

EXTRA-PULMONARY TUBERCULOSIS AT A REGIONAL HOSPITAL IN THAILAND

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Abstract. The purpose of this study was to analyze the cases of extra-pulmonary tuberculosis (EPTB) at Maharat Nakhon Ratchasima Hospital, a tertiary care regional hospital in Northeast Thailand. There were 398 cases of EPTB (46.9%) and 450 cases of pulmonary tuberculosis (PTB) (53.1%). The mean age of EPTB patients (47.58 years) was lower than that of PTB patients (51.6 years) ($p < 0.01$). Human Immunodeficiency Virus (HIV) seropositivity was found in 50 cases of EPTB (12.6%) and 55 cases of PTB (12.2%) which was not significantly different. The common sites of extra-pulmonary involvement were the lymph nodes (29.7%), followed by the pleura (27.4%), the bones and spine (25.1%), the meninges and brain (4.5%), the pericardium (3.5%) and the gastrointestinal tract (3.0%). Disseminated TB occurred in only 8 cases (2.0%). HIV seropositivity rates were more common in disseminated TB (OR 41.51, 95%CI 4.98-34.5), TB of the meninges and brain (OR 4.47, 95%CI 1.57-12.6) and TB of the lymph nodes (OR 3.49, 95%CI 1.86-6.54) and were less common in TB of the bones and spine (OR 0.05, 95%CI 0.01-0.37) and TB of the pleura (OR 0.24, 95%CI 0.09-0.63).

INTRODUCTION

Tuberculosis (TB) is a disease that can affect many systems in the body. Pulmonary tuberculosis (PTB) in the United States declined by 48% from 1992 to 2006, extra-pulmonary tuberculosis (EPTB) declined by 27%, increasing the proportion of EPTB from 16% in 1992 to 21% in 2006 (CDC, 2006). Currently, about 22% of all cases of TB in eastern Europe are EPTB, ranging from 13% in Greece to 40% in Norway (EUROTB, 2002). Several studies have shown that human immunodeficiency virus (HIV) infected persons are more vulnerable than non-infected persons to developing EPTB (Anonymous, 1986, 1987).

Thailand has a high TB disease burden.

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The estimated annual incidence rate for all types of TB in Thailand is 142 per 100,000 people. The annual incidence of new smear-positive TB cases is 63 per 100,000 (WHO, 2007). EPTB was 12% of the total TB cases in 2003 (TB cluster, 2004).

The purpose of this study was to analyze the cases of EPTB at the Maharat Nakhon Ratchasima Hospital (MNRH), Thailand, in order to understand the local epidemiology and the clinical picture in HIV infected patients.

PATIENTS AND METHODS

MNRH is a tertiary care regional hospital serving Nakhon Ratchasima Province which has a population of about 2,500,000. It is also a referral hospital serving 4 provinces nearby which have more than 6,500,000 people.

All patients registered for TB treatment at the Tuberculosis Registration Unit MNRH from 1 January 2007 to 31 December 2007 were studied. Data were obtained from a

computerized database. The patients were divided into EPTB and PTB groups. The two groups were compared in respect to age, sex, co-morbidity such as diabetes mellitus, HIV infection, and into case categories (new case or previously treated case).

Data from the EPTB and PTB cases were compared using the odds-ratio (OR), Fisher's exact test and Student's *t*-test. A *p*-value <0.05 was accepted as statistically significant.

Definitions

PTB refers to a disease involving the lung parenchyma. A patient with both PTB and EPTB were classified as a case of PTB (WHO, 2003).

EPTB refer to tuberculosis of organs other than the lung, such as the pleura, lymph nodes, abdomen, genitourinary track, skin, spine, bones, or meninges. A diagnosis was based on one culture-positive specimen, or histology or strong clinical evidence consistent with active EPTB, followed by a decision from the clinician to treat with a full course of tuberculosis chemotherapy (WHO, 2003).

RESULTS

Of 848 cases of TB registered in 2007, 398 (46.9%) had EPTB, 450 (53.1%) had PTB. The mean age of the EPTB patients (47.58±19.23 years) was lower than that of PTB patients (51.62±18.07 years) (*p* < 0.01). Forty-two point seven percent of EPTB cases and 33.8% of PTB cases were female (*p* = 0.16); only 4 cases of EPTB (1.0%) and 17 cases of PTB (3.8%) had diabetes mellitus (*p* = 0.20). HIV infection was found in 50 cases of EPTB (12.6%) and 55 cases of PTB (12.2%) (*p* = 0.067). Previously treated cases were comprised of 22 cases (5.5%) of EPTB and 56 cases (12.4%) of PTB (*p* = 0.31) (Table 1).

Of the 398 EPTB cases, the common sites affected were lymph nodes (118 cases, 29.6%), pleura (109 cases, 27.4%), bones and spine (100 cases, 25.1%), meninges and brain (8 cases, 4.5%), pericardium (14 cases, 3.5%), gastrointestinal tract (12 cases, 3.0%), disseminated form (8 cases, 2.0%), genitourinary (5 cases, 1.3%), skin (2 cases, 0.5%) and other (12 cases, 3.0%) (Table 2). The methods of

Table 1
Characteristics of patients with extra-pulmonary tuberculosis and pulmonary tuberculosis.

	EPTB <i>n</i> (%)	PTB <i>n</i> (%)	<i>p</i> -value
Age (mean ± SD)	47.58±19.23	51.62±18.07	0.0017
Sex			
Male	228(57.3)	298(66.2)	0.16
Female	170(42.7)	152(33.8)	
Diabetes mellitus	4(1.0)	17(3.8)	0.20
HIV serology			
Seropositive	50(12.6)	55(12.2)	0.067
Seronegative	256(64.3)	219(48.7)	
Untested	92(23.1)	176(39.1)	
Case category			
New case	376(94.5)	394(87.6)	0.31
Previously treated case	22(5.5)	56(12.4)	
Total	398(46.9)	450(53.1)	

Table 2
Frequency of organ involvement and method of diagnosis.

Site	Histology <i>n</i> (%)	Clinical <i>n</i> (%)	Total <i>n</i> (%)
Lymph nodes	118 (100)	0 (0)	118 (29.6)
Pleura	14 (13)	95 (87)	109 (27.4)
Bone, spine	26 (26)	74 (74)	100 (25.1)
Meninges and brain	3 (17)	15 (0)	18 (4.5)
Pericardium	3 (21)	11 (79)	14 (3.5)
Gastrointestinal	12 (100)	0 (0)	12 (3.0)
Disseminated	0 (0)	8 (100)	8 (2.0)
Genitourinary	5 (100)	0 (0)	5 (1.3)
Skin	1 (50)	1 (0)	2 (0.5)
Other	5 (42)	7 (58)	12 (3.0)
Total	187 (47.5)	207 (52.5)	398 (100)

Table 3
Frequency of organ involvement and HIV serostatus.

Site	HIV-seropositive <i>n</i> (%)	HIV-seronegative <i>n</i> (%)	Untested <i>n</i> (%)	Odds ratio OR (95%CI)
Lymph node	25 (21.2)	57 (48.3)	36 (30.5)	3.49 (1.86-6.54)
Pleura	5 (4.6)	81 (74.3)	23 (21.1)	0.24 (0.09-0.63)
Bone, spine	1 (1.0)	74 (74.0)	25 (25.0)	0.05 (0.01-0.37)
Meninges and brain	7 (38.9)	9 (50.0)	2 (11.1)	4.47 (1.57-12.6)
Pericardium	1 (7.1)	10 (71.4)	3 (21.4)	0.50 (0.06-4.01)
Gastrointestinal	3 (25.0)	9 (75.0)	0 (0.0)	1.75 (0.46-6.71)
Disseminated	7 (87.5)	1 (12.5)	0 (0.0)	41.51 (4.98-345)
Genitourinary	0 (0)	5 (100.0)	0 (0.0)	
Skin	0 (0)	1 (50.0)	1 (50.0)	
Other	1 (8.3)	9 (75.0)	2 (16.7)	0.56 (0.07-4.52)
Total	50 (12.6)	256 (64.3)	92 (23.1)	

diagnosis are shown in Table 2, 187 cases (47.5%) of EPTB were histologically confirmed, while the rest were clinical diagnosed.

HIV infection was more common in disseminated TB (7 of 8, OR 41.51, 95%CI 4.98-345.87), in TB of the meninges and brain patients (7 of 18, OR 4.47, 95%CI 1.58-12.63), in TB of the lymph nodes (25 of 118, OR 3.49, 95%CI 1.86-6.54), and HIV infection was less

common in patients with TB of the bones and spine (1 of 100, OR 0.05, 95%CI 0.01-0.37) and TB of the pleura (5 of 109, OR 0.24, 95%CI 0.09-0.62) (Table 3).

DISCUSSION

The percentage of EPTB (46.9%) in this survey was much higher than that of other

reports from Thailand (18.1%) (Jittimane *et al*, 2006) and other industrialized countries (28%, 37%) (Baussano *et al*, 2004; Gonzalez *et al*, 2005). The most common sites affected were lymph nodes and pleura, which is comparable to another study (Gonzalez *et al*, 2005). It was surprising how common TB of the bones and spine were (25.1%), compared to Hong Kong (4%) (Noertjojo *et al*, 2002), New Orleans in the United State (8.8%) (Kwara *et al*, 2005) and Nepal (12.4%) (Chandrashekhar *et al*, 2008). This may be because hospital-based studies often differ from studies at the national level, especially a tertiary care or referral hospital.

EPTB was common in younger patients, similar to another study (Chandrashekhar *et al*, 2008).

Studies from developed countries have reported an increasing trend of EPTB among HIV infected persons and HIV infection is associated with EPTB (Cailhol *et al*, 2005). A recent study from a large tertiary hospital in South India reported that EPTB had an increasing trend among HIV infected patients (Solomon *et al*, 2006). In our study the overall HIV seropositive rates in EPTB and PTB were around 12% which were not statistically different from each other. HIV seropositivity occurred more commonly in patients with disseminated TB (OR 41.51, 95%CI 4.98-345) which is similar to a study in New Orleans (Kwara *et al*, 2005). HIV seropositivity was also more common in patients with TB of the meninges and brain (OR 4.47, 95%CI 1.57-12.6) and lymph nodes (OR 3.49, 95%CI 1.86-6.54), which is similar to a study from the United States (Barnes *et al*, 1993).

Four point five percent of TB pleura cases and 1% of patients with TB of the bones and spine were HIV seropositive, which is surprisingly low compared to another study (Kwara *et al*, 2005). These results need to be further investigated.

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