

## COMPARISON OF CLINICO-SOCIAL PROFILE OF PULMONARY AND EXTRA PULMONARY TUBERCULOSIS IN TERTIARY CARE HOSPITAL IN A RURAL AREA: A RETROSPECTIVE STUDY

### Community Medicine

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### ABSTRACT

**BACKGROUND AND OBJECTIVES:** The burden of tuberculosis (TB) in India is the highest accounting for 26% of the global incidence. A total of 1.4 million people died from TB in 2019 (including 208 000 people with HIV). India accounts for a fourth of the global burden of TB and 29% of global mortality. Therefore, we carried out this study to compare demographic, lifestyle and clinical characteristic between pulmonary TB (PTB) and extrapulmonary TB (EPTB).

**MATERIALS AND METHODOLOGY:** A retrospective analysis was carried of 348 patients diagnosed in DOTS centre, Pravara Rural Hospital, Loni. Characteristics of demographic and clinical characteristics were obtained from medical case records.

**RESULTS:** Among the 348 cases, 71.3% were PTB and 28.7% were EPTB including, pleural (36%), meningeal (27%) and lymphatic (20%) cases. The male to female ratio in PTB and EPTB are 1.99 and 1.22 respectively. EPTB was more common at younger age (<25 years). Tobacco addiction (10.9%), diabetes mellitus (4.03%), HIV positivity (12.1%) and history of contact with Tb patients (17.7%) were more likely to be associated with PTB.

**CONCLUSION:** Increased awareness of the risk factors may facilitate early case finding and better management outcomes for these patients.

### KEYWORDS

Tuberculosis, Pulmonary, Extrapulmonary, Co-morbidity, Risk factors.

### INTRODUCTION

Tuberculosis is an airborne disease caused by infection with *Mycobacterium tuberculosis* (MTB), which typically affects the lungs (pulmonary tuberculosis (PTB)). However, it also may affect any other organs of the body, which is known as extrapulmonary tuberculosis (EPTB)<sup>1</sup>.

Tuberculosis (TB) is a communicable disease that is a major cause of ill health, one of the top 10 causes of death worldwide and the leading cause of death from a single infectious agent (ranking above HIV/AIDS)<sup>2</sup>. The burden of tuberculosis (TB) in India is the highest accounting for 26% of the global incidence. Annually, an estimated 28 lakh TB cases occur in India. A total of 1.4 million people died from TB in 2019 (including 208 000 people with HIV). India accounts for a fourth of the global burden of TB and 29% of global mortality<sup>3</sup>.

Exogenous factors play a key role in accentuating the progression from exposure to infection among which the bacillary load in the sputum and the proximity of an individual to an infectious TB case are key factors<sup>4</sup>.

TB comorbidity with noncommunicable diseases (NCDs) and other communicable diseases (CDs) is highly prevalent in TB endemic regions of the world.<sup>5</sup> Population attributable TB risk estimates for diabetes, malnutrition, smoking, excessive alcohol use, and HIV infection are high<sup>6</sup>. The burden of EPTB is high ranging from 15-20 per cent of all TB cases in HIV-negative patients, while in HIV-positive people, it accounts for 40-50 per cent of new TB cases. The estimated incidence of TB in India was 2.1 million cases in 2013, 16 per cent of which were new EPTB cases, equating to 336,000 people with EPTB<sup>7</sup>.

India is committed to achieve the SDG goal of eliminating TB in the country by 2025. Consolidating a series of rapid and progressive advancements in RNTCP from 2016 onward, and with Government of India's commitment to achieve the END TB targets 5 years earlier, RNTCP was re-named as the National TB Elimination Program. The change came into effect from 1st January 2020<sup>8</sup>.

### METHODOLOGY

#### STUDY DESIGN

This was a retrospective record based study done at the DMC cum

DOTS Centre of Pravara Rural Hospital (PRH), Loni. The diagnosis of Tuberculosis was done clinically, radiologically or pathologically. At PRH, patients diagnosed with tuberculosis were referred to the DOTS clinic for treatment according to NTEP guidelines.

### DATA COLLECTION

A total number of 348 TB patients registered at the DOTS clinic between 1<sup>st</sup> October, 2019 and 30<sup>th</sup> September, 2020 were included in this study. Their data was obtained from patient record sheets of hospital, lab register, treatment cards and referral registers of RNTCP. For each patient, demographic profile and clinical characteristics were recorded. Demographic information like age and gender were taken. Clinical characteristics recorded were site of the disease, presence of co-morbidity (diabetes mellitus and HIV status), site of extrapulmonary tuberculosis, habit of tobacco chewing and/or smoking, previous history of treatment of TB and history of contact with TB patients.

### CLASSIFICATION OF PTB AND EPTB

**PTB:** According to Revised National Tuberculosis Control Program (RNTCP), diagnosis of pulmonary tuberculosis (TB) in India requires examination of two sputum samples collected over 2 days, that is, "spot" and next day "morning" samples by Zeihl Nielssen staining for acid fast bacteria. Chest radiographs were also used to support the diagnosis<sup>9</sup>. Cartridge Based-Nucleic Acid Amplification Test (CB-NAAT) was employed if there is high suspicion of TB and sputum smears negative and for drug susceptibility testing.

**EPTB:** The extrapulmonary TB is TB outside lungs which include sites most commonly involved are lymph nodes, pleura, genitourinary tract, bones and joints, meninges, peritoneum, and pericardium<sup>10</sup>. Diagnosis of EPTB was done using FNAC, CT/MRI scan, biochemical analysis of pleural/ascetic/cerebrospinal fluids or histopathological analysis.

### STATISTICAL ANALYSIS

To describe the characteristics of the study population, Microsoft Excel 2010 (Microsoft Corporation, Redmond, Washington) was used. Demographic variables, lifestyle factors and clinical characteristics were compared between EPTB and PTB groups.

## RESULTS

A total of 348 cases of TB registered at the DOTS center of PRH were included in this study. Of which 248 (71.3%) were classified as Pulmonary TB (PTB) and 100 (28.7%) were classified as Extrapulmonary TB (EPTB)

## DEMOGRAPHIC CHARACTERISTICS

The male to female ratio for PTB was found out to be 1.99 (165/83) and for EPTB was 1.22 (55/45). The age distribution of the cases of PTB and EPTB was done and it was found out that EPTB occurs in younger age group. (Table 1)

## LIFESTYLE FACTORS

The proportion of cases having history of contact with TB patients was more in PTB. The proportion of patients who were tobacco smokers and/or chewers was more in PTB. About 1.6% patients of PTB were living in urban slum. 0.4% cases of PTB was a health care worker. (Table 2)

## CLINICAL CHARACTERISTICS

4.03% patients of PTB were suffering from diabetes mellitus. HIV positivity was 12.1% in case of PTB and 7% in case of EPTB. The proportion of cases of PTB previously treated for TB was higher than EPTB (8.47% and 2% respectively). (Table 3)

## SITES OF EPTB

The most common site of EPTB was pleura (36%) followed by meninges (27%) and lymph node (20%). Bony involvement was found in 10% cases (including Potts spine). 4% of the cases had abdominal TB. Other sites included were skin (2%) and eye (1%). (Figure 1).

## DISCUSSION

In our study, it was found out that the female gender and younger age are independent risk factors for EPTB. History of contact with TB patients, previous history of treatment of tuberculosis, diabetes mellitus and HIV positive was more in PTB.

## MALE TO FEMALE RATIO

Other studies done in India, Nepal, USA, Turkey, Ghana and Qatar showed more cases in males as compared to females. In these studies, it was showed that EPTB has more female preponderance<sup>11-15</sup>. Younger age group is also an independent risk factor for EPTB was confirmed by a study done in Nepal<sup>12</sup>. These findings of studies done in developed and developing countries confirm our observations.

## LIFESTYLE FACTORS

Study done in Nepal showed that the proportion of patients having history of contact with other cases of tuberculosis is more in PTB than in EPTB<sup>11</sup>. Other lifestyle disorders like diabetes may also influence TB outcomes and need to be managed actively at community level.<sup>16</sup> Same findings were noted in a study done in Qatar<sup>17</sup>.

## CLINICAL CHARACTERISTICS

In our study, the proportion of cases suffering from diabetes mellitus was more in PTB than in EPTB in congruence with studies done in developing countries like India, Qatar and Nepal while a study done in developed country like Turkey, it showed that the proportion of patients suffering from diabetes mellitus was more in EPTB<sup>10,11,13,15</sup>. A study in India, confirmed our findings that the proportion of HIV positive patients is more in case of PTB<sup>10</sup>. While a study done in Nepal and USA showed that there is equal proportion of HIV positive cases in PTB and EPTB<sup>11,12</sup>. The study done in Nepal also confirmed our findings that the proportion of patients with history of treatment with TB was more in cases of PTB<sup>1</sup>.

## SITES OF EPTB

In our study, it was found out that pleura is the most common site of extrapulmonary involvement followed by meninges and lymph nodes. This finding is confirmed by a study done in India<sup>10</sup>. However, in developed countries like USA and Turkey, the most common site of EPTB was lymph node<sup>13,14</sup>. Training of health workers to check for extra-pulmonary TB has been found to be equally important.<sup>18</sup>

## LIMITATIONS

As this study was done in a tertiary care center, hence the cases are not representative of the total population. The cases presenting to PRH are in moderate and serious conditions. There is limited information regarding the co-morbidity of the patients. Only the diabetes and HIV

status is noted at the DOTS center. The data regarding behavioral and socio-economic factors is not properly available. Tobacco smoking and chewing cannot be differentiated and data regarding alcohol use and nutritional status is not available.

## CONCLUSION

Younger age group and female gender are independent risk factors for EPTB. The national tuberculosis control programmes like NTEP should target this specific population.

## TABLES AND FIGURES

**TABLE 1: COMPARISON OF PTB AND EPTB ACCORDING TO DEMOGRAPHY**

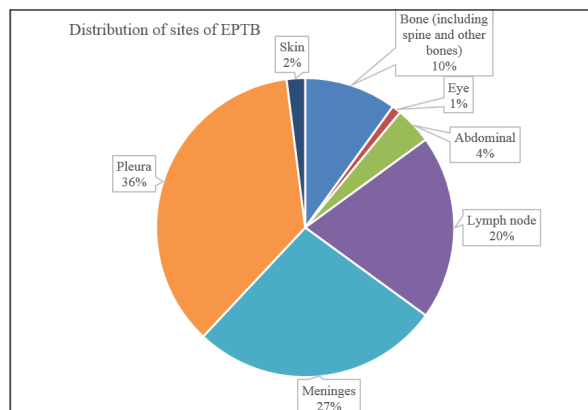
| Characteristics | PTB (n=248) | EPTB (n=100) |
|-----------------|-------------|--------------|
| Age group       | <25 years   | 102 (41.1%)  |
|                 | 25-50 years | 100 (40.3%)  |
|                 | >50 years   | 46 (18.6%)   |
| Gender          | Male        | 165 (66.5%)  |
|                 | Female      | 83 (33.5%)   |
|                 | Ratio       | 1.99         |

**TABLE 2: COMPARISON OF PTB AND EPTB ACCORDING TO LIFESTYLE FACTORS**

| Factors                             | PTB (n=248) | EPTB (n=100) |
|-------------------------------------|-------------|--------------|
| History of contact with TB patients | 44 (17.7%)  | 12 (12%)     |
| Tobacco chewing and/or smoking      | 27 (10.9%)  | 6 (6%)       |
| Urban slum                          | 4 (1.6%)    | -            |
| Health care worker                  | 1 (0.4%)    | -            |

**TABLE 3: COMPARISON OF PTB AND EPTB ACCORDING TO CLINICAL CHARACTERISTICS**

| Characteristics                        | PTB (n=248) | EPTB (n=100) |
|----------------------------------------|-------------|--------------|
| Diabetes mellitus                      | 10 (4.03%)  | 3 (3%)       |
| HIV positive                           | 30 (12.1%)  | 7 (7%)       |
| Past history of tuberculosis treatment | 21 (8.47%)  | 2 (2%)       |



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