

## Original Research Article

# A study of extra-pulmonary tuberculosis and its outcome

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### ABSTRACT

**Background:** Pulmonary tuberculosis being the predominant manifestation of the disease extra-pulmonary sites can also involve as a result of dissemination from a chief focus. Extra-pulmonary tuberculosis is more common in HIV cases. The present study aims to determine the presentation and outcome of patients with extra-pulmonary tuberculosis treated with DOTS and to assess any difference in outcome of treatment in HIV positive extra-pulmonary tuberculosis.

**Methods:** Data was collected from cases of tuberculosis patients diagnosed and treated under DOTS at Sri Siddhartha Medical College for the period of one year (during 2015). We evaluated extra-pulmonary cases and recorded sites of involvement in order of frequency. We also studied treatment outcome by recording as per definitions given by the WHO and also evaluated any difference in outcome of extra-pulmonary tuberculosis disease with HIV co-infection.

**Results:** Extra-pulmonary cases accounted for 30.5% of total TB cases. Among 224 cases of extra-pulmonary TB studied, 136 (60.7%) were males and 88 (39.3%) were females. Most common site of extra-pulmonary tuberculosis was pleura (29.9%) followed by meninges (22.5%), abdomen (19.6%) and lymph node (10.7%) tuberculosis. Among these patients 82.2% completed treatment, 7.5% were defaulted, 9.9% died and 0.4% treatment failure. The most common reason for default was irregular treatment (29.5%) followed by alcohol abuse (23.5%). Among 8 HIV reactive patients, 5 patients completed treatment and the remaining 3 patients died during the course of treatment.

**Conclusions:** Extra-pulmonary Tuberculosis accounts for 30.5% of the total cases studied. Pleura is most common site of extra-pulmonary TB in our study. Treatment irregularities and alcohol abuse are the two most common reasons for default. Co-infection with HIV seems to have a poor outcome on patients with extra-pulmonary TB and needs to be studied in large number of samples.

**Keywords:** DOTS, Extra-pulmonary tuberculosis, HIV co-infection, TB, WHO

### INTRODUCTION

Tuberculosis is primarily a disease of the lungs but can affect almost any organ in the body. The term extra-pulmonary tuberculosis is referred to describe the occurrence of TB at sites other than the lung. The most common sites of extra-pulmonary tuberculosis are lymph nodes, genitourinary tract, pleura, bones and joints, meninges and the central nervous system, peritoneum and other abdominal organs.<sup>1</sup> Tuberculosis also exists in a

disseminated (miliary) form, with a general bacteraemia spreading the infection throughout the body.<sup>2</sup>

In 2014, there were an estimated 9.6 million incident cases of TB (range, 9.1 million - 10.0 million) globally, equivalent to 133 cases per 1 lakh population. The absolute number of incident cases is falling slowly, at an average rate of 1.5% per year 2000–2014 and 2.1% between 2013 and 2014. The cumulative reduction in the TB incidence rate from 2000–2014 was 18%. Most of the estimated number of cases in 2014 occurred in Asia

(58%) and the African region (28%); smaller proportions of cases occurred in the eastern mediterranean region (8%), the European region (3%) and America (3%). The six countries that stand out as having the largest number of incident cases in 2014 were India, Indonesia, China, Nigeria, Pakistan and South Africa. India, Indonesia and China alone accounted for a combined total of 43% of global cases in 2014. The 9.6 million incident TB cases in 2014 included 1.1 million-1.3 million (11-13%) among people living with HIV. The proportion of TB cases co-infected with HIV was highest in countries in the African Region. Overall, 32% of TB cases were estimated to be co-infected with HIV in this region, which accounted for 74% of TB cases among people living with HIV worldwide. In parts of southern Africa, more than 50% of TB cases were co-infected with HIV.<sup>3</sup>

Although pulmonary tuberculosis is the most common presentation of tuberculosis disease, it can involve any organ in the body. Extra pulmonary tuberculosis (EPTB) is defined as the isolated occurrence of TB in any part of the body other than lungs. Mycobacteria may spread to any organ of the body through lymphatic or haematogenous dissemination and lie dormant for years at a particular site before causing disease. Manifestations may relate to the system involved, or simply as prolonged fever and nonspecific systemic symptoms. Hence diagnosis may be elusive and is usually delayed. The proportion of EPTB among all TB cases varies from country to country. The extra-pulmonary manifestation of TB is prevalent in 10-34% of non-HIV cases while it occurs in 50-70% of patients co-infected with HIV.<sup>4</sup> Tuberculous lymphadenitis is the most common form of extra-pulmonary tuberculosis and cervical lymph nodes are most frequently involved group among peripheral lymph nodes.<sup>5</sup>

Extra-pulmonary TB is often perceived more as a clinical peculiarity than a public health problem. Since extra-pulmonary TB does not contribute significantly to the transmission of the disease, probably it is not given high priority on the public health agenda.<sup>6,7</sup> Patients with extra-pulmonary TB do not receive specific attention in international TB control strategies.<sup>8,9</sup> However, extra-pulmonary TB contributes significantly to TB-related

morbidity and can cause complications, sequelae and disabilities.<sup>10-13</sup>

Therefore from a public health perspective, there is a need to address this group of patients, as they do contribute to the total burden of disease and they do have a significant impact on available resources of national health systems.

## METHODS

Data was collected from cases of extra-pulmonary TB diagnosed in Sri Siddhartha Medical College Hospital and Research centre, Tumakuru, Karnataka, India in the year 2015 who was treated under directly observed short course chemotherapy (DOTS). Demography of these patients was noted and extra pulmonary site of infection studies and recorded in order. Treatment outcome was evaluated as cured, completed treatment, defaulted, failed, or died based on the definitions given by the WHO.

### Inclusion criteria

This study includes all cases of extra-pulmonary TB of all age groups and both sexes treated at our centre by DOTS.

### Exclusion criteria

Includes any cases of pulmonary TB. The study was conducted after obtaining ethical clearance from institutional ethical committee. The statistical analysis was done by using descriptive analysis.

## RESULTS

Overall 2126 suspected cases of tuberculosis were analyzed at our site during the year 2015. Among them 733 cases of TB diagnosed. They are further classified as sputum positive pulmonary TB (n = 456), sputum negative pulmonary TB (n = 53) and extra-pulmonary TB (n = 224). Extra-pulmonary cases accounted for 30.5% of total TB cases (Table 1).

**Table 1: Total number of pulmonary and extra-pulmonary cases.**

Total number of TB suspected cases	Total number of cases of pulmonary TB		Total number of extra-pulmonary cases diagnosed
	Number of sputum positive cases	Number of x-ray positive, smear negative cases	
2126	456 (62.2%)	53 (7.2%)	224 (30.5%)

Among 224 cases of extra-pulmonary TB studied, 136 (60.7%) were males and 88 (39.3%) were females and most of the patients were in the age group of 21-40 years (Table 2). In our study of 224 cases of extra-pulmonary tuberculosis, most common site of extra-pulmonary

tuberculosis was pleura (29.9%) followed by meninges (22.5%), abdomen (19.6%) and lymph node (10.7%) tuberculosis. The least common sites were hip joint, elbow joint, omental mass, skin TB and miliary TB (Table 3).

Among 224 cases of extra-pulmonary tuberculosis who are on DOTS treatment, 184 (82.2%) patients completed treatment, 17 (7.5%) patients defaulted, 22 (9.9%) patients died and there was 01 (0.4%) case of treatment failure (Table 4). Out of 17 defaulters the most common reason for defaulting treatment was irregular treatment (29.5%) and alcohol abuse (23.5%) (Table 5).

Out of 20 patients who died, 3 patients were co-infection with HIV among them 2 were of middle age group (21-40 years) and 1 was very young (<20 years). Among HIV negative patients most of the patients died were of middle age group (21- 40 years) and they all died due to complications of TB (Table 6).

**Table 2: Age and sex distribution of cases.**

Age	Sex		Total
	Male	Female	
< 20 years	23	31	54
21-40 years	79	39	118
41-60 years	26	14	40
>60 years	08	04	12
<b>Total</b>	<b>136 (60.7%)</b>	<b>88 (39.3%)</b>	<b>224</b>

**Table 3: Sites of extra-pulmonary tuberculosis.**

Sites of extra-pulmonary tuberculosis	Number of patients	Percentage
Pleura	67	(29.9%)
Meninges	51	(22.5%)
Abdomen	44	(19.6%)
Lymph node	24	(10.7%)
Spine	11	(4.9%)
Tuberculoma	11	(4.9%)
Eye	03	(1.3%)
Tb osteomyelitis	03	(1.3%)
Knee joint	03	(1.3%)
Ileocaecal	02	(0.8%)
Hip joint	01	(0.5%)
Elbow joint	01	(0.5%)
Omental mass	01	(0.5%)
Skin tb	01	(0.5%)
Miliary tb	01	(0.5%)
<b>Total</b>	<b>224</b>	<b>(100%)</b>

**Table 4: Treatment outcome of total subjects.**

Treatment outcome	Results (number of patients )	Percentage
Treatment completed	184	(82.2%)
Defaulted	17	(7.5%)
Died	22	(9.9%)
Failure	01	(0.4%)
<b>Total</b>	<b>224</b>	<b>(100%)</b>

In our study, 8 (3.6%) patients were found to be reactive for HIV antibodies and the remaining 116 patients were non-reactive (Table 7). In this study, among 8 HIV reactive patients, treatment was completed in 5 patients and the remaining 3 patients died during the course of treatment (Table 8).

**Table 5: Reasons for default.**

Reason for default	Number of patients (%)
Irregular treatment	05 (29.5%)
Alcohol	04 (23.5%)
Refused DOTS drugs	02 (11.7%)
Pulmonary embolism	01 (5.8%)
Not known	05 (29.5%)
<b>Total</b>	<b>17 (100%)</b>

**Table 6: Age of death of patients in HIV positive and negative patients.**

Age group	HIV positive	HIV negative
<20 years	01	01
21- 40 years	02	14
41-60 years	00	04
>61 years	00	00
<b>Total</b>	<b>03</b>	<b>19</b>

**Table 7: HIV status of patients with extra-pulmonary tuberculosis.**

Total number of patients	HIV status	
	Reactive	Nonreactive
224 (100%)	8 (3.6%)	216 (96.4%)

**Table 8: Treatment outcome in HIV positive patients.**

Treatment outcome	Results ( number of patients )
Treatment completed	05(62.5%)
Defaulted	00(0%)
Died	03(37.5%)
Failure	00(0%)
<b>Total</b>	<b>08(100%)</b>

## DISCUSSION

We studied 2126 suspected cases of tuberculosis at our site during the year 2015. Among 733 cases of TB diagnosed, 456 had sputum positive pulmonary TB, 53 had sputum negative pulmonary TB and 224 had extra-pulmonary TB. Sputum positive pulmonary TB accounted for 62.2%, sputum negative pulmonary TB 7.3% and extra-pulmonary cases accounted for 30.5% of total TB cases. Our study is in consistent with study done by Chandir S.<sup>4</sup> In present study tuberculosis was seen more in males compared to females. Similar results were seen in other studies.<sup>14,15</sup> However, Khan MA reported equal number of cases in both sex.<sup>16</sup> Tuberculosis mostly affects the lungs, but it may affect other organs of the

body. In our study the most common site of extra-pulmonary tuberculosis was pleura followed by meninges, abdomen and lymph node. The least common sites were hip joint, elbow joint, omental mass, skin TB and miliary TB. In a study conducted in south India, among extra pulmonary tuberculosis subjects, lymph node tuberculosis was most common followed by pleural tuberculosis, tuberculosis of abdomen, meninges, hip joint and skin.<sup>17</sup>

In the present study among 224 cases of extra-pulmonary tuberculosis that were put on DOTS treatment, 184 (82.2%) patients completed treatment, 17 (7.5%) patients were defaulters, 22 (9.9%) patients died and there was 01 (0.4%) case of treatment failure. Similar study conducted by Chandir S showed higher default rate (34.5%) and only 59.8% patients had completed treatment and more treatment failures (5.2%) compared to our study and finally 0.5% patients died during treatment in this study.<sup>4</sup>

The most common reason for default in our study was irregular treatment (29.5%) followed by alcohol abuse (23.5%). Chandrashekar reported illiteracy, alcohol intake and smoking as the causes for default.<sup>18</sup> The study by Tekle reported that default was 11.3%, the reason being lack of family support, inadequate knowledge of treatment duration and side effects of medication.<sup>19</sup> In our study, 8 (3.6%) patients were found to be reactive for HIV antibodies and the remaining 116 patients were nonreactive. In various other studies, seroprevalence varied from 0.4% - 10.9%.

In this study, 62.5% HIV reactive patients completed treatment which was low compared to the total number of patients who were treated under DOTS and who had completed treatment (82.2%). Only 9.9% of the total patients died during treatment, whereas a high number of patients who were HIV reactive died during treatment (37.5%) indicating that death rate was more in patients co infected with HIV limitation being very small population in this group.

## CONCLUSION

This study was conducted to study extra-pulmonary TB cases in our centre and to determine the treatment outcome of these patients treated under DOTS and also to look for any difference in outcome of treatment in HIV positive patients infected with extra-pulmonary TB. Extra-pulmonary tuberculosis accounts for 30.5% of the total cases studied.

Pleura is most common site of extra-pulmonary TB in our study. Treatment irregularities and alcohol abuse are the two most common reasons for default. There is a need to take measures to check the irregularity of treatment and alcohol abuse in patients who are on anti-tubercular treatment.

Co-infection with HIV seems to have a poor outcome on patients with extra-pulmonary TB and needs to be studied in large number of samples.

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