

## Clinical profile of patients with musculoskeletal Tuberculosis visiting a tertiary care centre in India

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**Abstract**— Musculoskeletal TB comprises around 10 to 30% of all EPTB cases. Even though skeletal tuberculosis is an important debilitating disease, the literature in statistical data regarding the socio-demographic distribution and clinical presentation of disease is very scarce. Our objective is to study the socio-demographic and clinical profile of musculoskeletal tuberculosis patients reaching the Orthopaedics Department in a tertiary care hospital in India. 186 patients with musculoskeletal tuberculosis who have completed treatment were called for a follow up and data were collected, tabulated and represented in various charts and diagrams, and analysed. Maximum proportion (26%) of the patients were belonging to 40-49 age group, with a mean age of 49.6 years. Maximum number of patients were belonging to upper lower class (102 out of 186). Spine was the commonest site involved among the 138 cases. 100% patients had pain as the presenting complaint and other complaints were not consistent. Only 16% of the patients had history of pulmonary tuberculosis and history of contact with tuberculosis case was present in 25% cases. The study reinforces the acquaintance of tuberculosis with low socioeconomic status and to some extent the debilitating diseases. It often has an atypical presentation leading to delay in diagnosis.

**Keywords**— Musculoskeletal Tuberculosis, Pott's disease, socioeconomic status

### 1 Introduction

Tuberculosis is a major cause of suffering and death since time immemorial. Tuberculosis is caused by mycobacterium tuberculosis complex which is around 60 species. Among them mycobacterium tuberculosis, (most common), Mycobacterium bovis, mycobacterium microti, and Mycobacterium africanum are known to affect humans. The primary site of infection can be lungs, lymph nodes of mediastinum, mesentery, gastrointestinal tract, genitourinary system or any other viscera. Musculoskeletal tuberculosis (TB) is the third most common type of extrapulmonary TB after pleural and lymphatic disease. Tuberculosis causes ill-health among millions of people each year and ranks as the second leading cause of death from an infectious disease worldwide, after

the human immunodeficiency virus. The burden of TB is considerably greater in developing countries compared to the developed ones. Geographically, the burden of TB is highest in Asia and Africa. About 60% of cases are in the South-East Asia and Western Pacific regions. India and China together account for almost 40% of the world's TB cases. The African Region has 24% of the world's cases and the highest rates of cases and deaths per capita<sup>1</sup>. The present threat of tuberculosis is in terms of extra-pulmonary manifestations of disease, with increasing resistance seen to conventional antituberculous drugs (multi-drug-resistant TB) and co-infection with Human Immunodeficiency (HIV) virus<sup>2</sup>. With a population of about 1210 million, India, the second most populous country in the world, ranks first among countries with the highest burdens of tuberculosis in the world. India has more new tuberculosis cases annually than any other country. Musculoskeletal TB (MSKTB) comprises around 10 to 30% of all EPTB cases<sup>3</sup>. Diagnosis of MSKTB often becomes challenging due to its rarity at presentation and its often-indolent presentation without typical features of fever and other constitutional symptoms characteristic of TB or other infections. Furthermore, it is complicated by the fact that tissue sample may not always be accessible in case of skeletal TB, and less than 50% cases of MSKTB have features of present or past PTB<sup>[2]</sup>. MSKTB is acquired hematogenously, or less commonly, by direct inoculation through trauma or local spread from infected surrounding structures such as lymph nodes. Clinically, MSKTB most commonly presents as tubercular spondylitis or Pott's spine (50–60%). Other forms of presentation are osteomyelitis, septic arthritis, soft tissue abscesses, and rarely, reactive arthritis (Poncet's disease). Even though skeletal tuberculosis is an important debilitating disease, the literature in statistical data regarding the incidence and prevalence of disease is very scarce. This study is carried out to assess the clinical profile of musculoskeletal tuberculosis and the demographic, person and illness related factors in contracting disease, among the patients reaching the the Department of Orthopaedics in a tertiary care hospital in South India. (Government Medical College, Kozhikode)

## 2 Materials and Methods

After approval from Institutional Ethics Committee, details of patients with Musculoskeletal tuberculosis treated using alternate day DOTS regimen in our institution were collected from TB centre (NTEP-ICD), Department of Pulmonary Medicine, Government Medical College, Kozhikode, Kerala, India, contacted and were asked to review in the Department of Orthopaedics for follow up.

Inclusion criteria:

1. All patients diagnosed to have Tuberculosis of Musculo skeletal system, admitted under department of orthopaedics and registered in institute RNTCP registry from JAN 2015 to DEC 2020.
2. Patients whose diagnosis was confirmed with bacteriological examination.
3. Patients who are available for follow-up after completion of ATT.

#### 4. Patients who give informed consent.

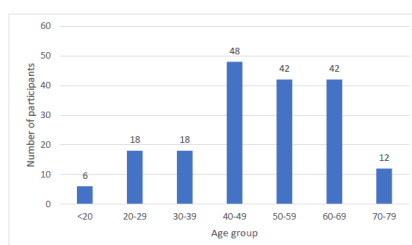
Exclusion criteria:

1. Patients who do not give informed consent.
2. Patients who cannot be traced with details from institute TB registry.
3. Patients with no bacteriological confirmation of diagnosis.

All patients diagnosed with Musculoskeletal Tuberculosis and fulfilling the inclusion and exclusion criteria were enrolled. After getting permission from department of Pulmonary medicine, details of patients with musculoskeletal tuberculosis were collected from the institute TB registry. 186 Patients were called for a follow up. Case sheets along with the investigation details were taken from the medical record library and were examined and confirmed. With an informed written consent, a pre-prepared questionnaire is used to collect epidemiological and clinical details directly from patients and analysed with the help of a computer program. Data collected was tabulated in excel software and analysis was done using SPSS software SPSS version 16. Tabulated data were represented in charts and diagrams. Percentage analysis of individual variables was done to find the epidemiologic distribution of cases.

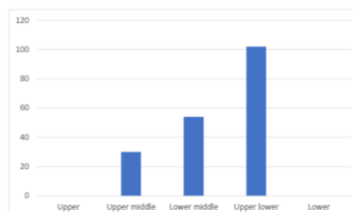
### 3 Results

The age of the participants was ranging from 16 to 77 with a mean (SD) age of 49.6 (14.98) Maximum proportion of the patients belonged to 40-49 age group.



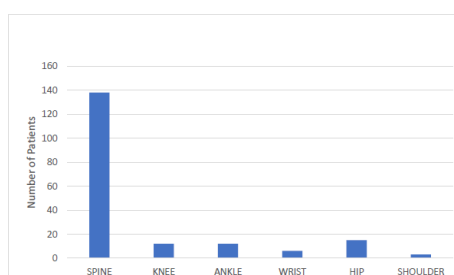
**Graph 1.** Age distribution of study participants

- Maximum number of patients belonged to Upper lower class and there were no patients belonging to Upper and Lower class.

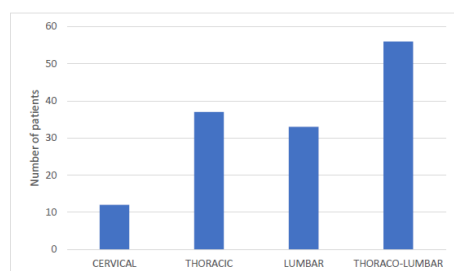


**Graph 2.** Distribution of participants based on Socio-economic status

- In majority of the patients (74%), spine was affected of which 57% were in the Thoraco-Lumar region

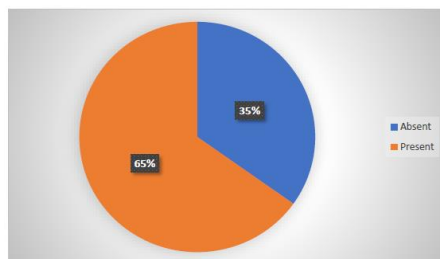


**Graph 3.** Distribution based on anatomic region affected



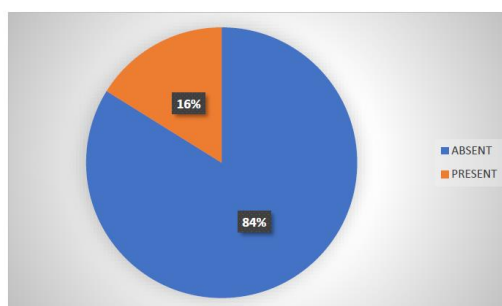
**Graph 4.** Distribution based on region of spine affected

- 86 out of 138 spine affected cases had neurological deficits, at the time presentation.



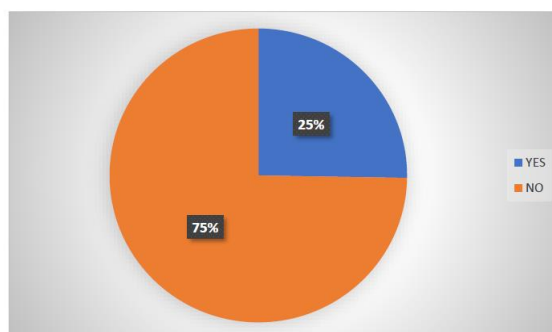
**Graph 5.** Presence of neurological deficits at the time of presentation

- 100% had pain as a symptom at presentation. 108 patients had fever. 102 patients had weight loss and 96 patients had loss of appetite.
- Out of 186 study participants, only 30 patients had history of pulmonary tuberculosis



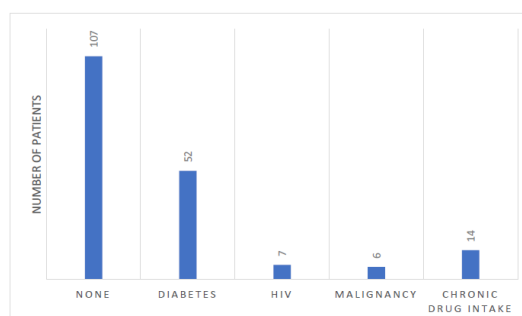
**Graph 6.** Distribution based on history of Pulmonary TB

- 47 out of 186 patients had history of contact with tuberculosis case.



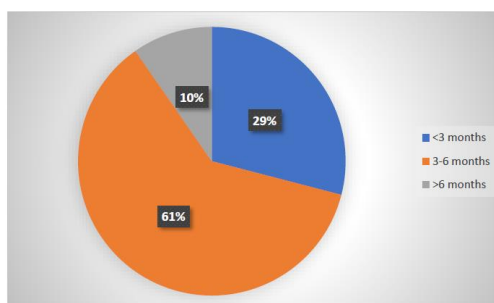
**Graph 7.** History of contact with tuberculosis patients

- 7.5% of the patients had chronic drug intake including immunosuppressants and steroids, 27.9 % had diabetics, 3.2% had malignancy and 3.8% had HIV. But the majority 57.5% had no associated co morbidities.



**Graph 8.** History of contact with tuberculosis patients

- 30 out of 186 patients were reported to be having multi drug resistance.
- In most of the patients, diagnosis was done in 3-6 months with an average of 4.56 months.



**Graph 9.** Distribution based on duration of illness before starting ATT

## 4 Discussion

India accounts for one-fourth of the world's TB burden, with an annual incidence of 28 lakhs and mortality of 4.8 lakhs<sup>4</sup>. The majority of extra- pulmonary tuberculosis in-

volves the pleura, musculoskeletal and lymphatic systems. Musculoskeletal TB comprises around 10 to 30% of all EPTB cases<sup>1,3</sup>. Diagnosis of MSKTB often becomes challenging due to its rarity at presentation and its often-indolent presentation without typical features of fever and other constitutional symptoms characteristic of TB or other infections. Furthermore, it is complicated by the fact that tissue sample may not be always be accessible in case of skeletal TB, and less than 50% cases of MSKTB have features of present or past PTB.

The distribution of age and site of musculoskeletal TB has been previously studied. In a retrospective and observational study conducted in a tertiary area with the highest prevalence of TB worldwide, three peaks in the first, third, and sixth decade of life were found<sup>5</sup>. However, some reports highlighted a bimodal age distribution<sup>6</sup>. In Assam clinical study 1999, the majority of the cases (60.29%) were in the first 3 decades of life<sup>7</sup>. An analysis of 194 patients with osteoarticular TB in Meerut, India, reported that the highest incidence was in the second decade (30%), followed by the first (22%), the third (18%), and then the fourth decade (14%)<sup>8</sup>. In our study, the mean age was 44 years and the age of the participants was ranging from 16 to 77 with a mean (SD) age of 49.6 (14.98). We did not find an age peak in childhood or in the advanced age group. Maximum proportion of the patients belonged to 40-49 age group. Also, it was found that the disease is almost equally distributed among males (52%) and females (48%).

In the literature, most of the TB cases present with spine involvement. More than 10% of patients with extra-pulmonary TB have skeletal involvement<sup>9</sup>. The most common form of skeletal TB is the Pott's disease, comprising approximately half of musculoskeletal TB cases, and followed by TB arthritis and extra-spinal TB osteomyelitis<sup>[10]</sup>. In the retrospective study done by Michael et al.<sup>5</sup>, 78% of the cases had spine TB while the remaining 21.6% had extra-spinal diseases, comprising hip, knee, foot/ankle, shoulder, elbow, wrist, and others. Likewise, in our study, the prevalent anatomically affected location was the spine (138 of 186 patients; 74%) followed by hip (8%), knee (6%) and ankle (6%), and few cases of wrist and shoulder. In a study done by A Sharma and H S Chhabra, it was found that among 356 involved vertebrae, thoracic levels (T1-10) were most commonly affected in 163 (45.78%) followed by thoracolumbar (T11-L2) vertebrae in 98 (27.52%)<sup>11</sup>. In our study, most frequent site of tuberculosis in spine was the thoracolumbar junction. The incidence decreases above and below this level. Out of 186 patients, lumbar spine was involved in 33 patients, thoracic spine in 37 patients, thoracolumbar junction in 56 and 12 patients had cervical spine involvement. 86 out of 138 spine affected cases had neurological deficits, at the time presentation.

Educational status, occupation, monthly income and working environment seems to have predisposing role in getting skeletal tuberculosis, and there is high risk of getting skeletal tuberculosis in crowded environments and low socioeconomic strata of community. In study done by Dr.Sujith Thampy et.al<sup>12</sup>. They observed that 51.6% of cases had monthly income below 5000 and 31.5% between 5000 and 10,000. They also observed that below 10th standard education group shows maximum number of cases, 47.6%, and as education status increases the occurrence rates decreases. In their study, 43.5% of patients were manual labourers again directing the increased occurrence rates in poor socioeconomic conditions. From our study using Modified Kuppu swami scale, it was observed that most of the patients belonged to upper lower class

(102 out of 186) followed by lower middle and upper middle. There were no participants belonging to Lower class which may be attributed to very limited number of individuals from Lower class in the study population.

Past history of pulmonary tuberculosis was present only for 16% patients which signifies that previous history of pulmonary tuberculosis is not so important in pathogenesis of musculoskeletal tuberculosis, in our study population. Contact history was there for 25%. 28% of the study participants were diabetics. The role of HIV and other debilitating illness are not so evident in our study population, may be due to the particular sample population.

The delays in the diagnosis of musculoskeletal TB have been sufficiently presented in literature<sup>13</sup>. In majority of the patients in our study, the diagnosis was made in 3-6 months (61%) with an average time of 4.56 months. This may be due to the patients' uncertain histories, perhaps complicated by inaccurate stories of irrelevant trauma, and lack of presence of a concomitant pulmonary involvement. In our study, 100% of the cases had pain as the complaint. Therefore, these patients have been investigated in multiple clinics for a long time. The occurrence of other complaints like fever, weight loss and loss of appetite were not consistent.

Out of 186 patients, 22 completed treatment with 6 months of ATT regimen. 152 patients completed treatment between 7 to 12 months. 12 of them took treatment for more than 12 months. There is difference of opinion regarding duration of treatment for spinal TB. The British Thoracic Society recommends 6 months duration for spine unless there is central nervous system involvement where they recommend 12 months therapy. Upadhyay SS, Saji M and Yau A C in their study in cases of spinal tuberculosis have reported comparable radiological results with 6, 9 and 18 months of chemotherapy<sup>14</sup>. In a study done among musculoskeletal tuberculosis patients by Vikram Sethi et al, they found that 26.8% cases are multi drug resistant<sup>15</sup>. A study among spinal tuberculosis patients by Sharma et al. found 16.6 % cases had drug resistance to at least one anti tubercular drug and among these 78.3% cases were multi drug resistant<sup>16</sup>. In our study, 30 out of 186(19%) had multi drug resistance.

## 5 Conclusion

From our study, it was found that musculoskeletal tuberculosis is common among middle age people, unlike the results from the previous studies and the sex distribution was found equal.

The study reinforces the existence of relationship between tuberculosis and low socioeconomic status, and to some extent the comorbid diseases.

Pain is the only symptom that is consistent with all the cases and most of these cases must have evaluated for pain for long. This atypical presentation may be a reason for the delay in diagnosis, which is described in previous studies as well. Early diagnosis needs strong suspicion and thorough examination, especially when the patient has comorbidities like diabetes. History of pulmonary tuberculosis is not an important fac-

tor in disease pathogenesis. But significant numbers with history of contact with tuberculosis patients implies the importance of awareness to be given for the households of patients with tuberculosis.

Spinal tuberculosis remains as the most common site of skeletal tuberculosis, like the results from literature. A large proportion of spinal tuberculosis patients have neurological deficits at presentation. Delay in diagnosis may be a reason for this. Like the results from similar studies, in our study, also incidence of multi drug resistance is high and it signifies the need of drug sensitivity testing in musculoskeletal tuberculosis cases.

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