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Gender differences in the prevalence of Tuberculous Lymphadenitis at the State of Penang, Malaysia: Findings from a cross-sectional study

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Abstract

Objective: To evaluate the prevalence of tuberculous lymphadenitis on the basis of gender in the northern state of Malaysia.

Materials and Methods: Current study was divided into two phases (Retrospective and Prospective), which was conducted at the Department of Chest in General Hospital Penang. Patient records were reviewed retrospectively, and prospectively to identify patients with confirmed diagnosis of tuberculous lymphadenitis under the clinical signs and symptoms, and laboratory tests from January 2006 to December 2008. Data were analyzed using SPSS version 16.

Results: One hundred and nine patients (7.2%) with confirmed tuberculosis lymphadenitis cases were found, among 1516 of total TB cases. The mean age of the patients was 36.4±12.87. The male to female ratio was 1.4:1. Ethnically, 45 (41.3%) were Malay followed by Chinese 37 (33.9%). Among the risk factors were, HIV and diabetes mellitus, 17 (15.6%) and 11(10.0%) respectively. Cough and fever were the most common symptoms in both gender groups. Night sweat, cough, shortness of breathing were observed more in male than female, while swelling of lymph nodes, loss of appetite, loss of weight, haemoptysis, and chest pain were higher in female. In the majority, 90 (82.5%) positive results were obtained by fine needle aspiration (FNA) cytology. Overall sixty two (56.9%) patients were successfully treated, 5 (4.6%) patients died during the treatment, while male were higher in successfully treated (59.7%).

Conclusion: Incidence of TB Lymphadenitis was found higher among Malay men. Diabetes mellitus and HIV are the most commonly reported risk factors and co-morbidities playing an important role in treatment success while, 12 months treatment were observed among 10 (9.2%) of cases. Treatment successful rate were higher in male as compare to female.

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Introduction:

Tuberculosis (TB) is a major public health problem and leading cause of mortality worldwide. It is estimated that TB kills approximately 1 million women per year and about one billion women are infected with TB worldwide [1]. In comparison, men have higher incidence than the women [2]. However, women are more likely to have extrapulmonary tuberculosis than men [3, 4]. Asian and Black women form the developing countries are at a higher risk in comparison to women from other regions [5].

In Malaysia, tuberculosis is among the top five communicable diseases with incidence rate of 62.6 per 100,000 and mortality rate of 5.37 per 100,000 [13]. Penang is the eighth most populous State in Malaysia and ranked among the top five States with highest incidence of tuberculosis [14]. Previous studies conducted in Malaysia have focused mainly on the pulmonary TB. Limited information is available on the incidence and demographic correlates of extrapulmonary TB among Malaysian population. Current study will share the baseline data on the demographic correlates of TB lymphadenitis.

Materials and Methods:

A cross-sectional, retrospective evaluation of records was conducted from 1st January 2006 till December 2008, at the respiratory clinical Public Hospital, Pulau Penang. Penang state geographically is located in northern Malaysia, a multicultural state comprising of Malay (42.5%), Chinese (46.5%), Indian (10.6%) and minorities (0.4%), with an estimated population of 1.5 million [14].

A review of medical record was conducted according to mentioned time frame. A structured data collection form was used to collect the Patients information concerning the patient history, physical findings, chest radiographs and laboratory investigation. In addition, demographic factors, life style (smoking habit and alcohol use) and clinical characteristics were also recorded.

Diagnosis

Diagnosis of extra-pulmonary tuberculosis (EPTB) is often difficult; however positive chest radiographic findings or positive tuberculin skin test supports the diagnosis, negative results do not exclude EPTB. Radiographic findings of EPTB can help in the diagnosis [25]. The diagnosis of TB Lymphadenitis was based on fine needle aspiration biopsy (FNAB). The diagnosis was also supported by tuberculin skin test, sputum culture acid fast bacilli (AFB).

Operational Definitions were adopted from WHO [19], which is used in the current practice, which shows in Table 1.

Table 1: Operational Definitions Used

Operational Variables	Definitions
Cure	A patient who is sputum smear negative in the last month of treatment and on at least one previous occasion
Treatment completed	A patient who has completed treatment but who does not meet the criteria to be classified as cured or failure
Treatment failure	A patient who is sputum smear positive at five months or later during the treatment
Died	A patient who dies for any reason during the course of treatment
Defaulter	A patient whose treatment was interrupted for 2 consecutive months or more
Transfer out	A patient who has been transferred to another recording and reporting unit and for whom the treatment outcome is not known
Treatment success	The sum of patients cured and those who completed treatment
New	A patient who never had undergone treatment for TB or has taken anti-tubercular therapy for less than one month
Relapse	A patient previously treated for TB who has been declared cured or treatment completed, and is diagnosed with bacteriologically positive (smear or culture) tuberculosis after a period of time.

Ethical consideration and data analysis

The study protocol was approved by Clinical Research Center (CRC), Penang Hospital and Ministry of Health, Malaysia. The data was analyzed by using the statistical software, SPSS version 16®. The data with quantitative variables were expressed by mean (± SD) and range while the qualitative variables were estimated by frequency and percentage. A non-parametric statistics i.e Chi-Square was used to see association among the demographic factors and the incidence of TB Lymphadenitis.

Results

From January 2006 to December 2008, 1516 TB patients were registered at Penang Hospital. Out of these, a total of 109 (7.2%) had TB Lymphadenitis, of whom 58(53.2%) were male and 51(46.8%) were female with a male to female ration of 1.14: 1. The mean age of patients with TB lymphadenitis was 36.4 year ±12.87 (Range 7-72 years). Incidence of TB Lymphadenitis was found significantly in the age group, 21-30 years (*p=0.007*), with a high prevalence among female. Moreover a high prevalence of TB lymphadenitis was cited among Malays followed by Chinese, Indians and others. Detailed information about the patient demographics is shown in Table 2.

The most common co-morbidities reported were, HIV and diabetes mellitus. About 17(15.6%) with a diagnosis of HIV, of whom majority 14(82.35%) were male. Incidence of TB lymphadenitis with co-morbid HIV infection was found statistically significant among male (*p= 0.006*). Details are illustrated in table 2.

Strategy for Diagnosis

For diagnostic purposes apart from physical examination fine needle aspiration (FNA), were used among majority of patients 90.8% (90). However, rest of the patient was diagnosed using other methods like X-ray. On the basis of clinical diagnosis and laboratory results, the sites of lymph nodes were, hilar / paratracheal 93 (85.32%), cervical 12 (11%) axilla 3 (2.7%), and 1 (1.0%) occurred on the middle line of neck.

Outcome of Treatment

All patients received directly observed therapy (DOTS) for a minimum of nine months (Range 8-14 months). Two months EHRZ were used as a therapeutic combination for the 41 (37.6%) of the patients. Records demonstrated that Sixty two (56.9%) of the patients were successfully treated, Nine (8.2%) patient's defaulted treatment and five (4.6%) patients expired during the course of therapy. Successful treatment on the basis of gender was statistically insignificant (p=0.120), but on the basis of percent, male patients (59.7%) was more successful as compared to female (52.9%).

Discussion

TB Lymphadenitis is the most common form of extrapulmonary tuberculosis especially among young adult male [11]. Tuberculosis is responsible for 30-52% of diseases causing lymphadenopathy in developing countries, whereas in developed countries it is only 1.6% [20]. Pathogenesis of tuberculosis adenitis is poorly understood as it remains unclear whether the disease is local or generalized in origin [21].

The main focus of the current study was to compare the incidence of TB lymphadenitis between both sexes and its association with the other demographic factors. Overall a high incidence of TB lymphadenitis was recorded among male patients. Concurrent risk factors such as smoking, alcohol, diabetes mellitus and HIV/ AIDS are predisposing to the incidence of tuberculosis [24]. However, when the data was segregated on annual basis a higher incidence of TB Lymphadenitis was observed among female in year 2007 and 2008. Polesky *et al* have also reported a high prevalence of TB lymphadenitis among female [5]. In terms of age, a high incidence of tuberculosis lymphadenitis was found significant

(p=0.007) in the age group 21-30 year [23, 24].

On ethnic ground, a high incidence of tuberculosis lymphadenitis was observed among Malays. Majority 41.3% (45) of 109 patients were Malay, these findings contradict with the previous findings reported a higher incidence among Chinese [25]. The possible risk factors for a high incidence of TB lymphadenitis among Malays were HIV/AIDS and smoking. However, among Chinese, diabetes mellitus and alcohol use were the evident risk factors. Overall a high risk of TB lymphadenitis was observed among the patients with HIV/AIDS, these findings comply with the findings of Shafer et al, (1991) reported HIV/AIDS to be the most common underlying condition [7].

Majority of the patients in our study presented with typical sign and symptoms which is in line with the findings of other reported studies [26, 27]. It was seen that among men enlarged posterior cervical, bilateral, submandibular, and matted lymph nodes were the frequently seen symptoms. While among female enlarged unilateral, single supraclavicular node were frequent.

In an agreement with the findings of other studies [5], fine needle aspirations (FNA) of the lymph node was the most consistent method to identify the bacteriologic agent responsible for lymphadenopathy. In term of treatment twelve months duration of treatment were being observed in 10 (9.2%) patients, higher than the 3.9% in the pulmonary cohort [29]. The extensive clinical diversity of extra-pulmonary TB can explain this partly, because the treatment time for the extrapulmonary tuberculosis is usually longer than pulmonary tuberculosis. It is also possible that the treatment of the broad variety of different forms of extra-pulmonary tuberculosis is even more unfamiliar to doctors than treating pulmonary tuberculosis. Limited studies were found on risk factors for unfavorable outcome in extra-pulmonary TB. Compared to those studies including all forms of disease, male sex, high age and immunosuppression were risk factors for death as has been previously reported [30, 32].

Conclusions

Incidence of TB Lymphadenitis was found higher among Malay men. Diabetes mellitus and HIV are the most commonly reported risk factors and co-morbidities playing an important role in treatment success while, 12 months treatment were observed among 10 (9.2%) of cases. Treatment successful rate were higher in male as compare to female.

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Conflict of interest:

All the authors have no conflict of interest

Table 2 Demographic information of patients

Variables		Male No. (%) 53.2%(58)	Female No. (%) 46.8%(51)	*p*-value
Range of age (7-72 years)		39±11.7	32±13.3	0.197 Ĭ
Mean age 36.4 ±12.87		Range of age (17-72)	Range of age (7-63)	
Sex ratio (M:F) 1.14: 1				
Year	2006	25 (43.1)	11(21.6)	
	2007	17 (29.3)	20 (39.2)	0.058 ǂ
	2008	16 (27.5)	20 (39.2)	
Race	Malay	25 (43.1)	20 (39.2)	
	Chinese	20 (34.5)	17 (33.3)	0.016 Ĭ
	Indian	11 (18.9)	7 (13.7)	
	Indonesian	2 (3.5)	1 (2.0)	
	Other	1 (1.7)	6 (12.0)	
Age	<20	1 (1.7)	7 (13.7)	
	21-30	11 (18.9)	21 (41.2)	
	31-40	14 (24.1)	6 (12.0)	0.007 Ĭ
	41-50	13 (22.4)	5 (9.8)	
	51-60	12 (20.7)	9 (17.6)	
	Over 60	7 (12.1)	3 (5.9)	
Marital Status	NM	27 (46.5)	18 (35.3)	
	Single	12 (20.7)	13 (25.5)	
	Married	17 (29.3)	20 (39.2)	0.209 Ĭ
	Divorced	2 (3.5)	0 (0.0)	
Employment Status				
	NM	18 (31.0)	11 (21.6)	
	Employed	17 (29.3)	17 (33.3)	0.608 Ĭ
	Un-employed	10 (17.2)	13 (25.5)	
	Business	1 (1.7)	0 (0.0)	
	Retired	1 (1.7)	2 (3.9)	
Cigarette Use				
	Smokers	30 (51.7)	6 (12.0)	
	Ex-Smoker	6 (10.3)	0 (0.0)	0.000 Ĭ
Alcohol Use				
	Yes	10 (17.2)	0 (0.0)	
	Ex-Drinker	4 (6.9)	1 (1.9)	0.014 Ĭ
Case category				
	New TB cases	51 (46.8)	46 (42.2)	
	Defaulters	4 (3.7)	1 (1.9)	0.471 Ĭ
	Relapse	3 (2.8)	4 (3.7)	
	TB with DM	7 (6.4)	4 (3.7)	0.465 ǂ
	HIV AIDS	14 (12.8)	3 (2.7)	0.006 ǂ

ǂ *Chi-square,* Ĭ *Fischer exact, NM (Not Mentioned in Record, * Significant*