Delay in Pulmonary Tuberculosis Suspicion and Isolation among Hospitalized Patients: Songklanagarind Hospital Perspective

Boonsri Charoenmak BSc*, Somkiet Worayuttakarn MD*,
Sarunyou Chusri MD*, Khachornsakdi Silpapojakul MD*

** Department of Internal Medicine, Faculty of Medicine, Prince of Songkla University, Hat Yai, Songkhla, Thailand*

Objective: *To study the factors influencing delayed pulmonary tuberculosis suspicion and isolation among hospitalized patients in Songklanagarind Hospital.*
Material and Method: *A prospective study examining the microbiologically confirmed pulmonary tuberculosis patients who were admitted in the hospital. The data collected included demographic data, HIV status, initial symptoms, and chest radiographs.*
Results: *Sixty inpatients were identified. Forty-five percent and 30% of patients were admitted. There was delay in suspicion of pulmonary tuberculosis and delay in isolation in 18 (30%) and 24 (40%) patients, respectively. There was no statistical significance among delayed and non-delayed groups of pulmonary tuberculosis suspicion and isolation.*
Conclusion: *The pulmonary tuberculosis suspicion and isolation should concern patients for whom TB is an etiologic implication.*

Keywords: *Delay, Suspicion, Isolation, Pulmonary tuberculosis*

J Med Assoc Thai 2012; 95 (4): 493-6
Full text. e-Journal: *http://www.jmat.mat.or.th*

Pulmonary tuberculosis is one of the global health problems especially in resource-limited countries[1]. The rising number of HIV infection patients influences the transmission of tuberculosis in communities and hospitals[2,3]. The nosocomial transmission of tuberculosis affected inpatients and health care workers[4]. Furthermore, the transmission potentially carried the multidrug resistant Mycobacterium tuberculosis (MDR-TB)[3,5-7]. Since 1994, Centers for Disease Control and Prevention (CDC) recommended the guideline for control the nosocomial transmission of tuberculosis including administration for diagnosis, engineering controls and personal respiratory protections[8].

The delay of isolation and suspicion were demonstrated as important factors influencing the nosocomial transmission[9-11]. The systematic review which done in the 9 low and middle income countries (including Thailand) during 1997 thought 2004 showed the time delays was averagely varied from 7 days to 168 days[11]. HIV infection, male patients atypical clinical manifestation and atypical chest radiography were associated with the delay of suspicion and isolation[11]. The present study was performed to examine the factors influencing the health system delay suspicion as well as isolation of inpatients with pulmonary tuberculosis in a tertiary care hospital.

Correspondence to:
Chusri S, Infectious Diseases Unit, Department of Internal Medicine, Faculty of Medicine, Prince of Songkla University, Hat Yai, Songkla 90110, Thailand.
Phone: 074-451-452, Fax: 074-429-385
E-mail: sarunyouchusri@hotmail.com

Material and Method

The present study was performed in Songklanagarind Hospital, the tertiary care center in southern Thailand between August 2008 and June 2009. The hospitalized patients with microbiologically confirmed pulmonary tuberculosis were enrolled. Their sputa were positive for acid fast bacilli (AFB) staining with auramine method and positive culture for Mycobacterium tuberculosis. The present study collected epidemiological data, clinical presentations, and radiographic findings.

Suspicion delay were defined with more than 24 hours from admission to send sputum for AFB

staining and isolation delay were defined with more than 24 hours to admission in a respiratory isolated room. The data of delay suspicion and isolation were compared with of non-delay suspicion and isolation with student t-test for continuous variables and with Chi-square test (x^2) or Fisher's exact test for numeric variables. Significance was determined with p-value less than 0.05.

Results

Sixty patients with microbiologically confirmed pulmonary tuberculosis were admitted in Songklanagarind Hospital between August 2008 and June 2009. Demographic, clinical, and radiographic data were demonstrated in Table 1. The majority of the subjects were elderly. Eighteen patients (30%) had delayed sputum examination with AFB staining (delayed suspicion), and 24 patients (40%) had delayed admission in respiratory isolation rooms (delayed isolation).

Respiratory symptoms including cough, hemoptysis, and dyspnea were significantly associated with the patients without delayed suspicion ($p < 0.05$). There was no radiographic finding of influenced suspicion delay. The presenting symptom with hemoptysis was still significantly related with the patients without delay isolation ($p < 0.05$). There was no chest radiographic finding related with delayed or non-delayed isolation. There was no significant proportion of HIV infection, diabetes mellitus, and steroid use among the patients with and without delayed suspicion, as well as among the patients with and without delayed isolation.

The average interval from admission to suspicion was five days in the patients with delayed suspicion. The average interval from admission to isolation was also 5 days in the patients with delayed isolation. There was no significant different demographic data, underlying disease, clinical manifestation, and radiographic finding between the patients with delayed suspicion and delayed isolation.

Discussion

The present study demonstrated the high proportion (40%), and similar rate of delayed isolation of pulmonary tuberculosis, compared with the study of western country of 30 to 40% during the 1980s and early 1990s[12].

Delay in isolation was ascribed primarily to delicate disease both respiratory symptoms and chest radiography. One study of TB care from 1996 to 1999 suggested transferring the tuberculosis patient in isolation room when AFB smear was positive[13]. In general, the AFB smear-positive among the respiratory symptomatic individuals was 5%, these results confirm reports that underscore the need for and importance of this strategy[14].

For proper isolation, five predictive variables were suggested: 1) chest radiograph with upper lobe infiltrate or 2) cavity, 3) history of having known someone with tuberculosis, 4) self-reported positive tuberculin skin test, and 5) self-reported isoniazid preventive therapy. Using these variables to determine which patients required isolation would have decreased the number of isolated non-tuberculous patients from 253 to 95, but it would have missed eight of 42 patients with tuberculosis[15].

The best practices would require for TB isolation for all patients undergoing diagnostic evaluation for TB. However, the existing is the resource limitations impact on the ability of the hospital to close the best practices. The limitation of the present study

Table 1. Comparison between the patients with delayed suspicion and isolation of pulmonary tuberculosis

	Total (n = 60)	Delayed suspicion (n = 18)	Delayed isolation (n = 24)	OR	p-value
Age, years [mean (range)]	61 (3-92)	54 (19-92)	56 (27-84)		0.78
Sex, male (%)	38 (63.3)	13 (72.2)	15 (62.5)	0.64 (0.17-2.40)	0.51
Associated co morbidity (%)					
HIV infection	12 (20.0)	4 (22.2)	3 (12.5)	0.50 (0.10-2.58)	0.44
Diabetes mellitus	8 (13.3)	5 (27.8)	6 (25.0)	0.87 (0.22-3.46)	1.00
Steroid use	6 (10.0)	3 (16.7)	6 (25.0)	1.67 (0.56-7.82)	0.71
Radiologic suspicion (%)	41 (68.3)	13 (72.2)	17 (70.8)	0.93 (0.64-3.63)	0.92

OR = odds ratio

is based on microscopic smear and medical records, with discharge diagnosis of TB, rather than among persons identified by admission characteristics.

In conclusion, in the present study, there was no statistical significance among delayed and non-delayed groups of pulmonary tuberculosis suspicion and isolation. However, the pulmonary tuberculosis suspicion and isolation should be of concern in those for whom TB is an etiologic implication.

Potential conflicts of interest

None.

References

1. World Health Organization. Global tuberculosis database [Internet]. 2006 [cited 2010 Mar 1]. Available from: http://www.who.int/tb/country/global_tb_database/en/index2.html
2. Styblo K. Epidemiology of tuberculosis. The Royal Netherlands Tuberculosis Association 1991; 24: 53-4.
3. Edlin BR, Tokars JI, Grieco MH, Crawford JT, Williams J, Sordillo EM, et al. An outbreak of multi-drug-resistant tuberculosis among hospitalized patients with the acquired immunodeficiency syndrome. N Engl J Med 1992; 326: 1514-21.
4. Driver CR, Stricof RL, Granville K, Munsiff SS, Savranskaya G, Kearns C, et al. Tuberculosis in health care workers during declining tuberculosis incidence in New York State. Am J Infect Control 2005; 33: 519-26.
5. Pearson ML, Jereb JA, Frieden TR, Crawford JT, Davis BJ, Dooley SW, et al. Nosocomial transmission of multidrug-resistant Mycobacterium tuberculosis. A risk to patients and health care workers. Ann Intern Med 1992; 117: 191-6.
6. Beck-Sague C, Dooley SW, Hutton MD, Otten J, Breeden A, Crawford JT, et al. Hospital outbreak of multidrug-resistant Mycobacterium tuberculosis infections. Factors in transmission to staff and HIV-infected patients. JAMA 1992; 268: 1280-6.
7. Frieden TR, Fujiwara PI, Washko RM, Hamburg MA. Tuberculosis in New York City—turning the tide. N Engl J Med 1995; 333: 229-33.
8. Centers for Disease Control and Prevention. Guidelines for preventing the transmission of Mycobacterium tuberculosis in health-care facilities, 1994. MMWR Recomm Rep 1994; 43: 1-132.
9. Wu YC, Hsu GJ, Chuang KY, Lin RS. Intervals before tuberculosis diagnosis and isolation at a regional hospital in Taiwan. J Formos Med Assoc 2007; 106: 1007-12.
10. Stroud LA, Tokars JI, Grieco MH, Crawford JT, Culver DH, Edlin BR, et al. Evaluation of infection control measures in preventing the nosocomial transmission of multidrug-resistant Mycobacterium tuberculosis in a New York City hospital. Infect Control Hosp Epidemiol 1995; 16: 141-7.
11. Sreeramareddy CT, Panduru KV, Menten J, Van den EJ. Time delays in diagnosis of pulmonary tuberculosis: a systematic review of literature. BMC Infect Dis 2009; 9: 91.
12. Cegielski JP, Goetz MB, Jacobson JM, Cohn SE, Weinstein RA, DeHovitz JA, et al. Gender differences in early suspicion of tuberculosis in hospitalized, high-risk patients during 4 epidemic years, 1987 to 1990. Infect Control Hosp Epidemiol 1997; 18: 237-43.
13. Rozovsky-Weinberger J, Parada JP, Phan L, Droller DG, Deloria-Knoll M, Chmiel JS, et al. Delays in suspicion and isolation among hospitalized persons with pulmonary tuberculosis at public and private US hospitals during 1996 to 1999. Chest 2005; 127: 205-12.
14. Siqueira-Batista R, Gomes AP, Bisaglia JB, Borlot PE, D'avila Junior HX, Faria CG, et al. Screening for pulmonary tuberculosis in Teresopolis, RJ, Brazil: the search for respiratory symptomatic patients in emergency service of "Hospital das Clinicas de Teresopolis Costantino Ottaviano, Fundacao Educacional Serra dos Orgaos". Rev Inst Med Trop Sao Paulo 2005; 47: 117-8.
15. Bock NN, McGowan JE Jr, Ahn J, Tapia J, Blumberg HM. Clinical predictors of tuberculosis as a guide for a respiratory isolation policy. Am J Respir Crit Care Med 1996; 154: 1468-72.

ความล่าช้าในการวินิจฉัยวัณโรคปอด และแยกผู้ป่วยใน: มุมมองของโรงพยาบาลสงขลานครินทร์

บุญศรี เจริญมาก, สมเกียรติ วรยุทธการ, ศรัญญู ชูศรี, ขจรศักดิ์ ศิลปโภชากุล

วัตถุประสงค์: *เพื่อศึกษาปัจจัยที่ส่งผลต่อการล่าช้าในการวินิจฉัยสงสัยและแยกผู้ป่วยวัณโรคปอดในโรงพยาบาลสงขลานครินทร์*

วัสดุและวิธีการ: *เก็บข้อมูลแบบมุ่งหน้าของผู้ป่วยในที่ตรวจทางจุลชีววิทยายืนยันว่าเป็นวัณโรคปอด การเก็บรวมถึงข้อมูลทั่วไป สภาวะโรคคดส์ อาการเริ่มต้น และภาพรังสีทรวงอก*

ผลการศึกษา: *มีผู้ป่วย 60 ราย ความล่าช้าในการสงสัยวินิจฉัย เกิดขึ้นกับผู้ป่วย 18 คน (ร้อยละ 30) และความล่าช้าในการแยกผู้ป่วย 24 คน (ร้อยละ 40) ตามลำดับ ไม่มีความแตกต่างอย่างมีนัยสำคัญระหว่างผู้ป่วยที่ล่าช้าในการวินิจฉัยสงสัยและล่าช้าในการแยก*

สรุป: *ความล่าช้าในการวินิจฉัยวัณโรคปอดและการแยกผู้ป่วยเป็นสิ่งที่ตระหนักอย่างสอดคล้องกัน*