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Epidemiology of Tuberculosis among Migrant Workers in Qassim Area, Saudi Arabia

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Abstract: Despite the wealth information that have been gathered about *Mycobacterium tuberculosis* over many decades of research and the availability of live attenuated vaccine, *tuberculosis* remains to be an expanding global health crisis. Understanding Tuberculosis (TB) epidemiology among certain population is essential for the management of overall TB health program. Thus, the present study was carried out to describe the epidemiology of TB among migrant workers in Qassim region, Saudi Arabia. The 165 migrant patients from the neighboring countries majority from South East Asia accessing the TB services at Regional TB center at Qassim were included in this study. The majority of subjects 72 (43.6%) were from Indonesia and India 38 (23%) followed by Nepal 12 (7.2%). Out of 165 patients, 95 (57.6%) were female compared to 70 (42.4%) males with housemaid being the highest (44.8%) with regard to occupational category. Majority of the cases were of middle age and low socio economic status. Fever, loss of appetite, loss of weight and cough were the chief clinical presentations. Among the total cases, 9 cases (5.4%) were suffering from Diabetes. Over all, Prevalence of TB among migrant is relatively high. Preventive measures for early diagnosis should be performed especially in migrant worker from high-prevalence countries.

Key words: Epidemiology, tuberculosis, migrant, Qassim, appetite, Saudi Arabia

INTRODUCTION

Tuberculosis has troubled humankind throughout history. It is estimated that almost a third of the world's population is infected with *M. tuberculosis* causing roughly more 1.8 million deaths annually (Dolin *et al*., 1994). *M. tuberculosis* is known to be the leading cause of death due to a single infectious species (Dye *et al*., 1999; Shin *et al*., 2008). The worldwide annual incidence continues to increase in Africa with 85% new cases because of the HIV epidemic while it is stable or falling in all other regions (WHO, 2006). Although, the majority of infected individuals don't exhibit overt signs of disease, they represent a large pool of infection that allows for new cases to arise and have a risk of reactivation at a later time in their lives (Harries and Dye, 2006). The risk increases significantly when the immune system of infected individual becomes suppressed such as individuals infected with human immune deficiency virus HIV (Dye, 2006; Bentrup and Russell, 2001).

In Saudi Arabia the total number of cases of Tuberculosis (TB) in 2006 (pulmonary and extra-pulmonary) was 3646. The incidence rate was 15.4/100,000 with an increase of 0.53/100,000 in comparison with the same rate recorded in the previous year. Cases of pulmonary TB constituted 70.6% while the extra-pulmonary TB cases constituted 29.4% of the total cases in this year (Ait-Khaled *et al*., 2001). In addition, Saudi Arabia in general with its developmental projects is known to attract lot of international work force from Asian and African countries with high prevalence of tuberculosis. Therefore, this study was carried out aiming to determine epidemiological and clinical characteristics of TB cases among migrant worker in Qassim region, Saudi Arabia between January 2005 and December 2009.

MATERIALS AND METHODS

This study was conducted in a regional TB center in Qassim region that lies approximately at the centre of the Arabian Peninsula. It was conducted as a retrospective study based on the secondary data pertaining to the patients registered in hospital from Jan 2005 to December 2009.

A total of 165 patients registered at the hospital were included in the study. Patients' case sheets were used as source of data. Findings were cross-checked with TB-Lab register, TB register and TB cards of patients. Apart from demographic profile of the patients, the presenting symptoms, co-morbid conditions, diagnostic methods used and treatment regimen given were also assessed. The study was approved by the ethics and research committee of Qassim University and the authorities of TB regional hospital. Data collected is entered and analyzed using Epi_info software (CDC Atlanta).

RESULTS AND DISCUSSION

The study comprised of all the migrants population with confirmed TB registered during 2005-09. There were a total of 165 migrant attracted to Qassim various developmental projects from the neighboring countries mainly from South East Asia accessing the TB services at Regional TB center at Qassim. Out of the total 165 migrant patients, the majority 72 (43.6%) of the patients registered were from Indonesia, India with 38 (23%) cases followed by Nepal 12 (7.2%), Philippines 9 (5.4%), Bangladesh 9 (5.4%) and Pakistan 8 (4.8%). The remaining patients were from other countries like Sudan, Egypt, Jordan, Srilanka, Syria, Afghanistan and Morocco as shown in Fig. 1.

There were more female patients 95 (57.6%) compared to males 70 (42.4%) among the total 165 cases diagnosed with either pulmonary or extra pulmonary cases of TB (Table 1). The majorityof subjects 94 (57%) were in the age group of 16-30 years followed by 61 cases (37%) in the age group of 31-45 years indicating 94% of cases under 45 years of age (Table 2). A total of 125 (75.75%) patients were married while only 40 cases (24.24%) were unmarried or with single status (Table 3).

Out of 165 cases included in the study the details about occupation were studied and distribution of the occupational categories is shown. It was observed that housemaids category were 74 (44.8%), daily laborers contributed to 38 (23%) cases followed by people involved in agricultural work with 20 cases (12.12%) as shown in Fig. 2.

Patients with both pulmonary and extra pulmonary TB had various clinical presentations but they had complaints similar to the typical TB case presentation. The majority 132 (80%) were admitted with fever, 122 cases (74%) had loss of appetite, 119 patients (72.1%) had loss of weight, 91 (55.1%) complaining of cough with expectoration and 61 (37%) were presenting with chest pain (Table 4).

It was observed that in few patients there were other co-morbid conditions associated like Diabetes mellitus in 9 (6%) cases, 2 patients (1.2%) were also suffering from chronic lung disease and 2 cases (1.2%) were on immunosuppressive therapy.

For the purpose of diagnosis, sputum microscopy, CXR and Tuberculin test were conducted on patients. It was observed that out of 91 cases (55.1%) who had sputum, 68 (74.7%) patients were sputum positive for AFB. The CXR examination was done for all patients and it showed positive signs on 101 (61.2%) of cases. Out of total 165 Tuberculin skin tests 134 (81.2%) showed the positive reaction. Of the total 165 TB cases, 160 (97%) were new cases and 4 (2.4%) were relapse cases and one default case. The majority of them 84 (51%) cases are extra pulmonary and 78 (47.3%) were pulmonary cases followed by 3 (1.8%) cases with both pulmonary and extra-pulmonary involvement.

Table 1: Sex status of the TB cases among migrant included in the study

Sex	Number	Percentage
Male	70	42.4
Female	95	57.6
Total	165	100.0

Table 2: Age group distribution of study subjects

Age (years)	Number	Percentage
0-5	2	1.2
16-30	94	57.0
31-45	61	37.0
46-60	6	3.6
>60	2	1.2
Total	165	100.0

Table 3: Marital status of study subjects

Marital status	Number	Percentage
Married	125	75.75
Unmarried and/or single status	40	24.24
Total	165	100.00

Table 4: Distribution of patients by presenting complaints

Presenting complaint	Number	Percentage
Fever	132	80.0
Loss of appetite	122	74.0
Loss of weight	119	72.1
Cough	91	55.1
Night sweats	98	59.4
Cheat pain	61	37.0
Lymph node involvement	37	22.4

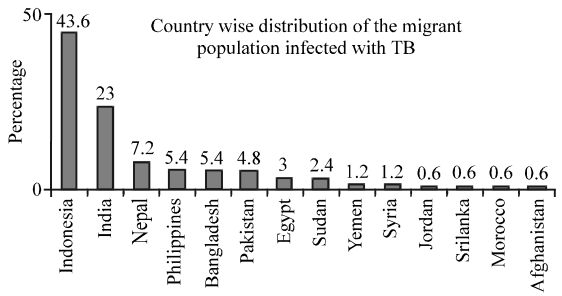

Fig. 1: Ethnicity status of patients' participants

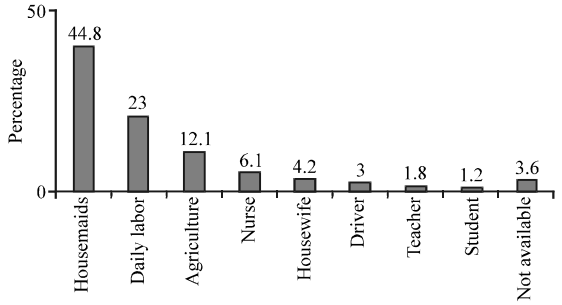

Fig. 2: Occupational status of the TB patients included in the study

Table 5: Distribution of TB patients as per the DOTS regimen

DOTS regimen	Number	Percentage
CAT I	105	63.6
CAT II	5	3.0
CAT III	55	33.3

Previous studies have indicated that importation of TB cases from other communities is part of the TB burden where migration form countries endemic for TB account for a significant proportion of tuberculosis cases in some countries (Pedersen and Revsbech, 1999). Immigrants usually develop active TB mainly as the result of reactivation of latent infection yet increased incidence of primary TB has also been reported (Zaman, 1991) However, only limited number of studies addressing this issue with regard to tuberculosis in migrant worker in Saudi Arabia. The impact of this concept can be seen clearly in Saudi Arabia where African and Asian Mycobacterial variants were isolated from Saudi and non-Saudi patients (Zaman, 1991). Thus, the national guidelines recommend screening recent immigrants from countries with a high TB prevalence for better border control (Centers for Disease Control and Prevention, 2000).

Tuberculosis is very highly infectious disease particularly when the smear positive for Acid fast bacilli (Manoff *et al*., 1991). The majority of subjects visiting TB regional center included in this study were from Indonesia followed by India and Nepal. It is thus valuable to screen this high risk population in order to identify latent infection with TB which pose a threat to the receiving communities.

Tuberculosis is still a disease of economically productive age group among the low socio-economic strata of the society. About (94%) of TB patients belonged to the age group of 16-45 years. Similar results were reported previously in a study conducted in Jammu and Kashmir, majority (76%) of the in patients were in middle age (Bahl *et al*., 2007). All patients attended the TB center with chief clinical presentations of TB including fever, loss of appetite, loss of weight and cough with expectoration. WHO-DOTS regimen remains the standard of treatment of TB cases with 100% of cases treated according to the WHO-DOTS regimen for the diagnosis and treatment. Findings of this study revealed an important facts that sputum microscopy which is cost effective proved to be a successful tool for the diagnosis where it showed a positive rate of 75% (p) among those with productive sputum.

All the cases were treated with DOTS regimen as per the guideline (ATS-CDC, 2003). Of the 165 patients, 105 (63.6%) patients were put under CAT I, 5 cases (3%) on CAT II and 55 cases (33.3%) on CAT III (Table 5).

CONCLUSION

Findings of this study confirmed that prevalence of TB among migrant is relatively high which contribute to the prevalence of TB mainly those coming from South East Asia countries. This study suggests that preventive measures for early diagnosis should be incorporated in the migration process particularly persons from countries endemic for TB for better control.

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