicity and education, as well as provision with condoms.

Our sample size is large, and the subjects are widely distributed through our country, so the results could better reflect the sexual behavior change of PLWHA in China. However, it's a retrospective study, recall bias is inevitable. In order to get more reliable results, prospective studies are needed, and observing the change of sexual behavior on individual level is more convincing.

Conclusion

Notification to HIV-positive people which makes their sexual behavior change to safer direction shows that it is a very important measure for reducing HIV secondary transmission. At the same time, providing psychological advisory, social support as well as condoms to HIV-positive people, may be good ways to consolidate the effects of notification.

Acknowledgement

The authors would like to thank all the participating investigators for their contributions to questionnaire development and data collection. The authors would also like to thank all respondents enrolled in our study. Special thanks goes to the doctors of those hospitals for helping recruit HIV patients. Indispensable thanks goes to the China Global Fund AIDS Program to Support CBO Participation in HIV/AIDS Response 2012 (No. CSO-2012-37) and the China-Gates Foundation HIV Prevention Cooperation Program (No. 49277) for financial support.

Competing and conflicting interests

The authors report no competing and conflicting interests in this work.

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