Factors associated with patient delay among tuberculosis patients in border hospitals, Chiang Rai province, Thailand

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Abstract

Purpose – The purpose of this paper is to determine the factors associated with patient delay among tuberculosis patients in border hospitals, Chiang Rai province, Thailand.

Design/methodology/approach – A cross-sectional study was conducted in the four biggest border hospitals in Chiang Rai province, Thailand during May to July 2018 among 103 identified TB cases. Data were collected by a face-to-face interview with structured questionnaire on patients' general characteristics, HIV status and patient delay status. Descriptive statistics were used to analyze the patients' general characteristics, HIV and patient delay status. The association among variables and patient delay was analyzed by χ^2-test. The variables with p-value < 0.20 obtained in bivariate analysis were further analyzed by binary logistic regression and considered significant with p-value < 0.05.

Findings – All patients enrolled, most were reported with patient delay (65.0 percent). Bivariate analysis demonstrated that level of education, nationality and HIV status were associated factors for patient delay. Among these factors, binary logistic regression revealed that HIV negative TB patients were increased 6.806-fold odds of being patient delay (OR = 6.806; 95% CI: 1.174–39.462), while non-Thai TB patients were also increased 2.824-fold odds of being patient delay (OR = 2.824; 95% CI: 1.041–7.660).

Originality/value – Patient delay among TB patients in Chiang Rai province was high. This study further supports the requirement on promoting of TB knowledge and awareness emphasized on non-Thai population and general public along the border areas of Chiang Rai province.

Keywords Tuberculosis, Border hospital, Patient delay, Thailand

Paper type Short report

Introduction

Tuberculosis (TB) is one of the oldest known diseases. It is a highly contagious respiratory infectious disease which can spread via droplets and the secretions of an infected person. This disease is caused by a bacterial microorganism called *Mycobacterium tuberculosis*[1]. TB is one of the most common diseases in immunocompromised individuals such as HIV/AIDS patients. The treatment of TB involves a course of antibiotics that lasts for six months. It is important to complete the entire treatment to prevent treatment failure which can cause the development of antibiotic-resistant TB[2]. Patient delay is the period between the first onset of symptoms and the patient's presentation to a health facility[3, 4]. Patient delay in TB treatment can increase the risk of spreading the disease to others, especially those in the risk group categories such as immunocompromised individuals[5–9].

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One of the high prevalence areas for TB is the cross-border area, since populations living near or around the cross-border are constantly moving, which results in missing and incomplete treatment, leading to the persistence of TB infections[4, 8]. Thailand has been listed as one of the highest TB burdened countries in the world. In 2016, Thailand had approximately 120,000 new cases of TB patients with the incidence rate equal to 172 per 100,000 populations[3, 9]. Nevertheless, only 67,193 cases were reported and received treatment, while more than 40 percent of those identified TB cases were missing necessary treatment[2]. Chiang Rai province is adjacent to Myanmar and Laos, which have continuous movements of cross-border populations. Consequently, Chiang Rai province has a problem with monitoring and screening TB patients. To the best of our knowledge, there is still a lack of knowledge on patient delay among TB patients in Chiang Rai province around the border areas adjacent to Myanmar and Laos.

Therefore, the aim of this study was to find the factors associated with patient delay among TB patients in border hospitals in Chiang Rai province, as well as to understand the pattern of delay in health-seeking behaviors among TB patients in border hospitals in Chiang Rai province, Thailand. The information from this study could help facilitate the improvement of health care services and treatment for TB patients in Chiang Rai province.

Methods

Study area and study population

A cross-sectional study was conducted to determine the factors associated with patient delay among TB patients in the four biggest border hospitals. These were Chiang Sean hospital, Mae Sai hospital, Wiang Kean hospital and Chiang Khong hospital. The study period was from May to July 2018. This study consisted of 103 identified TB patients who were admitted to the above-mentioned hospitals, were 18 years old and above, agreed to participate in the study and did not have hearing or vocal impairments. The participants in this study were purposively selected from the studied hospitals. The sample size of the study population was calculated using the formulation from Krejcie and Morgan[10] and taken from the number of TB patients in the four border hospitals. In total, 10 percent was added to the original sample size to offset any missing data.

Data collection

A face-to-face interview with a structured questionnaire was used for data collection and was conducted by trained interviewers. The first part of the questionnaire included patients' general characteristics pertaining to gender, age group, nationality, marital status, level of education, financial status and paid employment. The second part of the questionnaire included questions on HIV status (Yes or No); patient delay status was marked as either "Yes" (there was a delay) as patients received treatment in the hospital after 30 days from the onset of symptoms; or "No" (there was no delay) for patients who received treatment within 1–30 days of the onset of symptoms. The questionnaire was validated by three experts and pilot tested on 30 TB patients in a nearby hospital in Chiang Rai province to ensure the reliability of the questions. Cronbach's α was 0.720.

Statistical analysis

Statistical analyses were performed using the statistical program Statistical Package for Social Sciences (SPSS version 22, University license). Descriptive statistics were used to analyze the patients' general characteristics, HIV status and patient delay status. Frequency and percentage were used to report the categorical variable, while mean $\pm$ standard deviation (SD) to report the continuous variable (Tables I and II). χ^2 and Fisher's exact tests were used to test the association of categorical data. Variables with p-value < 0.2 were entered into a binary logistic regression model. The unadjusted model was fit to estimate the

General characteristics	Frequency (*n*)	%
Gender		
Male	67	65.0
Female	36	35.0
Age group (years)		
⩽20	1	1.0
21–30	11	10.7
31–40	19	18.4
41–50	20	19.4
51–60	24	23.3
> 60	28	27.2
Mean ± SD		
50.67 ± 15.98 years		
Nationality		
Thailand	63	61.2
Ethnic minority	33	32.0
Myanmar	7	6.8
Marital status		
Married	24	23.3
Single	63	61.2
Divorced	4	3.9
Widowed	12	11.7
Level of education		
No formal education	50	48.5
Primary school	34	33.0
High school	13	12.6
Diploma	3	2.9
College	3	2.9
Financial status		
Saving	24	23.3
Suffice	67	65.0
In debt	12	11.7
Paid employment		
Yes	56	54.4
No	47	45.6

Note: $n = 103$

Table I. Descriptive general characteristics of TB patients

Variables	Frequency (*n*)	%
HIV status		
Positive	15	14.6
Negative	88	85.4
Patient delay		
Yes	67	65.0
No	36	35.0

Note: $n = 103$

Table II. Descriptive factors included HIV status, transport, distance to a health facility and patient delay status of TB patients

odds ratio (OR) and 95% confidence interval (CI). The statistical significance level was defined as a two-tailed at the 5 percent level.

Ethical consideration

This study was approved by the Ethics Review Committee for Research Involving Human Research Subjects, Health Science Group, Chulalongkorn University (COA 166/2018) and Chiang Rai Provincial Public Health Office (CRPPHO 27/2561).

Results

The general characteristics, HIV status and patient delay status of 103 TB patients from four border hospitals in Chiang Rai province are presented in Table I. Most of the patients were male (65 percent) and 60 years old or more (27.2 percent), while mean ± SD of the patients' age was 50.67 ± 15.98 years. More than half of the patients were Thai (61.2 percent), single (61.2 percent) and had no formal education (48.5 percent). In addition, 65.0 percent of the patients stated that they earned a sufficient income and 54.4 percent were in paid employment. Table II presents the HIV status and patient delay status. The majority of the patients were HIV negative (85.4 percent). Alarmingly, most TB patients (65.0 percent) reported a delay in receiving treatment.

Table III presents an association between the patients' general characteristics and HIV status with patient delay status. Male TB patients with patient delay and non-delay numbered 42 (62.7 percent) and 25 (69.4 percent), respectively. Female TB patients with patient delay and non-delay totaled 25 (37.3 percent) and 11 (30.6 percent), respectively. The majority of patient delays were aged more than 60 years (29.9 percent), while most of the non-delay patients were aged 51–60 years (30.6 percent). Most cases with both patient delay and non-delay had no formal education (52.2 and 41.7 percent), reported being in paid employment (53.7 and 55.6 percent), with sufficient finance (65.7 and 63.9 percent), were single (58.2 and 66.7 percent), were Thai (67.2 and 50.0 percent) and were HIV negative (80.6 and 94.4 percent). There was a statistically significant difference between patient delay and non-delay among TB patients in Chiang Rai province regarding the level of education, nationality and HIV status (p-value < 0.2).

Table IV demonstrates the OR and 95% CI for education, nationality and HIV status with patient delay status of the TB patients in the border hospitals of Chiang Rai province. Nationality and HIV status were statistically significantly associated with patient delay status among the TB patients with a p-value at 0.041 and 0.032, respectively. In addition, the TB patients who were HIV negative had increased 6.806-fold odds of experiencing patient delays compared to patients who were HIV positive (OR = 6.806; 95% CI: 1.174–39.462). Moreover, non-Thai TB patients also had increased 2.824-fold odds of experiencing patient delay compared to Thai TB patients (OR = 2.824; 95% CI: 1.041–7.660). Even though statistically significant association with patient delay was not achieved for education, it was found that patients with formal education had increased 2.528-fold odds of experiencing patient delays compared to patients with no formal education (OR = 2.528; 95% CI: 0.937–6.820).

Discussion

The findings of this study showed that the prevalence of patient delay among 103 TB patients from the border hospitals of Chiang Rai province, Thailand enrolled in this study was high (65 percent). These findings are higher than a study based in Northwest Ethiopia (47.5 percent) among TB patients with the patient treatment delay being more than 30 days before contacting the health facility and starting the treatment. This might be because the majority of the patients who participated in the Northwest Ethiopian study were reported to have a delay of fewer than 30 days[11].

Factors	Patient delay status			
	Non-delay ($n = 36$) n (%)	Delay ($n = 67$) n (%)	χ^2	p-value
Gender				
Male	25 (69.4)	42 (62.7)	0.470	0.493
Female	11 (30.6)	25 (37.3)		
Age group (years)				
⩽20	1 (2.8)	0 (0.0)	5.923	0.296[a]
21–30	4 (11.1)	7 (10.4)		
31–40	8 (22.2)	11 (16.4)		
41–50	4 (11.1)	16 (23.9)		
51–60	11 (30.6)	13 (19.4)		
> 60	8 (22.2)	20 (29.9)		
Level of education				
No formal education	15 (41.7)	35 (52.2)	5.676	0.199[a,*]
Primary school	12 (33.3)	22 (32.8)		
High school	5 (13.9)	8 (22.2)		
Diploma	1 (2.8)	2 (3.0)		
College	3 (8.3)	0 (0.0)		
Paid employment				
Has	20 (55.6)	36 (53.7)	0.031	0.859
Not has	16 (44.4)	31 (46.3)		
Financial status				
Saving	9 (25.0)	15 (22.4)	0.094	0.954
Suffice	23 (63.9)	44 (65.7)		
In debt	4 (11.1)	8 (22.2)		
Marital status				
Married	10 (27.8)	14 (20.9)	4.144	0.231[a]
Single	24 (66.7)	39 (58.2)		
Divorce	0 (0.0)	4 (6.0)		
Widowed	2 (5.6)	10 (14.9)		
Nationality				
Thailand	18 (50.0)	45 (67.2)	3.514	0.182[a,*]
Ethnicity	14 (38.9)	19 (28.4)		
Myanmar	4 (11.1)	3 (4.5)		
HIV				
Positive	2 (5.6)	13 (19.4)	3.609	0.057*
Negative	34 (94.4)	54 (80.6)		

Notes: [a]Fisher's exact test. *p-value < 0.2

Table III. Association between patient delay status toward the TB patients' general characteristics and HIV status

Our study found that a higher proportion of males (65 percent) who were diagnosed with TB sought treatment at the border hospitals compared to females, which was similar to the studies carried out among TB patients in Northwest Ethiopia and rural Bangladesh[11, 12]. Furthermore, this study, similar to the study conducted in rural Bangladesh, found that age, sex and income did not reach the size of the effect needed to be statistically significant[12]. Most of the TB patients had no formal education (48.5 percent), which was higher than a study completed in Nigeria[13]. However, the study in Nigeria found that education was significantly associated with patient delay, whereas this study found that the level of education was only statistically significant when associated with patient delay at p-value 0.2 and revealed no effect on patient delay by binary logistic regression. This might be because most of the TB patients who had completed a formal education were only educated to the

primary school level. In other studies, the TB patients with higher education (secondary school or higher) were less likely to experience patient delay. On the other hand, the patients who had primary school, elementary school education or lower education were more likely to experience patient delay[14, 15]. Moreover, other demographic variables such as marital, employment and financial status were not statistically significant when associated with patient delay in this study; however, many studies found that being married, being employed and financial insufficiency were associated factors in patient delay[15, 16].

Interestingly, this study found that HIV negative patients were more likely to experience patient delay. This might be because the people living in the northern part of Thailand, where HIV and TB are both prevalent fears being detected with HIV and TB and this resulted in a delay of treatment for the diseases[17]. Similarly, a study in Ghana also found that the patients who were HIV positive were less likely to delay seeking TB treatment[18]. However, HIV status was not the only cause for patient delay as nationality was also an issue. Non-Thai patients were more likely to experience some patient delay. Similar to the result from a previous study based in Italy, it was found that foreign-born individuals accounted for a large proportion of TB cases that went unnoticed, which contributed to the challenge of TB elimination in Europe[19].

This study suggests that further intervention involving increasing TB knowledge and awareness especially among the non-Thai population along the border areas in Chiang Rai Province would be useful. In addition, it should also emphasize reducing any stigma associated with TB. These suggestions may help reduce the delay in seeking treatment and increase the utilization of the health facility, which in turn supports the improvement of the TB control and elimination program.

It is important to take into consideration the limitations of this study. We excluded all patients under the age of 18 years, as well as other non-diagnosed TB patients. Furthermore, we did not enroll patients who sought treatment from other hospitals. Finally, this study is a cross-sectional design; therefore, no causal inferences could be possible.

Conclusion

In conclusion, a high percentage of TB patients who received treatment at the border hospitals in Chiang Rai province and participated in this study were reported as experiencing a patient delay in seeking TB treatment from the health facility. Additionally, HIV status and nationality were factors that affected those associated with patient delays in this study. Therefore, further intervention emphasizes increasing TB knowledge and the reduction of stigma around TB especially with non-Thai nationals and should be implemented in the border areas of Chiang Rai province. It could help improve and increase the utilization of the health facility and assist with seeking early treatment among suspected TB patients.

Table IV.
Odds ratio and 95% confidence interval of patient delay in relation to education, HIV status and nationality of the TB patients

Variables	*B*	OR	*p*-value	95% CI Lower	Upper
Education					
No formal education		Ref.			
Formal education	0.928	2.528	0.067	0.937	6.820
Nationality					
Thai		Ref.			
Non-Thai	1.038	2.824	0.041*	1.041	7.660
HIV status					
Positive		Ref.			
Negative	1.918	6.806	0.032*	1.174	39.462

Notes: Ref: reference group. *p-value < 0.05

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