

# The Epidemiological Aspects of Tuberculosis Patients in a Tertiary Care Medical College Hospital of Bangladesh

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## Abstract

**Background and Aims:** To assess the clinical and socio-demographic characteristics of tuberculosis patients in a tertiary care medical college hospital of Bangladesh.

**Methods:** An observational study was conducted over a period of one year from September 2015 to August 2016 in the Outpatient Department of Jahurul Islam Medical College Hospital and Department of Pathology, Jahurul Islam Medical College, Kishoregonj. The inclusion criteria of the study were pulmonary and extra pulmonary tuberculosis cases receiving antitubercular drugs therapy. Primary data from each patient was included in tuberculosis patient profile form such as age, gender, educational level, annual income in taka, occupational status and selected social habits like smoking, alcohol.

**Results:** Out of 112 patients studied, 50 (44.6%) were male and 62 (55.4%) were female. The majority of patients 69 (61.7%) were in the age group of 15-34 years. Annual family income of 78 (69.6%) patients ranged between 36,000-1,50,000 taka. In total 112 patients 43 (38.4%) were illiterate and 36 patients (32.2%) were unemployed. 50% of the patients were smoker. The most common sites involved in extrapulmonary tuberculosis were the lymph nodes (38.2%) followed by the pleura (36.4%). The most common symptoms observed in pulmonary tuberculosis patients were cough with expectoration (96.5%) followed by weight loss (80.7%), fever (73.7%) and loss of appetite (54.4%).

**Conclusion:** Prevalence of infection was noticed between PTB and EPTB with age and it was more common in younger age. However, based on our results TB control programme might usefully target young middle age populations for early diagnosis of TB to decrease TB morbidity and mortality.

**Keywords:** Tuberculosis; Pulmonary tuberculosis; Extra pulmonary tuberculosis

## Introduction

Tuberculosis (TB) remains a major global public health problem [1]. It is estimated that about one-third of the world's population is infected with mycobacterium tuberculosis [2]. After primary infection, TB may reactivate at anytime and anywhere in the body. Recent studies have suggested that the sites of extra-pulmonary tuberculosis (EPTB) may vary according to geographic location and population [3-5]. Clinical manifestations of TB are variable and depend on a number of factors that are related to the microbe, the host and the environment [6]. Tuberculosis (TB) is one of the leading causes of mortality and morbidity among infectious diseases worldwide and has an enormous economic impact on many countries [7]. Bangladesh is one of the highest TB burden countries accounting for one fifth of the global incidence of TB [8]. The disease is more prevalent in the productive age group of 15-54 years which causes an economic burden on the individual's household when they fall sick. The number of TB patients is increasing at a horrifying speed for several reasons. One is the lack of awareness of the disease, which makes patients neglect their symptoms till it is too late. For many they fear that they will surely die of TB and are therefore unable to accept the fact. Another very important reason for hiding the truth is the social stigma attached to TB. Women are thrown out of families, people lose their jobs and children's are thrown out of school because of the irrational belief that TB is fatal and will kill all those who live in proximity to a TB patient. Once removed from the family, these people have a seriously diminished quality of life and die on the streets due to complications of the disease and starvation [9]. Extra pulmonary TB occurs outside the lungs; in lymph nodes and in any organ system even brain and reproductive organs. The bacteria may spread through

lymphatic or haematogenous dissemination. The TB bacteria may remain dormant for years at a particular site before causing the disease and may have a wide variety of clinical manifestations leading to difficulty and delay in its diagnosis [10]. Epidemiological information on TB is required to plan control and prevention strategies and to inform service delivery systems. Assessment of the epidemiological indices within a specific time period can also help planners to focus on the main problems of a community and to assess the efficacy of preventive programs. Given the reasons provided, the aim of present study was to determine the epidemiological and sociodemographic status of TB in a tertiary medical college hospital in Bangladesh.

## Methods

An observational study was conducted over a period of one year from September 2015 to August 2016 in the Outpatient Department of Jahurul Islam Medical College Hospital and Department of Pathology, Jahurul Islam Medical College, Kishoregonj, Bangladesh. A total of 112 patients, who came to outpatient department were interviewed. The

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inclusion criteria of the study were pulmonary and extra pulmonary tuberculosis cases diagnosed on the basis of sputum smear, culture, chest-radiograph, cytological and histopathological examination receiving antitubercular drugs therapy. Patients unwilling to participate in the study were excluded from the study. Informed consent was taken for the study. Patient's informed consent form including information regarding the study was provided to the patients for their understanding about the study and participation. Patient informed consent was written in Bengali language. Primary data from each patient was included in tuberculosis patient profile form such as age, gender, educational level, annual income in taka, occupational status and selected social habits like smoking, alcohol.

### Classification of PTB and EPTB patients

It is well known that lymph node and pleural involvement in TB is a direct extension of the disease from lung parenchyma. Therefore, patients with exclusively intrathoracic involvement (i.e., confined to lung parenchyma, pleura, and intrathoracic lymph nodes) were considered as PTB for the purpose of this analysis. Patients with extension of disease to organs or tissues outside the thorax, including those patients who also had pulmonary involvement, were considered

as EPTB in our analysis. We followed the definitions used in two earlier studies [3,4] for EPTB and PTB patients.

### Results

Out of 112 patients studied, 50(44.6%) were male and 62 (55.4%) were female. The majority of patients 69 (61.7%) were in the age group of 15-34 years (Table 1).

Annual family income of 78 (69.6%) patients ranged between 36,000 tk to 1,50,000 tk. In total 112 patients 43 (38.4%) were illiterate and 36 patients (32.2%) were unemployed. 50% of the patients were smoker. Among them 53.5% had pulmonary tuberculosis (Table 2).

The most common sites involved in extrapulmonary tuberculosis were the lymph nodes (38.2%) followed by the pleura (36.4%). The most common symptoms observed in pulmonary tuberculosis patients were cough with expectoration (96.5%) followed by weight loss (80.7%), fever (73.7%) and loss of appetite (54.4%). Whereas in extrapulmonary tuberculosis patients majority had weight loss (79.6%), fever (67.3%), loss of appetite (61.2%). Both pulmonary and extrapulmonary patients had fever (83.3%) and loss of appetite (66.7%) as major clinical symptom (Table 3).

Characteristics	Number of patients			Total Number of patients (N=112)	Percentage (%)
	Pulmonary (N=57)	Extra pulmonary (N=49)	Pulmonary and Extra pulmonary (N=6)		
<b>Gender</b>					
Male	31	16	3	50	44.6
Female	26	33	3	62	55.4
<b>Age group(years)</b>					
5-14	-	3	1	4	3.6
15-24	17	16	1	34	30.4
25-34	14	19	2	35	31.3
35-44	6	5	-	11	9.8
45-64	16	5	1	22	19.6
>64	4	1	1	6	5.3

Table 1: Age and gender distribution of the study subjects.

Characteristics	Number of patients			Total Number of patients (N=112)	Total Percentage (%)
	Pulmonary (N=57)	Extra pulmonary (N=49)	Pulmonary and Extra pulmonary (N=6)		
<b>Employment status</b>					
Employed	25	19	3	47	41.9
Unemployed	16	18	2	36	32.2
Retired	5	1	-	6	5.3
Student	11	11	1	23	20.6
<b>Social Habits</b>					
Smokers	36	12	8	56	50
Alcoholic	3	2	1	6	5.3
Nonsmokers	20	28	2	50	44.6
<b>Education</b>					
None	23	19	1	43	38.4
Primary	16	13	2	31	27.7
High school	10	7	1	18	16.1
University	8	10	2	20	17.8
<b>Annual family income(Taka)</b>					
36,000-1,00,000	21	18	4	39	34.8
1,01,000-1,50,000	23	15	1	39	34.8
1,51,000-2,00,000	8	12	4	24	21.5
>2,00,000	5	4	1	10	8.9

Table 2: Socio-demography and other characteristics of tuberculosis patients.

Characteristics	Pulmonary (%) (N=57)	Extra pulmonary (%) (N=49)	Pulmonary+Extra pulmonary (%) (N=6)
Cough with expectoration	55 (96.5%)	20 (40.8%)	03 (50%)
Loss of appetite	31 (54.4%)	30 (61.2%)	04 (66.67%)
Fever	42 (73.7%)	33 (67.3%)	05 (83.33%)
sweating	19 (33.3%)	06 (12.2%)	01 (16.67%)
chills	27 (47.4%)	22 (44.9%)	03 (50%)
Fatigue	25 (43.9%)	11 (22.4%)	04 (66.67%)
Weight loss	24 (42.1%)	15 (30.6%)	02 (33.33%)
Chest pain	04 (7.0%)	13 (26.5%)	-
Abdominal pain	19 (33.3%)	11 (22.4%)	03 (50%)
Breathlessness	13 (22.8%)	19 (38.8%)	04 (66.67%)
Swelling	-	16 (32.7%)	-
Body ache	13 (22.8%)	18 (36.7%)	01 (16.67%)

**Table 3:** Clinical presentation of patients with pulmonary and extra pulmonary tuberculosis.

## Discussion

The TB incidence is one of the most important surveillance indicators in public health. Pulmonary tuberculosis is an air born infectious disease caused by *Mycobacterium tuberculosis* and is a major cause of morbidity and mortality particularly in developing countries. In this study a total of 112 diagnosed TB patients undergoing treatment were studied. Of these 50 (44.6%) were males and 62 (55.4%) were females, which suggests that the number of female patients are more compared to male patients which is similar to a study conducted by Othman et al. [11]. This could be because women often face some obstacles such as high female illiteracy, ill health with lower immune status, massive house hold work load and economic dependency that allow them limited access to health care. This gender differences observed in our study may be a consequence of gender differences in both exposures to TB infection and prevalence of susceptibility risk factors (e.g., smoking). Of the 112 tuberculosis patients evaluated, 69 (61.7%) patients were within the age group of 15-34 years. This shows that TB mainly infects the productive age group constituting to a strong economic burden and affect their working potentiality. These could be due to differences in prevalence of host-related factors or important co-exposures like smoking and tobacco exposure. It should be noted that reproductive age group has strong implications in tuberculosis control strategies because of higher chances of mother to child transmission and higher probability of complications because of attendant antenatal and postnatal morbidity. A large number of study populations were illiterate 43 (38.4%). As level of education is an important factor in with knowledge about disease, educational status of the community is one of the key factors for the success or failure of the treatment in tuberculosis. In the present study, 41.9% were employed. The educational level and employment status of this study was found consistent with the studies from Brazil conducted by Steffen et al. [12]. Only 10 (8.9%) of the patients had annual family income more than 2 lacs taka which shows tuberculosis affects middle class and lower class economic population group. Unemployment, lower Educational Level, unhealthy living environment and overcrowding living condition may be the reason for TB in lower socio economic class people. This study show 56 (50%) of the patients are smoker suggesting smoking is one of the main risk factor for TB. This is consistent with a meta-analysis which reported that smoking is a risk factor for TB infection and for pulmonary TB disease. Furthermore, behavioural factors especially cigarette smoking and alcohol use have negative effect on TB treatment. Cigarette smoking is known to damage the lungs and suppress the individual adaptive immune responses affecting patient's response to TB treatment. In our study 50.9% patients had pulmonary tuberculosis, 43.7% patients had extra pulmonary tuberculosis and 5.4% were both

pulmonary and extrapulmonary tuberculosis. Pulmonary tuberculosis was more common than extra pulmonary tuberculosis. This study also show pulmonary tuberculosis is more common in men (54.4%) than in women (45.6%). The same result was also observed in a study by Noertjojo et al. [13]. Recent studies have suggested that the sites of extrapulmonary tuberculosis may vary according to geographic location and population. It is well known that lymph node and pleural involvement in TB is a direct extension of the disease from lung parenchyma [14]. In this study the most common sites involved in extrapulmonary tuberculosis were the lymph nodes (38.2%) followed by the pleura (36.4%) which is consistent with the study from Nepal conducted by Sreeramareddy et al. [15]. The signs and symptoms of pulmonary TB are typical and known (cough and sputum) whereas extra pulmonary TB is difficult to identify not only by the patients but also by the clinicians themselves [16]. In this study 96.5% of patients of pulmonary TB and 40.8% patients of extrapulmonary TB has cough with expectoration which was also observed in similar study [15].

## Conclusion

Our study concludes that majority of the tuberculosis patients are within the economically productive age group ranged between 15-34 years. Females are the majority of the patients with extra pulmonary tuberculosis while pulmonary tuberculosis predominantly occurred in men. The most common sites of involvement were the lymph nodes followed by pleura, spine and genitourinary tract. Based on this results TB control programme might usefully target young and female populations for early diagnosis to decrease tuberculosis morbidity and mortality.

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