

# Factors Influencing Temporary Sexual Behavior in Patients with Gonorrhea in STD Clinics

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**ABSTRACT-Objective:** To explore risk factors influencing temporary sexual behavior among gonorrhea patients in STD clinics, and to adapt gonorrhea prevention and control strategies accordingly.

**Methods:** From August to October 2018, gonorrhea patients in 14 STD clinics across 7 prefectures (cities) with high incidence of gonorrhea in Yunnan Province were screened and sampled to investigate potential risk factors. After pre-screening, a total of 179 gonorrhea patients were recruited (88.3% male). Multivariate logistic regression analysis model was performed to analyze the risk factors of temporary sexual behavior.

**Results:** Multivariate logistic regression analysis results revealed that 55.2% of gonorrhea patients aged  $\leq 40$  years had temporary sexual behavior, 53.1% of whom had the most recent sexual intercourse were temporary sexual partners, and 53.1% were male (OR=3.765, 95%CI=1.259~11.253,  $P=0.018$ ), single (OR=3.141, 95%CI=1.589~6.208,  $P=0.001$ ), multiple sexual partners ( $\geq 2$  persons) within the past month (OR=4.119, 95%CI=1.829~9.278,  $P=0.001$ ), which were identified as the major significant risk factors for temporary sexual behavior.

**Conclusion:** Temporary sexual behavior infection of gonorrhea patients is mainly associated with high-risk behaviors including unprotected sexual behavior and multiple sexual partners. For effective intervention and prevention, sexual education such as safe sex measurements and healthy sexual behaviors and be adopted by STD clinics and general public advocacy.

## 1. Introduction

Gonorrhea, one of the wide spread and acute sexually transmitted diseases, is mainly manifested by purulent infection of the genitourinary system. Gonorrhea is most prevalent mostly young and middle-aged males.<sup>1</sup> Previous studies have shown that sexually active individuals, males and singles are more likely to have casual sex and contract STDs.<sup>2</sup> Unprotected sex has been shown to be the main cause of gonorrhea infection,<sup>3</sup> and correct use of condoms can effectively reduce the risk of gonorrhea<sup>4</sup>. Therefore, it is valuable to study the risk factors of temporary sexual behavior of patients with gonorrhea, which can provide insights for designing targeted interventions. By conducting a cross-sectional survey on temporary high-risk sexual behaviors of gonorrhea patients in STD outpatient clinics from August to October 2018, the present study uses regression analysis to investigate the potential influencing factors of temporary heterosexual sexual behaviors in patients with gonorrhea, providing a basis for health education and behavioral intervention in STD outpatients.

## 2. Materials and Methods

### 2.1 Data Collection

In this study, a cross-sectional design was used. The top 7 prefectures (cities) in Yunnan Province (Dehong prefecture, Xishuangbanna prefecture, Qujing city, Yuxi prefecture, Honghe prefecture, Wenshan prefecture and Zhaotong prefecture) in terms of the incidence of gonorrhea were chosen, where there have been increases in the number of reported cases for three consecutive years from 2015 to 2017. In order to increase the representativeness of the sample and the feasibility of research implementation, convenience sampling was implemented to select the research participants. Cities (county, district) with the largest number of reported gonorrhea cases in 2017 in each state (city) was selected, and then the largest number of reported cases of gonorrhea in 2017 in each city (county, district) 2 STD clinics. A total of 14 STD clinics were sampled in total. Newly diagnosed gonorrhea patients over the age of 26 were pre-screened according to the "Diagnostic Criteria for Gonorrhea (WS268-2007)". A one-to-one survey was used to conduct a questionnaire survey, including socio-demographic characteristics, number of sexual partners, and condom

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use. The main content of the questionnaire is based on the "Questionnaire for STD Outpatients" in the National AIDS Sentinel Surveillance.

## 2.2 Data Analysis

EpiData 3.1 software was used to establish a sample database, and SPSS17.0 software was used for statistical analysis. The demographic information and sexual behavior characteristics of gonorrhea patients were both analyzed, and the measurement data were reported as  $(\bar{X} \pm s)$ ; the enumeration data were reported as rate (%) and composition ratio (%). The variables were analyzed by multivariate unconditional logistic regression analysis model, with an inspection level  $\alpha = 0.05$ .

## 3 Results

### 3.1 Demographic and socioeconomic characteristics of patients with gonorrhea

A total of 179 patients completed the survey, with an age range from 18 to 64 years old. There were 92.2% of patients aged  $\leq 40$  years old (165/179); 88.3% of patients were males (158/179). The education level is mostly high school/secondary school education (60/179, 33.5%). 55.3% (99/179) were single, followed by married 44.7% (80/179). 34.6% (62/179) of the participants were engaged in the service industry, followed by 22.3% (40/179) of the individual practitioners. The highest group for per capita were between 3000-4999, accounting for 29.1% (52/179)(Table 1).

### 3.2 Temporary pattern of sexual behavior in patients with gonorrhea

All of the respondents contracted gonococcus after sexual contact. Among the respondents who had the most recent sexual activity, temporary sexual partners accounted for 53.1% (95/179), and 51.5% (17/33) of the respondents used condoms during their most recent temporary sexual activities. The number of temporary sexual partners in one month accounted for 45.7% (59/129), and the number of sexual partners  $\geq 2$  accounted for 72.0% (36/50). The number of temporary sexual acts in the last month was  $\leq 2$  accounted for 58.0% (51/88), and 48.4% (44/91) of participants had temporary sexual activity more than twice in the last month. 52.3% (45/86) of the most recent casual sex were less than 1 week ago, 55.7% (34/61) 1 week ago, and 50.0% (16/32) 2 weeks ago (Table 1).

### 3.3 Univariate analysis of the influencing factors of the last temporary sexual behavior in patients with gonorrhea

Without taking into account of other factors, the correlation between the study factors and the demographic characteristics and sexual behavior characteristics of gonorrhea patients were examined independently. The list

of independent variables used for analysis included educational level, marital status, occupation and per capita annual income of family, number of sexual partners in the last month, the number of sexual acts in the last month, the time of the most recent sexual act, and whether condoms were used in the last temporary sexual. The results of univariate analysis showed statistically significant risk factors included gonorrhea patients whose most recent sexual behavior was temporary sexual behavior were unmarried ( $\chi^2=16.034$ ,  $P < 0.001$ ), and the number of sexual partners in the last month ( $\geq 2$ ) ( $\chi^2=9.980$ ,  $P=0.002$ )(Table 1).

### 3.4 Unconditional Logistic Regression Analysis on Influencing Factors of Last Temporary Sexual Behavior in Gonorrhea Patients

The variable with  $P < 0.1$  in the univariate analysis of the most recent temporary sexual behavior was selected as the independent variable, and the "nature of the most recent sexual partner" was used as the dependent variable (0=non-temporary sexual partner, 1=temporary sexual partner), according to the inclusion criteria of 0.05. Unconditional logistic regression analysis was performed at the level of exclusion criterion 0.1. Logistic regression analysis showed that gender, marital status, number of sexual partners in the last month, and the number of sexual acts in the last month were inputted into the logistic regression model. The analysis results showed that gender, marital status, the number of sexual partners in the last month, and the number of sexual acts in the last month (which suggests that the most recent sexual act was a temporary sexual act), male (OR=3.765, 95%CI=1.259~11.253,  $P=0.018$ ), single (OR=3.141, 95%CI=1.589~6.208,  $P=0.001$ ), multiple sexual partners ( $\geq 2$ ) in the last month (OR=4.119, 95%CI=1.829~9.278,  $P=0.001$ ) were risk factors for temporary sexual behavior. Male singles with multiple sexual partners ( $\geq 2$ ) in the last month are more likely to have temporary sexual behavior (Table 1).

## 4 Discussions

In this study, most of the participants were young adults who are in the sexually active years. There were 88.3% male patients, whereas there were 48.0% single patients. 68.6% of the most recent sexual behavior of singles were temporary sexual behavior. This behavior pattern can highly increase the risk of STD transmission<sup>5</sup>. The survey results found that only 51.5% of the people insisted on using condoms during their most recent temporary sex act, indicating an urgent need for sexual health education and promoting use of condoms. Safe sex education for the general public should not be promoted, especially among male singles with multiple sexual partners.

Logistic regression analysis results showed that men were more likely to have casual sex than women (OR=3.765, 95%CI=1.259~11.253,  $P=0.018$ ), this

may be due to social psychological and other factors that women have less acceptable of having casual sex than men. Further more, being single is a risk factor for casual sex(OR=3.141, 95%CI=1.589~6.208, P=0.001).The survey found that single people seeking temporary sexual partners were 68.6%, much higher than married people, and most of the single people do not have a fixed sexual partner, the relationship with a fixed sexual partner lasts short-term, or the existence of concurrent temporary partners<sup>6</sup> in the short-term. These findings further suggests that reducing risky sexual behaviors requires not only encouraging them to seek a fixed partner to provide more protective emotional need, but also learning how to maintain a long-term relationship with a fixed partner<sup>7</sup>.This study also identified that those with multiple sexual partners ( $\geq 2$ ) in the last month were more likely to have temporary sexual behavior than those with the number of sexual partners (<2) in the last month (OR=4.119, 95%. CI=1.829~9.278, P=0.001).The numbers of temporary sexual partners of those with

multiple sexual partners ( $\geq 2$ ) in the last month accounted for 72.0%.

According to these findings, improving sexually transmitted disease warning education is very important

for the prevention of gonorrhoea. Reports<sup>8</sup>indicated that multiple sex partners are an important indicator of the risk of STDs, and that condom use is lower among those with multiple sex partners<sup>9,10</sup>, suggesting that more focus should be allocated to people with multi-sex partners, among whom there is a high rate of STD infection. Research also showed that it is more difficult to insist on condom use without fixed sexual partners<sup>11</sup>.

## 5 Conclusion

In conclusion, gonorrhoea patients in STD clinics need more intensive intervention services, and the coverage of monitoring, diagnosis and treatment should continue to be expanded. Multiple efforts are required to decrease high-risk sexual behaviors in patients with gonorrhoea by promoting and intervening, and by increasing the proportion of patients whose sexual behaviors are low-risk.

## Appendix A. Supplementary data

Supplementary data to this article can be found at : Table 1

**Table 1**Demographic and sociological characteristics of patients with gonorrhoea and analysis of factors affecting the most recent temporary sexual behavior

Groups	Investigation number (n=179)	Composition ratio (%)	number of temporary partners (n=95)	Temporary partner composition ratio (%)	Univariate analysis		Unconditional Logistic Regression Analysis	
					$\chi^2$	P	OR (95% CI)	P
Age					3.661	0.056		
$\leq 40$	165	92.2	91	55.2				
$> 40$	14	7.8	4	28.6				
Gender					3.722	0.054		
Male	158	88.3	88	55.7			3.765 (1.259~11.253)	0.018
Female	21	11.7	7	33.3				
Nations					3.239	0.072		
Han nationality	148	82.7	74	50.0				
Minorities	31	17.3	21	67.7				
Education level					4.823	0.185		
Elementary school and below	35	19.6	16	45.7				
Junior high	51	28.5	23	45.1				
High School/Secondary School	60	33.5	34	56.7				
College and above	33	18.4	22	66.7				
Marital status					16.034	< 0.001		
Single	99	55.3	59	68.6			3.141 (1.589~6.208)	0.001
Married	80	44.7	31	38.8				
Occupation					7.042	0.317		
Service industries	60	34.6	32	51.6				
Individual practitioners	40	22.3	23	57.5				
farmers	33	18.4	15	45.5				
Housework and Unemployed	13	7.3	10	76.9				
Cadres and staff	11	6.2	7	63.6				

Students	5	2.8	3	60.0		
Workers and drivers	15	8.4	5	33.3		
Annual household income per capita (Yuan)					2.862	0.581
<2000	36	20.1	22	61.1		
2000~2009	42	23.4	23	54.8		
3000~4999	52	29.1	23	44.2		
5000~9999	37	20.7	21	56.8		
≥10000	12	6.7	6	50.0		
Number of sexual partners in the last month					9.980	0.002
<2	129	72.1	59	45.7		
≥2	50	27.9	36	72.0		4.119 (1.829~9.278)
Number of sex acts in the last month					1.656	0.198
≤2	88	53.6	51	58.0		
>2	91	46.4	44	48.4		
Time of last sexual activity					0.315	0.854
<one week	86	48.0	45	52.3		
one weeks ago	61	34.1	34	55.7		
two weeks ago	32	17.9	16	50.0		
Whether condoms were used during the last casual sex					0.039	0.843
Yes	33	18.4	17	51.5		
No	146	81.6	78	53.4		

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