ORIGINAL ARTICLE

Prevalence and Risk Factors of Sexual Transmitted Diseases in High-Risk Population: A Single Center Study in Thailand

Prasert Dolthammasiri MD[1], Pornnipa Harnlakorn RN[2], Wantin Sribenjalux MD[3], Atibordee Meesing MD[3]

[1] Department of Medicine, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand

[2] Nursing Section, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand

[3] Division of infectious diseases and tropical medicine, Department of Medicine, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand

Objective: Human immunodeficiency virus (HIV) pre-exposure prophylaxis (PrEP) in men who have sex with men (MSM) and transgender women (TGW) are the recent method to prevent HIV transmission but tends to increase prevalence of sexual transmitted diseases (STDs). STDs have not been reported in our center. The authors aimed to study prevalence and risk factor of STDs in MSM and TGW.

Materials and Methods: A retrospective study of 176 MSM and TGW individuals between 1st January 2012 to 30th December 2020 from test and treat clinic at Srinagarind hospital, Khon Kaen University, Khon Kaen, Thailand has been conducted. The authors collected data and medical history for demonstrating prevalence and risk factor of STDs.

Results: Of 176 patients, the mean age was 27.0±6.7 years, and 171 (97.2%) patients were MSM. Thirty-four patients (19.3%) had syphilis. The prevalence of HIV infection was 17.6%, gonococcal urethritis was 6.8%, HBV infection was 3.1%, and non-gonococcal urethritis was 1.1%. Patients who were sometimes use condom with steady partner had significant risk for HIV infection (aOR 3.62 [95% CI 1.46 to 9.00], p=0.03). History of previous STDs infection was statically significant associated with new event of syphilis infection (aOR 4.00 [95% CI 1.32 to 11.65], p=0.02) and HIV infection (aOR 4.40 [95% CI 1.93 to 9.80], p<0.001).

Conclusion: Syphilis was the most common STDs. Sometimes used condom with steady partner was a risk factor for HIV infection and history of previous STDs infection was a risk factor for syphilis and HIV infection.

Keywords: Men who have sex with men; Transgender women; STDs

J Med Assoc Thai 2023;106(Suppl.1):S60-4

Website: http://www.jmatonline.com

Men who have sex with men (MSM) and transgender women (TGW) are high risk population for sexual transmitted diseases including Human immunodeficiency virus (HIV), syphilis, gonococcal infection, non-gonococcal infection, Hepatitis B virus (HBV) infection, and Hepatitis C virus (HCV) infection[1-3]. MSM individuals with HIV infection often has higher prevalence of sexual transmitted diseases (STDs) than HIV non-infection MSM individuals[4].

The highly active antiretroviral therapy (HAART) and HIV pre-exposure prophylaxis (PrEP) are an effective method to prevention HIV transmission among people living with HIV (PLWH) and non-HIV infection individuals including MSM and TGW respectively[5-7]. The coverage of HAART and HIV PrEP led to a significant decline in the number of new HIV infections but trend to increase incidence of other STDs. These groups are at risk population for sexual transmitted diseases (STDs) because of asymptomatic infection leads to condomless sexual intercourse, has higher number of sexual partners, and higher frequencies of sexual activities[4,5,8,9].

STDs are a main problem of public health issue in Thailand. The prevalence of STDs was increasing from 6% in 2000 to 50% in 2022[10]. It has effect on social and financial problems. The effective prevention and early detection can improve health outcome from STDs[4,11,12]. The authors determined to study the prevalence and risk factor of STDs in this population.

Correspondence to:

Meesing A.

Department of Medicine, Faculty of Medicine, Khon Kaen University, Khon Kaen 40002, Thailand.

Phone: +66-43-363746, +66-43-363664

Email: atibordee@kku.ac.th

How to cite this article:

Dolthammasiri P, Harnlakorn P, Sribenjalux W, Meesing A. Prevalence and Risk Factors of Sexual Transmitted Diseases in High-Risk Population: A Single Center Study in Thailand. J Med Assoc Thai 2023;106:S60-4.

DOI: 10.35755/jmedassocthai.2023.S01.13778

Materials and Methods

Study population

The authors enrolled 176 patients with age of 18 years or older from test and treat clinic at Srinagarind hospital,

Khon Kaen University, Khon Kaen, Thailand between 1st January 2012 and 30th December 2020. The information included baseline demographics, characteristic of sexual activity, number of steady partners in the past 6 months, sexual behavior, previous of STDs and clinical of STDs were analyzed.

Laboratory testing and management

At first visit, all patients were evaluated for risk factors and clinical symptoms of STDs including syphilis, HIV, HBV, gonococcal, non-gonococcal, and HCV infection. All patients were screened for syphilis, HIV, HBV, and HCV infection by serology testing. Patients without clinical symptoms of gonococcal infection, and non-gonococcal infection were not routinely tested. The Venereal Disease Research Laboratory (VDRL) for screening and Treponema Pallidum Hemagglutination Assay (TPHA) assay as a confirmation test were used for syphilis infection. The fourth-generation enzyme-linked immunosorbent assay (ELISA) was used for HIV infection screening and confirmatory test. HIV infection and syphilis were tested at 6 months and 12 months during follow-up or if clinical indicated. Patients who had clinical symptoms of urethritis were tested by polymerase chain reaction (PCR) and/or urethral swab culture or urine culture for confirming infection of Neisseria gonorrhea, and non-gonococcal (*Chlamydia trachomatis*, *Mycoplasma pneumonia*, and *Ureaplasma urealyticum*). Hepatitis B surface (HBs) antigen, HBs antibody, and Hepatitis C antibody were used for HBV infection, and HCV infection.

Statistical analysis

There was no re-infection with the same pathogen during study period and, then the prevalence was reported in the present study as appropriated. Descriptive statistics were calculated to present the data. Categorical data were reported as percentages; continuous data were reported as means±SDs, if normally distributed and as medians with ranges if not normally distributed. Missing data for the variables of interest were negligible. The χ^2 test or Fisher exact test were used to compare categorical variables. Bivariate correlation analyses were performed using Pearson or Spearman tests for nonparametric variables. The 2-tailed statistical significance level was $p<0.05$. Associations were expressed as hazard risk (HR) or odd ratio (OR) and 95% confidence interval (95% CI). Multinomial logistic regression test for nonparametric variables. All analyses were performed with SPSS version 23 (NY, USA).

Results

There was a total of 176 patients included in the present study, 171 patients were MSM (97.2%), and 5 patients were TGW (2.8%). The mean age was 27.0±6.7 years. The education of population was bachelor's degree (47.2%), less than bachelor's degree (39.2%), and more than bachelor's degree (4.5%). Fifty-four (30.7%) of MSM and TGW individuals had partner of 2 to 5 persons in the past 6 months. Seventy (39.8%) patients had always use condom with steady partner and 107 (60.8%) patients had always use condom with casual partner. The baseline demographic and clinical characteristics of the cohort were listed in Table 1.

Prevalence of sexual transmitted diseases

Of 176 patients, 170 patients had syphilis serology tested and 34 patients (19.3%) had syphilis. The prevalence of HIV infection was 17.6%, gonococcal urethritis was 6.8%, HBV infection was 3.1%, and non-gonococcal urethritis was 1.1%. There was no HCV infection during study period. The prevalence of STDs was listed in Table 2.

Risk factors for sexual transmitted diseases acquisition

Patients who had condomless intercourse sometimes with the steady partner had significant higher risk for HIV infection than those who were always used condom (OR 1.18 [95% CI 1.02 to 1.34], p=0.03). After performing logistic regression analysis, Patients who had condomless intercourse sometimes with the steady partner remained independent factors for higher risk for HIV infection compared to those who always used condom (adjusted OR 3.62 [95% CI 1.46 to 9.00], p=0.03).

Patients who have history of previous STDs infection was statically significant associated with new syphilis infection (OR 3.91 [95% CI 1.31 to 11.63] p=0.02) and HIV infection (OR 4.35 [95% CI 1.94 to 9.77], p<0.001) and both factors remained significant risk factors in multivariate analysis (adjusted OR 4.00 [95% CI 1.32 to 11.65], p=0.02 and adjusted OR 4.40 [95% CI 1.93 to 9.80], p<0.001). The risk factors for STDs were listed in Table 3 and Table 4.

Discussion

The oral HIV PrEP with tenofovir disoproxil fumarate and emtricitabine is a recent strategy for prevent HIV transmission but tend to decreased of condom use with partners[13,14]. The important factors for STDs prevention and effective tools for STDs prevention are in cooperate of health education, health promotion campaign, condom use, screening STDs, social media program, and simple access to health care system[15,16].

From previous study, gonococcal infection is the most common prevalence in STDs among the high-risk group and general population[14]. On the other hand, in our study showed syphilis infection was the highest prevalence among STDs in the high-risk group population because

syphilis serology testing is a routinely screening. The lower prevalence of gonococcal infection and non-gonococcal infection in our study than previous report because we used clinical driven for investigating only in symptomatic patients. Intensive screening in asymptomatic individuals for STDs especially gonococcal infection and non-gonococcal infection should perform for successful prevention and more

Table 1. Baseline characteristics

Demographic data	Patients (n=176)
Gender (%)	
MSM	171 (97.2)
TGW	5 (2.8)
Age (years ± SD)	27.0±6.7
Education (%)	
Less than bachelor's degree	69 (39.2)
Bachelor's degree	83 (47.2)
More than bachelor's degree	8 (4.5)
Unknown	16 (9.1)
Occupation (%)	
Employed	114 (64.8)
Unemployed	2 (1.1)
Student	58 (33)
High school	1 (0.6)
University	57 (32.4)
Unknown	2 (1.1)
Number of male partners in 6 months (persons) (%)	
0 to 1	38 (21.6)
2 to 5	54 (30.7)
>5	42 (23.9)
Unknown	42 (23.9)
Condom used with partners in the past 6 months (%)	
Steady partners	
Always	70 (39.8)
Sometimes	102 (58)
Unknown	4 (2.3)
Casual partners	
Always	107 (60.8)
Sometimes	65 (36.9)
Unknown	4 (2.3)
History of previous STDs (times) (%)	
0	129 (73.3)
1	38 (21.6)
2	9 (5.1)
Detail of previous STDs (%)	n=46
Syphilis	19 (41.3)
Gonococcal urethritis	8 (17.3)
Non-gonococcal urethritis	1 (2.1)
HBV infection	5 (10.8)
HCV infection	0
HIV infection	13 (28.2)

HBV=Hepatitis B virus; HCV=Hepatitis C virus; HIV=Human immunodeficiency virus; MSM=men who have sex with men; TGW=transgender women; STDs=Sexual transmitted diseases

Table 2. Prevalence of sexual transmitted diseases

Diseases	Patients (%)
Syphilis (n=170)	34 (19.3)
Gonococcal urethritis (n=176)	12 (6.8)
Non-gonococcal urethritis (n=176)	2 (1.1)
HIV infection (n=176)	31 (17.6)
HBV infection (n=158)	5 (3.2)
HCV infection (n=153)	0

HIV=Human immunodeficiency virus; HBV=Hepatitis B virus; HCV=Hepatitis C virus

Table 3. Risk factors of sexual transmitted diseases by univariate analysis

Factors	Odd ratio	95% CI	p-value
Penile-anal sexual activity			
Syphilis	1.18	0.31 to 4.47	0.80
Gonococcal urethritis	1.00	1.00 to 1.05	1.00
Non-gonococcal urethritis	1.00	1.00 to 1.08	1.00
HIV infection	1.34	0.52 to 3.40	0.53
HBV infection	1.40	0.12 to 16.08	0.78
Number of partners (increased/ 1 person)			
Syphilis	0.50	0.08 to 2.89	0.44
Gonococcal urethritis	1.00	1.00 to 1.00	0.99
Non-gonococcal urethritis	1.00	1.00 to 1.00	0.65
HIV infection	0.38	0.09 to 1.60	0.19
HBV infection	0.34	0.03 to 3.40	0.36
Condom (sometimes used with steady partner)			
Syphilis	0.31	0.08 to 1.16	0.09
Gonococcal urethritis	0.33	0.01 to 11.94	1.00
Non-gonococcal urethritis	1.00	1.00 to 1.00	0.99
HIV infection	1.18	1.02 to 1.34	0.03
HBV infection	0.64	0.06 to 7.20	1.00
Condom (sometimes used with casual partner)			
Syphilis	0.66	0.23 to 1.90	0.58
Gonococcal urethritis	1.67	0.82 to 3.41	1.00
Non-gonococcal urethritis	1.25	0.81 to 1.94	1.00
HIV infection	0.76	0.34 to 1.68	0.54
HBV infection	1.08	0.10 to 12.20	1.00
History of previous STDs			
Syphilis	3.91	1.31 to 11.63	0.02
Gonococcal urethritis	1.67	0.82 to 3.41	1.00
Non-gonococcal urethritis	1.30	0.81 to 2.00	1.00
HIV infection	4.35	1.94 to 9.77	<0.001
HBV infection	1.65	0.27 to 10.23	0.63

CI=confident interval; HIV=Human immunodeficiency virus; HBV=Hepatitis B virus; STDs=sexual transmitted diseases

Table 4. Risk factors of sexual transmitted diseases by multivariate analysis

Factors	Adjusted odd ratio	95% CI	p-value
Condom (sometimes used with steady partner)			
HIV infection	3.62	1.46 to 9.00	0.03
History of previous STDs			
Syphilis	4.00	1.32 to 11.65	0.02
HIV infection	4.40	1.93 to 9.80	<0.001

CI=confident interval; HIV=Human immunodeficiency virus; STDs=sexual transmitted diseases

precise prevalence of these diseases.

This retrospective study had several limitations. First, lack of medical records data, and sexual behavior due to retrospective fashion. Second, the present study was not including major risk factor such as alcohol consumption or drug use in sexual activity, group sexual activity and social media related sexual activity. Third, our study was not tested various STDs in asymptomatic patients and routinely screening test only for syphilis, HIV and HBV infection. The diagnosis was clinically confirmed by limited investigations wherever indicated. In spite of this, the study highlights the profile of STDs among MSM and TGW individuals.

Conclusion

Syphilis was the most common STDs among MSM and TGW individuals in our center. The behavior of MSM ang TGW individuals who sometimes used condom with steady partner was a risk factor for HIV infection and MSM and TGW individuals who had history of previous STDs infection was a risk factor for syphilis and HIV infection.

What is already known on this topic?

Men who have sex with men (MSM) and transgender women (TGW) are high risk population for sexual transmitted diseases. HIV PrEP prevent new HIV infection individuals but trend to increase incidence of other STDs.

What this study adds?

Syphilis was the most common STDs among this group especially in condomless intercourse.

Acknowledgements

The authors thank (a) the Department of Medicine, Faculty of Medicine, Khon Kaen University for publication support,

Ethics approval

The present study was approved by the Human Research Ethics Committee of Khon Kaen University reviewed and approved the study per the Helsinki Declaration and the Good Clinical Practice Guidelines (HE631125).

Funding disclosure

The study received funding support from the Faculty of Medicine, Khon Kaen University, Thailand.

Conflict of interests

The authors declare no conflict of interests.

References

1. Yeung H, Luk KM, Chen SC, Ginsberg BA, Katz KA. Dermatologic care for lesbian, gay, bisexual, and transgender persons: Epidemiology, screening, and disease prevention. J Am Acad Dermatol 2019;80:591-602.
2. Wansom T, Pinyakorn S, Kolsteeg CJ, Kroon E, Sacdalan CP, Chomchey N, et al. Brief report: Group sex and methamphetamine use fuel an explosive epidemic of hepatitis C among HIV-infected men who have sex with men in Bangkok, Thailand. J Acquir Immune Defic Syndr 2020;84:331-5.
3. Centers for Disease Control and Prevention (CDC). HIV prevalence among populations of men who have sex with men--Thailand, 2003 and 2005. MMWR Morb Mortal Wkly Rep 2006;55:844-8.
4. Thienkrua W, van Griensven F, Mock PA, Dunne EF, Raengsakulrach B, Wimonsate W, et al. Young men who have sex with men at high risk for HIV, Bangkok MSM cohort study, Thailand 2006-2014. AIDS Behav 2018;22:2137-46.
5. Jansen K, Steffen G, Potthoff A, Schuppe AK, Beer D, Jessen H, et al. STI in times of PrEP: high prevalence of chlamydia, gonorrhea, and mycoplasma at different anatomic sites in men who have sex with men in Germany. BMC Infect Dis 2020;20:110.
6. Montaño MA, Dombrowski JC, Dasgupta S, Golden MR, Duerr A, Manhart LE, et al. Changes in sexual behavior and STI diagnoses among MSM initiating PrEP in a clinic setting. AIDS Behav 2019;23:548-55.
7. Cheung KT, Fairley CK, Read TR, Denham I, Fehler G, Bradshaw CS, et al. HIV incidence and predictors of incident HIV among men who have sex with men attending a sexual health clinic in Melbourne, Australia. PLoS One 2016;11:e0156160.
8. Chemnasiri T, Beane CR, Varangrat A, Chaikummao S, Chitwarakorn A, Van Griensven F, et al. Risk behaviors among young men who have sex with men in Bangkok: A qualitative study to understand and contextualize high HIV incidence. J Homosex 2019;66:533-48.
9. Budkaew J, Chumworathayi B, Pientong C, Ekalaksananan T. Prevalence and factors associated with gonorrhea infection with respect to anatomic distributions among men who have sex with men. PLoS One 2019;14:e0211682.
10. Chaiyabutr C, Nanchaipruek Y, Pochanapan O, Leeyaphan C, Jiamton S. Characteristics of HIV/sexually transmitted infections among men who have sex with men and women in Bangkok, Thailand. Int J STD AIDS 2022;33:963-9.

11. Hiransuthikul A, Pattanachaiwit S, Teeratakulpisarn N, Chamnan P, Pathipvanich P, Thongpaen S, et al. High subsequent and recurrent sexually transmitted infection prevalence among newly diagnosed HIV-positive Thai men who have sex with men and transgender women in the test and treat cohort. Int J STD AIDS 2019;30:140-6.
12. Pattanasin S, Cadwell BL, Smith DK, Sukwicha W, Mock PA, Wimonsate W, et al. Estimating the impact of HIV combination prevention in men who have sex with men, the Bangkok MSM cohort study, Thailand. Int J STD AIDS 2020;31:637-41.
13. Traeger MW, Schroeder SE, Wright EJ, Hellard ME, Cornelisse VJ, Doyle JS, et al. Effects of pre-exposure prophylaxis for the prevention of human immunodeficiency virus infection on sexual risk behavior in men who have sex with men: A systematic review and meta-analysis. Clin Infect Dis 2018;67:676-86.
14. Prescott MR, Hern J, Petersen M, Santos GM. Does HIV pre-exposure prophylaxis modify the effect of partnership characteristics on condom use? A cross-sectional study of sexual partnerships among men who have sex with men in San Francisco, California. AIDS Patient Care STDS 2019;33:167-74.
15. Cuffe KM, Esie P, Leichliter JS, Gift TL. HIV services provided by STD programs in state and local health departments - United States, 2013-2014. MMWR Morb Mortal Wkly Rep 2017;66:355-8.
16. Sznitman S, Stanton BF, Vanable PA, Carey MP, Valois RF, Brown LK, et al. Long term effects of community-based STI screening and mass media HIV prevention messages on sexual risk behaviors of African American adolescents. AIDS Behav 2011;15:1755-63.