Factors Affecting Continuous Follow-up Treatments among Patients Infected with Syphilis at Phramongkutklao Hospital

Weranat Sookboon, M.D.[1], Supapat Laodheerasiri, M.D.[1]
[1]Division of Dermatology, Department of Medicine, Phramongkutklao Hospital, Bangkok 10400, Thailand
Received 28 June 2023 • Revised 16 July 2023 • Accepted 31 July 2023 • Published online 1 September 2023

Abstract:

Background: In Thailand, there is an increasing rate of syphilis infection and a recent study found that a significant factor of treatment failure and re-infection was due to a loss of follow-up. Therefore, continuous follow-up is crucial for a successful treatment and to control the disease.

Objective: To study factors affecting continuous follow-up treatments among patients infected with syphilis at Phramongkutklao Hospital.

Materials and Method: This is a retrospective cohort study of 111 patients diagnosed with syphilis at Phramongkutklao Hospital from 1 January 2012 – 30 April 2022. The results of demographic data, clinical presentations, serology (VDRL, TPHA), sexual behaviour, treatments and follow-up plans are included.

Results: From the study, factors significantly affecting continuous follow-up treatments included occupations, domiciles, and presenting conditions. Regarding the domicile factor, patients in the Central part were ten times more likely to continue the follow-up treatments than those in the Southern region (P = 0.045). In comparison to patients who got health check-up or donated blood, patients who firstly diagnosed during antenatal care and those with the presence of neurological symptoms were seven times (P = 0.004) and ten times (P = 0.048) more likely to have continuous follow-up, respectively. In addition, the frequency of patients with other occupations was three times more than soldiers and polices (P = 0.018). Interestingly, among patients who continued their follow-up treatments, most medical professionals failed to complete syphilis treatment follow-up guideline.

Conclusion: From this study, potential factors affecting continuous follow-up treatments among patients infected with syphilis included occupation, presenting clinical symptoms, and domiciles. Therefore, these factors should be taken into consideration for the treatment and follow-up plans for patients infected with syphilis.

Keywords: Syphilis, Continuous follow-up

Corresponding author: Supapat Laodheerasiri, M.D.
Division of Dermatology, Department of Medicine, Phramongkutklao Army Hospital and College of Medicine, Bangkok 10400, Thailand
E-mail: nenskin@gmail.com
GMSMJ 2023; 3 (3): 151-157

Introduction

Syphilis is one of the sexual transmission diseases caused by *Treponema pallidum*. There are four stages of syphilis infection including primary, secondary, latent (early and late), and tertiary. Due to different symptoms in each stage, specific treatments, follow-up time, and serological workup are also different. Therefore, continuous and complete serological follow-up is mandatory for accessing treatment outcomes and preventing the spread of infection.[1,2] In order to ensure cure and detect treatment failure or reinfection, treated syphilis patients must be significantly followed up after treatment. This is done by evaluating the clinical and serological response to treatment.

In Thailand, there is an increasing rate of syphilis infection.[3,4] The incidence rate of syphilis in Thailand increases from 2.16 cases per 100,000 person-years in 2010 to 11.51 cases per 100,000 person-years in 2020.[3] A recent study found that significant factor of treatment failure and re-infection was due to a loss to follow-up.[5,6] Therefore, continuous follow-up is crucial for the successful treatment and control of syphilis.

Materials and Method

Study design

We conducted a retrospective cohort study from January 2012 to April 2022 including 111 patients who were diagnosed with all stages of syphilis from both inpatient department and outpatient department at Phramongkutklao hospital.

Inclusion and exclusion criteria

The inclusion criteria were the patients with over the age of 12 years old and the patients who were diagnosed with any stage of syphilis. We excluded the patients who were misdiagnosed. This study was approved by the Research Ethic Committee of Phramongkutklao College of Medicine.

Definition and data collection

Continuous follow-up was defined as the patients who came for every follow-up visit for clinical or serological evaluation according to doctor's appointment.

Complete follow-up was defined as the patient who came to follow-up visits following syphilis treatment guideline (table1).

Table 1 Center for Disease Control and Prevention Recommendations for Follow-up of Adult with Primary, Secondary, Early Latent, or Late Latent Syphilis[7-10]

Stage of disease	HIV status	Schedule for follow-up after treatment
Primary or secondary	HIV-uninfected	6 and 12 months
	HIV-infected	3, 6, 9, 12, and 24 months
Early latent	HIV-uninfected	6, 12, and 24 months
	HIV-infected	6, 12, 18, and 24 months
Late latent or latent of unknown duration	HIV-uninfected	6, 12, and 24 months
	HIV-infected	6, 12, 18, and 24 months

Primary and secondary outcome

The primary outcome was the factor affecting continuous follow-up treatment among patients infected with syphilis and secondary outcome was the rate of continuous follow-up.

Statistical analysis

The demographic data were presented as number, mean and percentage. We compared the factors affecting continuous follow-up in patient infected with syphilis using Fisher's exact test, Chi-square test and logistic regression. *P*-value ≤ 0.05 was considered statistically significant.

Results

Overall, 111 patients diagnosed with syphilis at any stage were enrolled in the study. The number of female patients were slightly more than male. Most patients had never been infected or received any treatments. No any previously treated patient had followed up according to the syphilis guideline. The demographic data is shown in Table 2.

Table 2 Demographic data

Characteristics	Number of patients
Number of patients	111
Sex% (Male: Female)	45 : 55
Re-infection % (Yes: No)	5.4 : 94.6
Complete treatment % (Yes: No)	95.5 : 4.5
Continuous follow-up (Yes: No)	83 : 28
Complete follow-up	0

The most common age range of the patients was 20-29 years old, and the most common stages of the syphilis infection were late latent and secondary. Human immunodeficiency virus (HIV) was the most common co-infection among patients infected with syphilis. Homosexuality was a common sexual behavior in this study.

Most occupations of the patients were police and soldier. As in table 3, our study revealed that occupation significantly affected continuous follow-up in patients infected with syphilis (P=0.018). The number of patients with other occupations were three times more than soldiers or polices (P = 0.018). The common domicile of the patients was in the central region, and domicile was also a significant factor affecting continuous follow-up in patients infected with syphilis (P=0.033). Regarding the domicile factor, patients in the Central region were ten times more likely to continue the follow-up treatment than those in Southern region (P = 0.045).

The most common abnormal serological report was from antenatal care work up, skin manifestations, health check-up, and blood donation. These factors also affected continuous follow-up of the treatments among patients infected with syphilis (P = 0.002). Compared to those with health check-up or blood donation, patients diagnosed during antenatal care were seven times more likely to have continuous follow-up (P = 0.004). With neurological symptoms, patients infected with syphilis were ten times more likely to visit for continuous follow-up (P = 0.048).

Table 3 Factors affect continuous follow-up in patients infected with syphilis

Characteristics	Non-continuous F/U	Continuous F/U	P-value
Age			
Less than 20 years	6	11	0.39
20 – 29 years	15	39	
30 – 39 years	5	17	
More than 40 years	2	16	
Gender			
Male	17	22	0.088
Female	11	50	
Occupations			
Soldiers/Polices	11	14	0.018
Governments	1	2	
Business owner	2	6	
Employee	2	17	
Student	5	5	
Unknown	7	39	
Domiciles			
Central	17	61	0.033
Northeast	5	7	
Southern	3	1	
Eastern	2	2	
Presenting conditions			
Skin	9	9	0.002
Antenatal care	6	41	
Other STDs*	4	8	
Neurological symptom	1	10	
Check-up / blood donation	8	8	
Complete medication			
Incomplete	1	2	0.562
Complete	25	81	
Co-infection with HIV			
Yes	5	20	0.673
No	23	63	

*STDs, Sexually Transmitted Diseases

Logistic regression predicting continuous follow-up: Comparing between non soldiers or polices and soldiers or polices: between other regions and southern region: between other presenting conditions and health check-up or blood donation was shown in table 4, 5 and 6 respectively.

Table 4 Logistic regression predicting continuous follow-up: Comparing between non soldiers or polices and soldiers or polices

OR (95%CI)	P (Wald 's test)	P (LR-test)
3.19 (1.23,8.23)	0.017	0.018

Table 5 Logistic regression predicting continuous follow-up: Comparing between other regions and southern region

Region	OR (95%CI)	P (Wald 's test)
Central	10.76 (1.05, 110.21)	0.045
Northeast	4.2 (0.33, 53.12)	0.268
Eastern	3 (0.15, 59.89)	0.472

Table 6 Logistic regression predicting continuous follow-up: Comparing between other presenting conditions and health check-up or blood donation

Presenting condition	OR (95%CI)	P (Wald 's test)
Antenatal care	6.83 (1.86, 25.12)	0.004
STD*	2 (0.42, 9.42)	0.381
Neurological symptoms	10 (1.03, 97.5)	0.048
Skin manifestation	1 (0.2601, 3.8453)	1

*STDs, Sexually Transmitted Diseases

Discussion

Previous studies had revealed that the follow-up loss in patients infected with syphilis increased the incidence of treatment failure and re-infection.[5] Therefore, lost follow-up was an essential factor in the treatment outcomes and control of syphilis infection. However, there have been no previous studies on factors affecting continuous follow-up in patients infected with syphilis. In this study of 111 patients infected with syphilis, significant factors affecting continuous follow-up were occupations, domiciles, and presenting conditions. Possible explanations of soldiers and polices who are more likely to lose follow-up are their occupations, which might be related to their missions or duties. In addition, patients from the Central region who visited for continuous follow-up more

than those from Southern region are likely due to the location of Phramongkutklao Hospital, which is more convenient to them.

Presenting conditions were also a significant factor affecting continuous follow-up. Patients who were diagnosed with syphilis during ANC or had neurological symptoms were more likely to visit for continuous follow-up treatments than those diagnosed during health check-ups or blood donation. Those patients diagnosed during ANC might have more concern about the health effects of syphilis infection on their babies. Patients with neurological symptoms also had concurrent physical abnormalities which required continuous intensive medical care. Therefore, the patients who were aware of their health conditions, consequently, were likely to follow the medical recommendation including the clinical monitoring.

Interestingly, none of the patients visited for complete follow-up treatment according to the syphilis guideline, partly due to the improvement of their symptoms and no appointment from the doctor after non-reactive of nontreponemal test were shown. Therefore, health education and awareness were crucial for patients infected with syphilis to visit for continuous follow-up and completed follow-up. The encouragement for complete follow-up according to the syphilis guideline to the doctor was important, although the clinical and serological examinations were normal.

Finally, we suggest that establishment of a sexually transmitted disease clinic and generation of a syphilis information sheet may encourage patients infected with syphilis to visit for continuous follow-up and complete follow-up for controlling of syphilis.[11-15]

Limitations of our study included the small sample size and retrospective study design with some incomplete medical records.

Conclusion

Our study showed significant factors affecting continuous follow-up in patients infected with syphilis comprised domicile, occupation, and presenting conditions including during antenatal care, suffering from neurological symptoms. Therefore, these factors should be taken into consideration for the treatment and follow-up plan for patients infected with syphilis.

References

1. Marcus JL, Katz KA, Bernstein KT, Nieri G, Philip SS. Syphilis testing behavior following diagnosis with early syphilis among men who have sex with men-San Francisco, 2005-2008. Sex Transm Dis. 2011; 38 (1): 24–9.
2. Phipps W, Kent CK, Kohn R, Klausner JD. Risk factors for repeat syphilis in men who have sex with men, San Francisco. Sex Transm Dis. 2009; 36 (6): 331–5.
3. Data from Bureau of Epidemiology, Department of Disease Control. Ministry of Public Health, Thailand on 17 June 2019.
4. Kitayama K, Segura ER, Lake JE, Perez-Brumer AG, Oldenburg CE, Myers BA, et al. Syphilis in the Americas: a protocol for a systematic review of syphilis prevalence and incidence in four high-risk groups, 1980-2016. Syst Rev. 2017 Oct 10;6 (1):195. doi: 10.1186/s13643-017-0595-3.
5. Luo Z, Zhu L, Ding Y, Yuan J, Li W, Wu Q, et al. Factors associated with syphilis treatment failure and reinfection: a longitudinal cohort study in Shenzhen, China. BMC Infect Dis. 2017;17 (1): 620. doi: 10.1186/s12879-017-2715-z.
6. Tang W, Huan X, Zhang Y, Mahapatra T, Li J, Liu X, et al. Factors associated with loss-to-follow-up during behavioral interventions and HIV testing cohort

among men who have sex with men in Nanjing, China. PLoS One. 2015; 10 (1): e115691.
7. Tuddenham SA, Zenilman JM. Syphilis. In: Kang S, editor. Fitzpatrick's dermatology, 9th ed, 2-volume set. McGraw-Hill Education/Medical. 2018: 2636-2663.
8. Stary G, Stary A. Sexually Transmitted infections. In: Bolognia JL, Schaffer JV, Cerroni L. editor(s). Dermatology: 2-Volume Set. 4th ed. London, England: Elsevier Health Sciences. 2017: 1805-1825.
9. Kinghorn GR, Omer R. Syphilis and Congenital Syphilis. In: Griffiths C, Barker J, Bleiker T, Chalmers R, Creamer D, editors. Rook's textbook of dermatology. 9th ed. Hoboken, NJ: Wiley-Blackwell. 2016: 29.3-29.34.
10. Forrestel AK, Kovarik CL, Katz KA. Sexually acquired syphilis: Laboratory diagnosis, management, and prevention. J Am Acad Dermatol. 2020; 82 (1): 17–28.
11. Hart TA, Noor SW, Skakoon-Sparling S, Lazkani SN, Gardner S, Leahy B, et al. GPS: A randomized controlled trial of sexual health counseling for gay and bisexual men living with HIV. Behav Ther. 2021; 52 (1): 1–14.
12. Mehta SD, Erbelding EJ, Zenilman JM, Rompalo AM. Gonorrhoea reinfection in heterosexual STD clinic attendees: longitudinal analysis of risks for first reinfection. Sex Transm Infect. 2003; 79 (2): 124–8.
13. Coates TJ, Richter L, Caceres C. Behavioral strategies to reduce HIV transmission: how to make them work better. Lancet. 2008; 372 (9639): 669–84.
14. Hughes G, Brady AR, Catchpole MA, Fenton KA, Rogers PA, Kinghorn GR, et al. Characteristics of those who repeatedly acquire sexually transmitted infections: a retrospective cohort study of attendees at three urban sexually transmitted disease clinics in England. Sex Transm Dis. 2001; 28 (7): 379–86.
15. Klausner JD, Levine DK, Kent CK. Internet-based site-specific interventions for syphilis prevention among gay and bisexual men. AIDS Care. 2004; 16 (8): 964–70.