

Original Article

Clinico-epidemiological Profile and Knowledge about Disease among Category I Tubercular Patients at a Tertiary Care Hospital of North India

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ABSTRACT

Introduction: WHO estimated tuberculosis (TB) burden to be 199/ lakh population in 2018 in India. The study was planned to collect and evaluate the clinico-epidemiological profile and knowledge about its perception as a disease in tubercular patients.

Methodology: A prospective, descriptive, observational study was conducted on 303 randomly selected category I tubercular patients attending DOTS center of a tertiary care hospital between January 2019 to December 2019 after institutional ethical approval. Detailed information about patients' sociodemography, presenting clinical symptoms, comorbidities, history of contact, and laboratory tests were collected using pre-validated proforma through personal/ telephonic interview and using electronic records. Questionnaire based 'Batalla test' was done to measure the patients' knowledge about TB.

Results: Maximum patients were between 20-40 years with male preponderance (61.7%). 85% belonged to lower-middle and upper lower socioeconomic class. Pulmonary cases were five times more than extra-pulmonary. Malnutrition, addiction, diabetes mellitus (DM), *human immuno deficiencies virus (HIV)* were associated morbidities in that order. Cough (40%), fever (21%), weight loss (9%) were main presenting symptoms. Chest X-ray (44.2%), Ziehl-Neelsen, fluorescent screening (34.6%), CBNAAT (20.5%), ESR (55.6%), and other (23.8%) lab tests were routinely used in diagnosing TB. 66% patients had satisfactory knowledge about disease as revealed by Batalla test.

Conclusion: TB primarily affected the reproductive and economically productive age group, male population, lower-middle, and upper lower socioeconomic class. Malnutrition, addiction, DM, *HIV* were commonly associated with TB, hence TB-Diabetes, TB-*HIV* collaborative activities and targeting malnutrition will help to identify and manage the disease. Moreover TB awareness programs are needed to further increase the understanding about TB among common public.

Key words: Batalla test, Clinico-epidemiological, DOTS, Tuberculosis.

INTRODUCTION

Tuberculosis is the ninth cause of global death, more than any other infectious disease. With 10.4 million infections in 2015 and 1.8 million people killed worldwide, it ranks even above *HIV/AIDS* as one of the major global health problems.¹ WHO has estimated its burden to be 199/ lakh population in 2018 in India.² TB has been declared a 100% notifiable disease in India and Government of India has taken measures like Nikshay portal to keep the record, Nikshay Poshan Yojna (NPY) to improve nutritional status, 99 DOTS to improve adherence etc. with the aim to eradicate it by 2030.^{3,4}

Old age, children, malnourished, and persons with exposure to smoking, alcohol are at increased risk of disease. Co-morbidities like diabetes mellitus, chronic renal failure, *HIV*, and drugs like steroids also adversely affect the predilection and outcome of disease.⁵ *HIV* are 15-22 times at higher risk of developing TB. TB-*HIV*

co-infection results in higher mortality rates and nearly 25% of all deaths among PLHIV are estimated to be due to TB.⁵ The *HIV* co-infection rate among incident TB patients is estimated to be 3.4%.⁶ 20% of all TB cases in India also suffer from diabetes mellitus. Diabetes triples the risk of TB, can worsen the clinical course of TB, and TB can worsen blood sugar control in people with diabetes. This is the reason to develop a 'National Framework for Joint TB-Diabetes Collaborative Activities' in 2017 in collaboration with National Program for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS). The framework aims to reduce morbidity and mortality due to TB and diabetes through prevention, bi-directional screening for early diagnosis and prompt management of TB and diabetes. Accordingly, all TB patients need to be screened for diabetes by testing for blood sugar, and diabetic patients attending diabetic clinics should be asked for symptoms of tuberculosis during each visit.⁷

Despite the herculean efforts, TB still continues to be a major problem with protean manifestations. The study was planned to collect and evaluate the clinico-epidemiological profile and knowledge about its perception as a disease in tubercular patients because it can help in providing relevant inputs for the better planning and developing management strategies.

METHODS

After obtaining the institutional ethical approval (via letter no. MC/EC/4123 dated 8/10/2018), a prospective, observational descriptive study was carried out in TB-DOTS centre of a tertiary care hospital attached to Government Medical College, Jaipur. Since TB is a notifiable disease, proper electronic records are maintained about patient related information and treatment regime according to recent guidelines. All category I TB patients visiting DOTS centre for treatment for the first time between January 2019 to December 2019 and willing to give consent were enrolled into the study. TB patients other than category I, MDR, those on concomitant immunosuppressant, pregnant, and lactating women were excluded. A prevalidated questionnaire was administered to every study participant. Part A of questionnaire had TB patients' identification information, socio-demographic, presenting clinical symptoms, comorbidities, history of

contact, and laboratory tests related data. Kuppuswami's socio-economic status scale used in study is based on education, employment, and income; all three taken together.⁸ The second part of questionnaire included the Batalla test to measure the patients' knowledge of tuberculosis. The Batalla test was originally developed to verify the knowledge of patients about blood pressure and later started to be used as a predictor of knowledge of individuals about other diseases.⁹ The test consists of three questions: Is tuberculosis a lifelong disease? Can tuberculosis be controlled through medication? Could you name one or more organs that may be damaged by tuberculosis? These three questions reflect a patient's knowledge on TB, and knowledge has been shown to be a predictor of adherence to TB treatment. If the patient correctly answers all questions, she/he was classified as having adequate TB knowledge. Excel sheet were prepared for data analysis and results were expressed in terms of frequency and percentage using Minitab 14 software (Pennsylvania, USA).

RESULTS

In the present study, maximum tubercular patients belonged to 21-30 years of age followed by 31-40 and 11-20 years of age. 11-40 years are the most active and productive years of one's life. Extremes of age i.e. less than 10 years and more than 70 years were least affected with category I TB (Figure 1). Male: female ratio was 1.6 (61.7% vs 38.3%). Pulmonary TB was found in 83.7% and extra-pulmonary in 16.3% of cases.

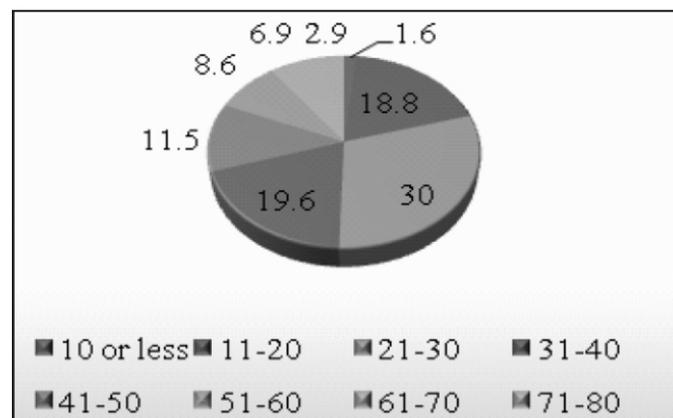


Figure 1: Age distribution of category I TB patients.

Amongst the total 49 extrapulmonary cases, lymph node involvement was the most common. Sometimes enlarged lymph nodes are the only presenting feature. Abdominal

and pleural involvements were also quite frequent. Site wise distribution of extrapulmonary TB is shown in figure 2. Surprisingly, most of the TB patients were literate in the present study. More than 70% were educated to high school and above (figure 3).

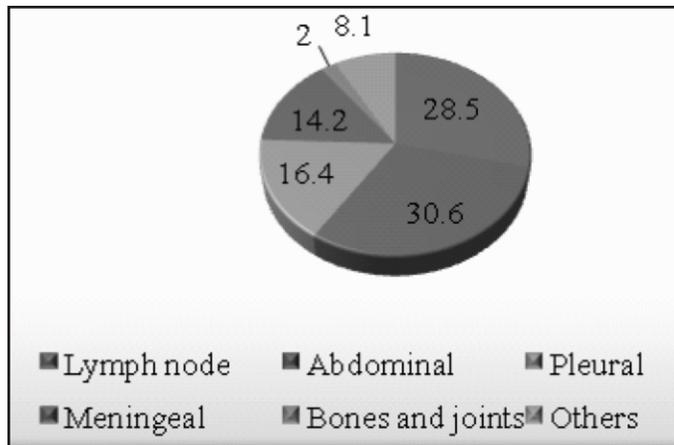


Figure 2: Site-wise distribution (%) of extrapulmonary category I TB patients.

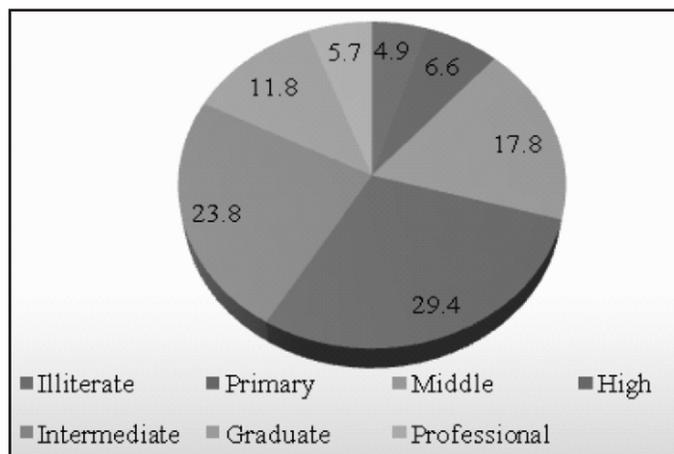


Figure 3: Education level (%) in category I TB patients.

According to Kuppaswamy socioeconomic status scale, our study reported that maximum 47.2% belonged to upper-lower socioeconomic class, and even upper class reported more cases than in lower most subclass (figure 4). Smoking and alcoholism were the most commonly noted comorbidity in TB. It is not clear whether they act by

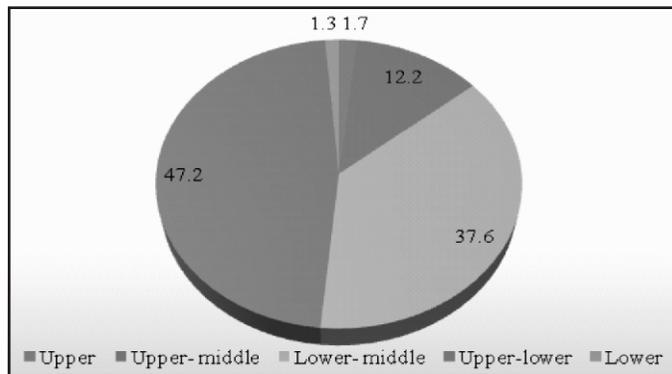


Figure 4: Socioeconomic status category (%) 1 TB patients.

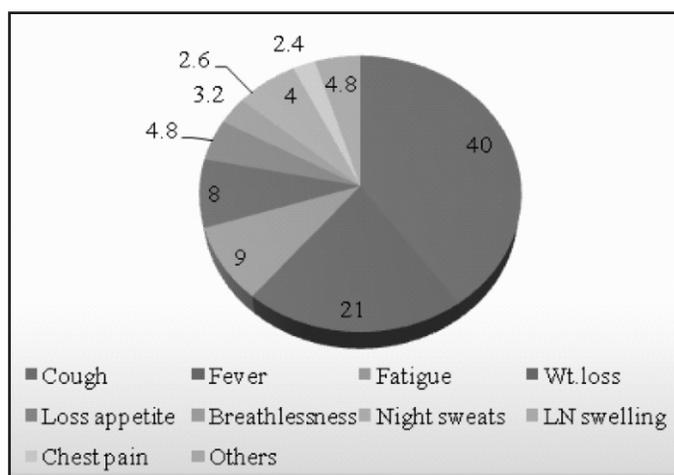


Figure 5: Presenting symptoms (%) in category I TB patients.

causing malnutrition or by decreasing the immunity as in diabetes mellitus and human immunodeficiency syndrome. Continuous cough for more than two weeks was the presentation in 40% of the patients (figure 5).

Core tests used in our study to diagnose were chest X ray, microscopy ZN and Fluorescent staining for acid fast bacilli (AFB) on various samples like sputum, pus, gastric lavage, pleural fluid, and CSF, CBNAAT, ESR and others (Figure 6). More than one test was used in many patients. 18% patients could give positive history of contact with active case of TB in the last two years.

Table 1: Comorbidities present with category I TB patients

Comorbidities	Active	Passive	Total	% of patients
<i>HIV</i>	3	3	6	1.98
Diabetes mellitus	10	12	22	7.26
Smoking/ alcohol	16	15	31	10.23

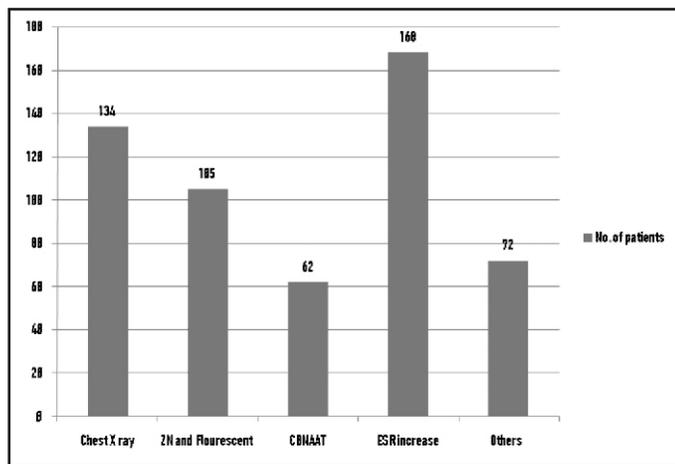


Figure 6: Laboratory tests used to diagnose/ confirm TB.

Batalla test revealed that 66% (200) patients had adequate knowledge about tuberculosis and they answered all the questions correctly. 84.5% (256) knew that TB can be controlled by medications. 77.9% (236) did not consider it a lifelong disease whereas 22.1% (67) perceived it as an off- on type of disease with relapses.

DISCUSSION

In the present study, total 303 category 1 TB patients were included. The mean age of patients was 36.7 years with maximum patients in the reproductive and economically productive age group of 21-30 years followed by 31-40 years and male preponderance (61.3% v/s 38.7%). These findings are similar to many studies which also found that maximum patients belong to 20-40 years of age and males outnumber females in tuberculosis in India.⁸⁻¹¹ Active social life and outdoor activity exposes the male sex and young and middle age group to TB. Socioeconomically, maximum (85%) patients belonged to lower-middle and upper-lower socioeconomic class in our study whereas, 66.83% of the individuals belonged to lower class and 27.39% belonged to upper lower class as per Kuppaswamy rating system applicable to Indian families in similar study by RS Kashyap et al.⁸ This study found that 83.7% of patients had pulmonary presentation and 16.3% were suffering from extrapulmonary tuberculosis. However, lot of variation has been reported in the percentage of EPTB cases (between 17.4% to 41.4%) nationally and internationally which could be due to many demographic variables. Indian national average of EPTB is 17-18%.¹² Study by Reddy et al¹³ reported extra pulmonary TB was

common in younger age <25 years than PTB and in females as found in our study. However Pang Y et al¹⁴ mentioned a study with two peaks; in less than 15 years and more than 65 years of age in case of extrapulmonary TB. This could be because of malnutrition in both and various comorbidities in elderly which are an additional risk factors for tuberculosis.^{15,16} Lymph node, abdomen, skin, pleural membrane involvement are the most common form of EPTB in ours as well as other studies.^{17,18} As expected, cough, fever, fatigue, and weight loss were the commonest presentations as in many other reported studies.^{17,22,23}

In the present study, 2% TB patients were co-infected with *HIV* as shown in table 1. When compared with other studies, this proportion varied from 0% in Bosnia Herzegovina, Iceland to 22.3% in Ukraine.¹⁹ In India, though *HIV*-TB co-infection rate varied from 1.5-10%, the average TB-*HIV* co-infection rate is 3.4% (report 2020). *HIV* infection status is an integral component of TB surveillance systems in only a few countries including India given the inextricable link between the two infections.²⁰

Similarly, 7.26% had concomitant diabetes mellitus in our study whereas it ranged between 1.18% to 19.15 in various other studies.^{21,22} The percentage of patients consuming alcohol and tobacco was 10.23% in our study against 16% (alcoholics) and 38.2% (smokers) in another study by Malhotra et al.²² Similarly 36% were smokers in study by Koul et al¹¹ and in a study by Baig et al²³, 18.5% were alcohol users and 25.9% used tobacco. Chest X Ray, ZN and fluorescent staining microscopy tests, CBNAAT were amongst the important diagnostic tests in our study. Besides these ESR and others depending on site of infection and sputum positivity or negativity, CT chest, abdomen, bones, FNAC were also done in 23% patients. Same tests were used in another study except Mantoux test which was not used in our study for diagnosis.¹⁷ We found 18% had history of contact with patients which is almost half reported in the study by Fagundez et al.⁹

66% of our patients had remarkably good knowledge about disease according to Batalla test. This could be because majority of them were literate with an access to information through media also. This is in concordance with another study which reported 63.27% of interviewees having good knowledge about TB (Batalla test) and

patients that could not read or write were significantly more likely to have worst knowledge about TB than patients who were literate. The identification of the affected organs was the worst scored one according to the Batalla test in ours as well as previous study.⁹

CONCLUSION

TB primarily affected the most productive and reproductive age group. Male population, lower-middle and upper lower socioeconomic class, malnutrition, addiction, DM, *HIV* were found to increase risk of TB. Hence TB-Diabetes, TB-*HIV* collaborative activities and targeting malnutrition will help in dealing the disease and 'parichay' like TB awareness program will further increase the understanding about TB.

LIMITATION

The limitation of this study is that this was done in a small region from India and with small sample size. We strongly suggest that efforts should be made at a national level, as the results obtained from a large study including various states and different socioeconomic areas will be of immense use to medical fraternity, policy-makers and the nation at large. Although preliminary, our results provide an important direction for future studies to be undertaken for larger studies to be undertaken in the near future.

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