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Original Research Article

Study of the clinical profile and treatment outcome of pulmonary and extrapulmonary tuberculosis patients coming to respiratory medicine OPD

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ABSTRACT

Background: The major risk factors for development of tuberculosis are extremes of age, malnutrition, overcrowding and immune deficient states like AIDS, diabetes mellitus, measles, whooping cough and leukaemia. Chronic malaria and worm infestation are less important risk factors. Tobacco smoking, high alcohol consumption, corticosteroid therapy and immunosuppressive drug therapy reduce body defences there by increasing the susceptibility to tuberculous infection. This study was undertaken to analyse the various clinical presentations in patients with pulmonary tuberculosis and extra pulmonary tuberculosis.
Methods: This was a retrospective study of patients from October 2020 to September 2022 (2 years). Data collected from 300 patients who were diagnosed with pulmonary and extrapulmonary tuberculosis visited. The subjects were divided into subjects who had pulmonary TB (PTB), and who had extrapulmonary TB (EPTB).
Results: The most common systemic disorders accompanying EPTB were DM (n=11; 8.8%) and chronic renal failure (n=8; 6.4%); while DM (n=16; 9.1%) and chronic obstructive pulmonary disease (n=13; 7.4%) were those detected frequently in PTB group.
Conclusions: Present study showed higher percentage of males and greater predominance of pulmonary TB. It is also observed high percentage extrapulmonary TB. High percentage of positive treatment outcomes with fewer relapses and failures was observed in this study. A high positive treatment outcome noted may be attributed to the availability of specialist doctors and diagnostic facilities in the tertiary care centre.

Keywords: Clinical profile, Extrapulmonary TB, Outcome, Pulmonary TB, Treatment

INTRODUCTION

Tuberculosis is the most common infectious disease in the world. As per WHO estimates, one third of world's population is infected with tubercle bacilli and about 16-20 million cases of tuberculosis are prevalent world-wide.[1]

More than 3.8 million new cases of tuberculosis were reported to the WHO in 2001. 90% of these cases were from developing countries. WHO estimates that this figure is a gross underestimate, as the system of detection and reporting of cases in developing countries are incomplete. It has been estimated 8.5 million new of tuberculosis occurred in 2001. It has also been estimated that 1.8 million deaths occurred in 2000, and 98% of them in developing countries. In India 1.82 million new cases with 3.29 lakhs of death, were reported in 2004. One third of world's tuberculosis patients are in India. Currently India ranks first in incidence and prevalence of tuberculosis followed by China and Indonesia second and

third position respectively. In India, the incidence and prevalence rates reported are 168 and 312 per 1 lakh population respectively. A total of 8.14 lakhs of smear positive tuberculosis cases with a smear positivity rate of 75 per 1 lakh population were reported every year. 4.17 lakhs of death due to tuberculosis with a death rate of 30 per 1 lakh population were reported every year. Thus, tuberculosis remains the most common infectious disease in India causing significant morbidity and mortality. 50% of Indian population above the age 20 years is infected and will remain at risk of developing tuberculous disease.[2,3]

In males' prevalence of tuberculous infection increases up to 45-54 years and in females the peak of prevalence is noted below 35 years. Infants and young children have weak defences and are prone for miliary tuberculosis and tuberculous meningitis. Most of the cases are reported from rural and semi urban areas among low socio-economic population where malnutrition and overcrowding are rampant. In urban areas it is reported mainly in slum dwellers.[4]

The major risk factors for development of tuberculosis are extremes of age, malnutrition, overcrowding and immune deficient states like AIDS, diabetes mellitus, measles, whooping cough and leukaemia. Chronic malaria and worm infestation are less important risk factors. Tobacco smoking, high alcohol consumption, corticosteroid therapy and immunosuppressive drug therapy reduce body defences there by increasing the susceptibility to tuberculous infection.[5,6]

This study was undertaken to analyse the various clinical presentations in patients with pulmonary tuberculosis and extra pulmonary tuberculosis.

Aim

To study the clinical profile and treatment outcome of pulmonary and extrapulmonary tuberculosis patients coming to respiratory medicine OPD.

Objectives

To study the various clinical presentations in patients with pulmonary tuberculosis and extra pulmonary tuberculosis. To study the treatment outcome of the patients with pulmonary and extrapulmonary tuberculosis clinically, microbiologically and radiologically.

METHODS

Study area and population

The study took place at MGM Medical College, Aurangabad. Patients with pulmonary and extrapulmonary tuberculosis attending the respiratory medicine OPD formed the study population.

Study design

This was a retrospective study of patients from October 2020 to September 2022 (2 years).

Sample size

Data collected from 300 patients who were diagnosed with pulmonary and extrapulmonary tuberculosis visited.

Inclusion criteria

Patient diagnosed to have pulmonary and extrapulmonary tuberculosis clinically, radiologically and microbiologically were included.

Exclusion criteria

Patient diagnosed with drug resistant tuberculosis. Tuberculosis patients with HIV co-infections. Patients with other medical illnesses like diabetes mellitus, malignancy, chronic renal failure and renal transplant patients on immunosuppressive therapy.

Study tools

Study tools were sputum smear for AFB, CBNAAT, Chest x-ray PA view, specific investigations for various types of extrapulmonary tuberculosis.

RESULTS

In this retrospective study, socio-demographic and clinical and treatment profile of 400 patients with pulmonary and extrapulmonary tuberculosis attending the respiratory medicine OPD, MGM Medical College, Aurangabad, were recorded and analysed. The study revealed that 175 (43.7%) subjects had pulmonary TB (PTB), and 125 (31.25%) had extrapulmonary TB (EPTB).

Table 1: Demographic characteristics.

Characteristics		EPTB		PTB	
		N	%	N	%
Age	10-20	6	5	5	3
	21-30	18	14	28	16
	31-40	44	35	58	33
	41-50	28	22	37	21
	51-60	23	18	25	14
	61-70	5	4	16	9
	71-80	1	1	4	2
	81-90	1	1	4	2
Gender	Male	80	64	107	61
	Female	45	36	68	39
History of TB	Present	26	21	46	26
	Absent	99	79	130	74
Symptomatic	Yes	120	96	156	89
	No	5	4	19	11

Among the patients with EPTB, 45 (36%) were female and 80 (64%) males, and in the patients with PTB, 68 (39%) were female and 107 (61%) males. The difference between the groups was not statistically significant (p=0.721) (Table 1).

The mean age of the patients with PTB and EPTB were 43.7±7.3 and 46.2±8.4 years, respectively; however, the difference was not statistically significant (p=0.467).

Table 2: Sites of involvement in EPTB.

Site involved	EPTB	
	N	%
Lymph node	50	40
Pleura	35	28
Peritoneum	19	15
Bone	9	7
Meninges	6	4
Other sites	6	4

The most common sites were lymph nodes (40 %), pleura (28%), peritoneum (15%) and bone (7%) (Table 2).

Table 3: Systemic disorders.

Disorders	EPTB		PTB	
	N	%	N	%
Diabetes mellitus	11	8.8	16	9.1
Chronic renal failure	8	6.4	12	6.9
COPD	4	3.2	10	5.7
Hypertension	7	5.6	13	7.4
Congestive heart failure	3	2.4	9	5.1
Lymphoma	4	3.2	7	4.0
HIV positivity	2	1.6	4	2.3
None	86	68.8	104	59.4

The most common systemic disorders accompanying EPTB were DM (n=11; 8.8%) and chronic renal failure (n=8; 6.4%); while DM (n=16; 9.1%) and chronic obstructive pulmonary disease (n=13; 7.4%) were those detected frequently in PTB group. Systemic diseases detected in PTB and EPTB groups are shown in Table 3.

Table 4: Distribution of treatment and outcome.

Outcome	EPTB		PTB	
	N	%	N	%
Treatment completed	91	72.8	117	66.9
Defaulter	34	27.2	58	33.1
Recovered	86	68.8	93	53.1
Died	8	6.4	17	9.7

In the EPTB group, out of 125 subjects, 91 (72.8%) completed the treatment, 34 (27.2%) were defaulters, 86 (68.8%) recovered, and 8 (6.4%) died. In the PTB group, out of 175 subjects, 117 (66.9%) completed the treatment, 58 (33.1%) were defaulters, 93 (53.1%) recovered, and 17 (9.7%) died (Table 4).

DISCUSSION

In this study, we aimed to investigate and compare the demographic, clinical characteristics and treatment of EPTB and PTB. Our results indicated that EPTB is almost as common as PTB and it is more likely to affect women. Moreover, both PTB and EPTB appear as diseases affecting young adults in provincial tuberculosis control dispensary.

The incidence of EPTB was remarkably high (31.25%) in the present study. The most common sites of involvement were lymph nodes, pleura, peritoneum and bone. Interestingly, men were more likely be affected by PTB and women were more prone to EPTB. Biopsy was the most useful mode of diagnosis in EPTB, while sputum/smear analyses was the most commonly used diagnostic tool for PTB.

Earlier studies showed that the rates of EPTB cases among all TB cases ranged from 3.2% to 53.8%.[6-10] The predilection of EPTB for women may be linked with the limited facilities for access to healthcare and prevalence of other risk factors such as smoking habit.[11,12] Smoking is less common in women and this may be one of the factors responsible for the difference in distribution. Moreover, Lam et al have reported that the risk of mortality increased with smoking in men, but not in women.[13,14] These results imply that females may be relatively protected against the hazardous pulmonary effects of smoking. In contrary, PTB was encountered more frequently in men (59.6%) and the higher prevalence of smoking among men may be responsible for this finding. However, several studies investigated the impact of gender on the occurrence of EPTB and found that women were more likely to present their active TB as EPTB.[15-17]

We observed that young adult population was affected by PTB and EPTB. However, Musellim et al have reported that age was not associated with EPTB.[13] In the past decade, some cohort studies have reported an increased percentage of EPTB in patients with TB.[15,17] Even though TB is expected to arise more commonly in older population with deterioration of immune system, this finding reminds that control programs must be focused especially on young population. Campaigns and efforts must be directed to increase public awareness on this topic to combat with contagion of TB.

Similar to most of the other publications, lymph nodes were the most common sites involved in EPTB.[11,12,18] Controversially, Yang et al have reported that bone and joints were involved more commonly in EPTB, while another study suggested that genitourinary system and skin were affected more often than lymph nodes in EPTB.[19,20] These variations may be linked with social or

environmental factors. In our series, peritoneal involvement was the third most frequent site for EPTB group in our series.

Pulmonary tuberculosis may present as atypical pneumonia, pleuritis, or upper lobe involvement. It may present in an atypical fashion in case it is associated with HIV.[13]

Even though sputum/smear analysis and clinical/radiological clues are mostly beneficial in PTB; biopsy and histopathological diagnosis is usually required for ruling in EPTB.[11] Increased clinical awareness must be followed by choice of appropriate diagnostic method in order to make the diagnosis timely. It must be remembered that M. tuberculosis culture is the gold standard for establishing the definitive diagnosis.[12] However, rates of culture positivity are far less than expected not only in PTB cases but also in EPTB group.[12] This circumstance may insource from limitations of technical facilities. Therefore, other diagnostic modes such as biopsy, sputum/smear analysis and clinical-histopathological data may compensate for the aforementioned restrictions attributed to culture results.

In the literature, risk factors for EPTB were female gender in Asian and North African population, age for sub-Saharan African people and HIV infection in Europe.[21] These risk factors may show variability in different populations and the characteristics of EPTB need to be studied in multicentric studies on larger populations.

In the EPTB group, out of 125 subjects, 91 (72.8%) completed the treatment, 34 (27.2%) were defaulters, 86 (68.8%) recovered, and 8 (6.4%) died. In the PTB group, out of 175 subjects, 117 (66.9%) completed the treatment, 58 (33.1%) were defaulters, 93 (53.1%) recovered, and 17 (9.7%) died. A similar treatment effect was observed in a Goa study done by Motghare et al.[22]

Some restrictions of the current study must be mentioned. This study was performed on a small sample size with a retrospective design including only adult patients. In addition, impacts of social, ethnic, economic and environmental factors must be taken into account during extrapolation of our results to larger populations. Owing to the retrospective design, some critical data such as nutritional status, microbial factors and habits such as smoking and alcohol consumption may not be fully achieved from the medical files.

CONCLUSION

Present study showed higher percentage of males and greater predominance of pulmonary TB. It was also observed high percentage extrapulmonary TB. High percentage of positive treatment outcomes with fewer relapses and failures was observed in this study. A high positive treatment outcome noted may be attributed to the availability of specialist doctors and diagnostic facilities in the tertiary care centre. This might be attributed to properly supervised treatment provided at the tertiary care centre. In conclusion, EPTB is a frequent manifestation of TB which has substantial morbidity. Despite atypical features at presentation, diagnosis must be made without delay and appropriate treatment must be started as soon as possible for reduction of morbidity and mortality rates. Tuberculosis control programs must be targeted at specific populations under risk with special care on young and female populations.

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