

GLOBAL HEALTH & TUBERCULOSIS: A RETROSPECTIVE STUDY

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ABSTRACT

Introduction: A retrospective study to explore the epidemiology and clinical characteristics of Tuberculosis among Saudis, migrant workers from SAARC and other nations. The objective of this study is to study the prevalence and clinical features of Tuberculosis among Saudis & other migrant workers in central Saudi Arabia.

Methodology: A Retrospective study was conducted based on the secondary data pertaining to the patients registered at Regional TB center in Buraidah Central Hospital from Jan 2005 to December 2009.

Results: A total of 355 case records were included of which 187 cases are from Saudi Arabia and remaining 168 were from South Asian countries. Cough with expectoration, fever with evening rise, loss of appetite were the chief clinical presentations. Out of the total non Saudi patients, the Indonesian patients contribute to 74 (21%) followed by Indians 39 (11%), Nepalese 12 (3.4%), Philippines & Bangladesh with 9 cases each (2.5%), and Pakistan with 8 cases (2.3%). Among the total cases, there were 341 (96%) new cases, 12 (3.4%) relapse cases and 2 (0.6%) defaulters.

Conclusion: Prevalence of TB among migrant is relatively high. Preventive measures for early diagnosis should be performed especially among migrant workers from countries with high-prevalence of Tuberculosis.

Key words: Epidemiology, Migrant, Prevalence, SAARC nationals, Tuberculosis

INTRODUCTION

Tuberculosis (TB) has troubled humankind throughout history. Tuberculosis (TB) is an ancient disease that has affected mankind for more than 4,000 years. It is a chronic disease caused by the bacillus *Mycobacterium tuberculosis* and spreads from person to person through air. TB usually affects the lungs but it can also affect other parts

of the body, such as brain, intestines, kidneys, or the spine. Although a declining trend was observed in most developed countries, this was not evident in many developing countries. Global health is now considered important for national and international security, domestic and global economic well-being. In 2011, there were an estimated 8.7 (range, 8.3–9.0 million) million incident cases (equivalent to 125 cases per 100 000 population) of TB globally.¹ *M. tuberculosis* is known to be the leading cause of death due to a single infectious agent.^{2,3 & 4} The worldwide annual incidence continues to increase in Africa with 85% new cases because of the human immune deficiency virus (HIV) epidemic, whereas it is stable or falling in all other regions.¹ Although the majority of infected individuals don't exhibit overt signs of disease, they represent a

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large pool of infection that allows for new cases to arise and have a risk of reactivation at a later time in their lives.⁶ The risk increases significantly when the immune system of infected individual becomes suppressed, such as individuals infected with HIV.^{7,8}

An accurate description of TB is difficult to obtain because of poor diagnostic facilities and reporting systems in many countries where infection is dominant.⁹ The best information available on global TB comes from the World Health Organization (WHO) with Southeast Asia holding the highest number of people infected with TB in the world.

Cases of pulmonary TB constituted 70.6% while the extra-pulmonary TB cases constituted 29.4% of the total cases in 2006.¹⁰ In addition, Saudi Arabia in general with its developmental projects is known to attract a lot of international work force from Asian and African countries where infections might be dominant. Therefore, this study was carried out aiming to determine epidemiological and clinical characteristics of TB cases among general population in Qassim region, Saudi Arabia between January 2005 and December 2009 and to provide valuable insight on pulmonary and extra-pulmonary TB. Saudi Arabia has a population of 28 million of which 8 million (28.5%) is contributed by the migrant population mainly from India, Pakistan, Bangladesh, Sri Lanka, Philippines & Egypt. The remarkable economic and social developments and the large investments in health care services over the past 20 years are expected to have a positive impact on the incidence of TB in Saudi Arabia. Unfortunately, TB control seems to be facing challenges in several regions. The high influx of workers from high burden countries and the large volume of religious visitors together with many illegal immigrants are some of the challenges. There may also be some defects in TB control strategies that need to be evaluated and improved.¹¹

METHODOLOGY

Study population and Data collection:

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 January 2005 to December 2009. The study got ethical clearance from the Ethics & Research Committee of Qassim University and prior permission was taken from the hospital authorities to conduct this study. Out of 400 cases, the records were scrutinized and completeness of the data available for 355 cases were included and analyzed for the present study. A total of 355 patients registered at the hospital were included in the study. The patients registered at this hospital were coming from all the parts of Al Qassim province which is a representative sample. Patients' case sheets were used as source of data. A detailed questionnaire including the information on socio economic conditions, personal history and clinical history was developed and these variables were analyzed in the study to give a clear picture of epidemiology of TB in the region. 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 were also assessed. The cases were diagnosed by the medical officer of the hospital as per the WHO classification using the direct sputum examination and chest X-ray. Montoux test was also done on all the patients.

Ethical consideration and Statistical analysis:

The study was approved by the Ethics and Research Committee of Qassim University and the hospital authorities of TB regional center. Data collected through structured questionnaires is entered and analyzed using Epi_info software (CDC Atlanta). Simple proportions and percentage were used and statistical analysis was done to see the association between TB and other variables.

RESULTS

A total of 355 patients with TB and other co-morbid conditions accessing the TB services at regional TB center at Qassim comprised the study population. Of the 355 patients, Saudi ethnicity observed in 187 (52.7%) patients compared to non Saudi 168(47.3%) as shown in figure 1. Out of the total non Saudi patients, the Indonesian patients contribute to 74(21%) followed by Indians 39(11%), Nepalese 12(3.4%), Philippines & Bangladesh with 9 cases each (2.5%), and Pakistan 8(2.3%). There

were few patients from other countries like Sudan, Egypt, Jordan, Sri Lanka, Syria, Afghanistan and Morocco (including SAARC & other countries) as shown in figure 2. Among the total number of patients diagnosed with TB, 150(42 %) were males and 205(58 %) were females (table 1) with the majority of participants 154(44%) being in the age group of 16-30 years and 101(28.5%) being in the age group of 31 – 45 years as shown in table No. 2.

Nearly half of these cases 177(49.9%) are pulmonary TB, and the other half were divided between 170(47.9%) were extra-pulmonary cases and 8(2.2%) cases with both pulmonary and extra-pulmonary involvement as shown in table 3.

Patients included in this study with both pulmonary and extra pulmonary TB had various clinical presentations but they had complaints similar to the typical TB case presentation. The majority of patients 278(78.3%) were admitted with fever, 266(74.9%) had loss of appetite, 264(74.4%) had loss of weight, 196(55.2%) complaining of cough with expectoration and 128(36.2%) were presenting with chest pain as shown in figure 3. In addition there were co-morbid conditions associated like Diabetes mellitus in 36 cases (10%), and 12(3.5%) patients were suffering from lung disease and 6(1.7%) suffering from chronic renal failure.

All the cases were treated with Directly Observed Treatment Short course (DOTS) regimen prescribed by World Health Organization. Out of total 355 patients on DOTS, 168 (47.3%) patients were put under CAT I, 10 (2.8%) CAT II and 175 cases (49.3%) CAT III. There were 341(96%) new

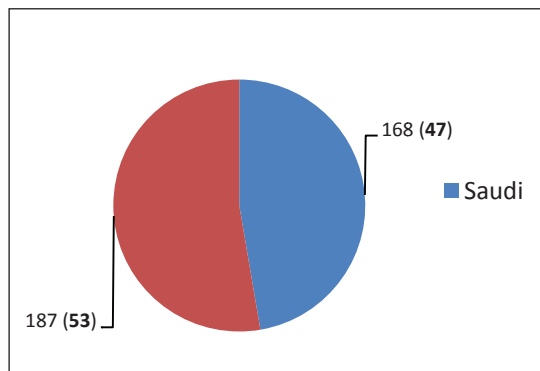


Figure 1. Ethnicity status of participants (percentages within brackets)

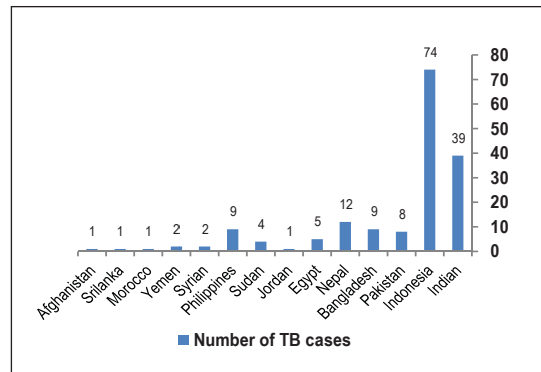


Figure 2. Ethnicity status of non Saudi participants

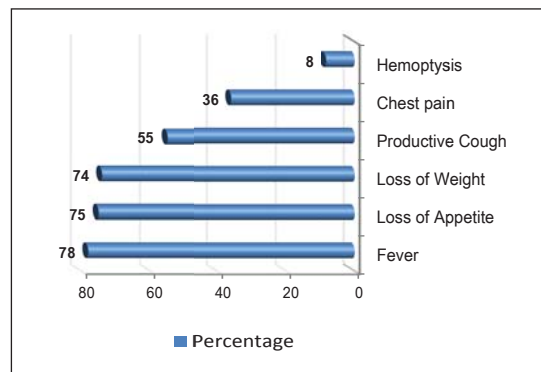


Figure 3. Distribution of common presenting complaints of TB cases

cases and 12(3.4%) relapse cases and 2(0.6%) defaulters among the total patients as shown in table 4.

Table 1. Distribution of study sample according to Sex		
Sex	Number	Percentage
Male	150	42 %
Female	205	58 %
Total	355	100 %

Table 2. Distribution of study sample according to Age		
Age (yrs)	Number	Percentage
0 - 5	8	2.3 %
16-30	154	43.3 %
31-45	101	28.5 %
46-60	36	10.1 %
>60	56	15.8 %
Total	355	100 %

Table 3. Distribution of pulmonary & extra- pulmonary tuberculosis cases

Type of Infection	Number	Percentage
Pulmonary	177	50 %
Extra-Pulmonary	170	48 %
Both pulmonary & extra pulmonary	8	2 %
Total	355	100 %

Table 4. DOTS treatment status of the TB patients included in the study

DOTS Regimen	Number	Percentage
CAT I	168	47.4 %
CAT II	10	2.8 %
CAT III	175	49.3 %
Other	2	0.6 %

DISCUSSION

Over the last few decades, considerable effort has been expended in industrialized countries to control the spread of TB. A lot of these processes were effective initially.¹² In the USA, for instance, the incidence of TB decreased by 6% yearly.¹³ However, TB remains to be a major health concern throughout the world. It is critical for TB control and surveillance programs to address the burden of TB in certain population. Previous reports have indicated that the incidence of smear-positive TB in Saudi Arabia was estimated to be 20 per 100,000 populations.¹⁴ Neighboring countries such as United Arab Emirates have similar rate of TB incidence.

Our study provides population-based data on the TB cases in Qassim region, Saudi Arabia from 2005 to 2009. As shown approximately, 47.3% of TB cases included in this study are attributed for non Saudi patients indicating the important role that migrants play in TB epidemiology in Saudi Arabia.¹⁵ Majority of migrants were from TB-high burden countries, which is one of the important factors that contribute to resurgence of the disease. Therefore, screening migrants from countries endemic for TB is valuable to significantly reduce the spread of infection according the national guidelines.¹⁶ The high prevalence of extra-pulmonary TB in the study in comparison to overall of Saudi Arabia of 29.4% is probably due to the high number of females

immigrating to Saudi Arabia as housemaids from the TB-high burden countries.

Our data suggested that approximately 73% of subjects participated in this study belong to the age group of 16 – 45 years old proving that TB is a disease of economically productive age group among the low socio-economic strata of the society which goes in agreement with previously published study.¹⁷ Studies from South India have also shown that the prevalence of TB was higher in males than females at all ages: it was low in children under 10 years of age, increasing appreciably with age and reaching a peak between 20 and 40 years of age.¹⁸

TB symptoms and clinical presentation of the present study were typical of TB cases with the majority of patients complained of Fever, loss of appetite, loss of weight, and cough with expectoration. Though other studies conducted in Africa & Asia have documented the main presenting complaints were cough, weakness, loss of weight & loss of appetite. In this current study, most of the patients belong to the low socio economic status, who are migrants either working as daily laborers or as house maids. One study from Malawi showed that higher socio-economic status was associated with TB, probably reflecting increased awareness and hence greater likelihood of diagnosis.¹⁹ Studies from China have revealed that TB was negatively correlated with per capita income; good household economic conditions were a protective factor.²⁰⁻²¹

In our study, we found a strong association for TB in patients with chronic disease— there were co-morbid conditions associated like Diabetes mellitus in 36 cases (10%), and 12(3.5%) patients were suffering from lung disease and 6(1.7%) suffering from chronic renal failure. Few studies conducted in India and other places have demonstrated the association of TB with chronic disease like Diabetes, Hypertension & coronary heart disease.²²⁻²⁴ The positive aspect of this study was that doctors working at the Regional Hospital were following the WHO-DOTS regimen for the diagnosis and treatment of even complicated cases of TB.

In conclusion, in the current study, we examined the incidence and the pattern of TB cases registered

in Qassim TB center and the findings of this study revealed the high prevalence of TB among migrants mainly those from Southeast Asia. One of the important handicaps in TB control is late diagnosis. Pulmonary TB patients are often diagnosed many weeks after the onset of symptoms. This diagnostic delay allows for transmission of the disease to many contacts. Emphasis on timely contact tracing and treatment of those with active or latent disease is one of the most important aspects of TB control. Clinicians caring for TB patients complain of defects in this particular area. The National TB program needs to review its strategies, correct defects and improve TB control practices to make TB elimination an achievable goal. Further studies and continued surveillance of the TB infections are required to formulate plans for the effective management of TB.

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