Research Article

Health profile of DOTS-registered tuberculosis cases in a tertiary care hospital

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Abstract

Background: Every year, more than 9 million new cases of tuberculosis (TB) occur worldwide and nearly 2 million people die of the disease. Problem of TB is enormous, and makes it a major public health problem in India. There is a need to study various sociodemographic factors associated with Directly Observed Treatment Short course (DOTS)-registered patients and health components affected by TB.

Objective: To study health profile, sociodemographic profile of these patients, and to give recommendation based on study findings.

Materials and Methods: It was a hospital-based cross sectional study conducted in DOTS OPD of our tertiary care hospital. All patients registered and taking treatment during January–June 2014 were included in study. Data were collected by a pre-structured questionnaire and were entered in a Microsoft Office Excel 2007 sheet and analyzed by Epi Info 7.

Results: Of total 64 patients, 38 (60%) were male and 26 (40%) were females. Pulmonary TB was present in 43 (67%) and extrapulmonary TB was present in 21 (33%) DOTS-registered patients. Of 64 patients, 12 (19%) had a history of repeated admissions to the hospital for treatment of TB. HIV testing by an Integrated Counseling and Testing Centre (ICTC) were conducted in 63 (98%) patients and 7 (11%) were found to be reactive. All of them were on antiretroviral therapy (ART), and 51% of the patients had body mass index less than 18.5 kg/m^2. Multidrug-resistant TB was 5% among total DOTS-registered patients in the present study. Irregular treatment was found in 17% patients.

Conclusion: The study found that more than half of the patients were undernourished, and TB patients had low education and lower socioeconomic status along with problems of addictions, HIV co-infection, and irregular treatment. Adequate counseling and education of patients and their close relatives might help to improve treatment compliance and nutritional status of the TB patients.

KEY WORDS: Tuberculosis, DOTS, registered patients, health and sociodemographic profile

Introduction

Tuberculosis (TB) is an infectious disease caused by *Mycobacterium tuberculosis*. Every year, more than 9 million new cases of TB occur worldwide and nearly 2 million people die of the disease. Problem of TB is enormous and makes it a major public health problem in India. Nearly half a million cases have the multidrug-resistant (MDR) form of the disease. While Asia bears the largest burden of the disease, sub-Saharan Africa has the highest incidence of drug-susceptible TB and Eastern Europe has the highest incidence of MDR-TB.[1] Under the Revised National Tuberculosis Control Program (RNTCP), priority is given to the smear-positive cases. Every smear-positive person, if left untreated, has potential to infect 10–15 persons per year, thereby increasing the pool of infected persons.

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Extent of TB Problem in India

India accounts for 26% of the total global TB burden, that is, 2.0–2.5 million new cases annually. Of all TB-notified cases in India, 53% are smear-positive cases, 28% are smear-negative cases, and 19% are extrapulmonary cases. Only 2.1% of TB cases are MDR-TB cases, and there are only 6% of HIV-positive TB patients in India.[2]

TB accounts for 17.6% of all deaths from communicable diseases and for 3.5% of all causes of deaths. More than 80% of burden of TB is due to premature deaths as measured in terms of disability-adjusted life years lost.[3]

Since its inception in 1997, RNTCP has initiated about 15 million patients on treatment and 2.5 million lives have been saved. The success rate since 2005 has been 85% among new smear-positive cases.[3]

TB affects adults in the most productive age group (15–54 years); more than 80% of cases are in this age group. It kills more women in reproductive age group than all causes of maternal mortality combined and creates more orphan than any other infectious disease.[3]

There is need to study various sociodemographic factors associated with Directly Observed Treatment Short course (DOTS)-registered patients and health components affected by TB.

Objectives

- To study the health profile of DOTS-registered TB patients in tertiary care hospitals
- To study sociodemographic profile of DOTS-registered TB patients
- To study morbidity profile of these patients
- To give recommendation based on study findings.

Materials and Methods

It was a hospital-based cross-sectional study conducted in a DOTS OPD of our tertiary care hospital of SRTR Medical College, Ambajogai. All DOTS-registered patients attending DOTS OPD over 6 months (January 2014 to June 2014) were included in study except patients not giving consent for participation in study. Data were collected by using a pre-structured questionnaire. They were entered in a Microsoft Office Excel 2007 and analyzed by Epi Info 7.

Ethical Considerations

Ethical clearance for the study was obtained from the institutional ethics committee of SRTR Medical College, Ambajogai. Informed consent was sought from the patients. The patients were informed about the nature and the purpose of the study. It was explained to the subjects that the information provided will be kept confidential.

Results

Out of total 64 patients, 38 (60%) were male and 26 (40%) were females. Pulmonary TB (PTB) was present in 43 (67%) and extrapulmonary TB was in 21 (33%) DOTS-registered patients.

Table 1: Distribution of DOTS-registered patients according to age and sex

Age group	Male (%)	Female (%)	Total (%)
<15	0	7	7 (11)
15–25	5	5	10 (16)
25–35	4	4	8 (12)
35–45	11	5	16 (25)
45–55	5	1	6 (9)
55–65	3	2	5 (8)
>65	10	2	12 (19)
Total	38	26	64 (100)

Table 2: Socioeconomic class of DOTS-registered patients (BG Prasad classification)

Socioeconomic class	Frequency	Percentage
Class 1	4	6
Class 2	13	20
Class 3	18	28
Class 4	28	44
Class 5	1	2
Total	64	100

Table 3: Sociodemographic profile of DOTS-registered patients

	Frequency	%
Urban	61	95
Rural	3	5
Overcrowding	36	56
Kaccha house	44	69
Ill ventilation	38	59
Joint family	36	56
Nuclear family	28	44
Open air defecation	34	53
Hand-washing practices	21	33
Covering mouth at coughing	50	78
Alcohol addiction	22	34
Tobacco consumption	32	50
Paan and gutkha	23	36

Religion-wise distribution of DOTS-registered patients shows 70% were Hindu, 27% Muslim, and 3% were of Buddhist. Category-wise distribution shows that 47 (73%) patients were on cat 1, 14 (22%) on cat 2, and 3 (5%) were on cat 4, that is, the prevalence of MDR-TB was 5% among total DOTS-registered patients in the present study.

Phase of Treatment of DOTS Patients

At the time of study, 26 (41%) patients were in the intensive phase and 38 (59%) were in continuation phase of DOTS therapy. Majority (70%) of the patients were in 15–65 years age group, an economically productive age group and 19% of the patients were aged above 65 years [Table 1]. Most of the

Table 4: Education status of DOTS-registered patients

	Frequency	%
Illiterate	13	20
Primary school	11	17
Secondary school	33	52
Graduation and above	7	11
Total	64	100

Table 5: Occupation of DOTS-registered patients

	Frequency	%
Driver	3	5
Farmer	3	5
Government servant	4	6
Housewife	13	20
Laborers	22	34
Self-employed	4	6
Students	8	13
Unemployed	7	11
	64	100

Table 6: Distribution of DOTS-registered patients according to body mass index

BMI	Cat 1	Cat 2	Total
<18.5	23 (49%)	10 (59%)	33 (51%)
18.5–24.99	24 (51%)	6 (35%)	30 (47%)
>25	0 (0%)	1 (6%)	1 (2%)
	47 (100%)	17 (100%)	64 (100%)

Table 7: Patients taking irregular treatment according to phase of treatment

Phase	Male	Female	Total
Intensive phase	1	0	1
Continuation phase	9	1	10
Total	10	1	11

patients were from lower socioeconomic class; 44% patients belonged to social class 4 [Table 2]. It was found that 69% patients lived in kaccha house; overcrowding was present in 56% of houses; ventilation was inadequate in 59% of houses; and 56% patients lived in a joint family [Table 3].

Covering mouth while coughing was practiced by 78% of the patients, open air defecation was practiced by 53% of the patients, whereas hand-washing was practiced by only 33% of the patients [Table 3]. Alcohol addiction was present in 34% patients, 50% had a habit of tobacco consumption, whereas 36% patients were consuming paan and gutkha.

It was found that 20% of patients were illiterate, 17% had education up to primary level, and 52% up to secondary school. Only 11% of patients were graduates [Table 4]. Further, 34% patients were laborers and 20% were housewife by occupation while 13% were students and 11% were unemployed [Table 5]. Table 6 shows that 51% of the patients had

Table 8: Symptoms complained by DOTS-registered patients

Symptom	Frequency	Percentage
Cough	40	63
Fever	52	81
Decreased appetite	50	78
Loss of weight	30	47
Breathlessness	9	14

Table 9: Health complaints experienced by DOTS-registered patients

Complaint	Cat 1 (47)	Cat 2 (17)	Total (64)
Gastritis	35	13	48 (75%)
Jaundice	4	8	12 (19%)
Weakness	23	11	34 (53%)
Red urine	22	8	30 (47%)
Vision problem	5	5	10 (16%)
Skin rashes	4	2	6 (9%)
Abdominal pain	22	3	25 (39%)
Joint pain	13	2	15 (23%)

body mass index (BMI) less than 18.5 kg/m^2 and only 1 (2%) patient was obese.

Irregular treatment was present in 17% of the patients [Table 7]. Fever (81%), decreased appetite (78%), cough (63%) followed by weight loss (47%) and breathlessness (14%) were the presenting symptoms in DOTS-registered patients [Table 8]. It can be seen from Table 9 that 75% patients complained of gastritis, 53% weakness, and 47% red urine as adverse effect of DOTS therapy.

Of 64 patients, 12 (19%) had history of repeated admissions to the hospital for treatment of TB. HIV testing through Integrated Counseling and Testing Centre (ICTC) was done in 63 (98%) patients and 7 (11%) were found to be reactive; all of them were on antiretroviral therapy (ART).

Discussion

The study shows that 37% of the patients enrolled in the study had education up to fourth standard (including 20% of illiterate subjects). It can be assumed that treatment-seeking for such may not be up to the mark, especially considering long-term nature of DOTS. A good proportion (34%) of subjects was laborers by occupation, whereas 11% were unemployed. Regular income has been associated with high treatment success rates, as revealed by a study conducted in Bangkok by Okanurak and co-workers.[4] Their study also show that the level of education and knowledge was also significantly associated to treatment success**.**

Majority of the TB patients (46%) belonged to low socioeconomic status, which is in accordance to a study done in South India on risk factors for TB by Shetty et al.,[5] showing that TB most commonly affects lower socioeconomic class population (low income and low education). There is a

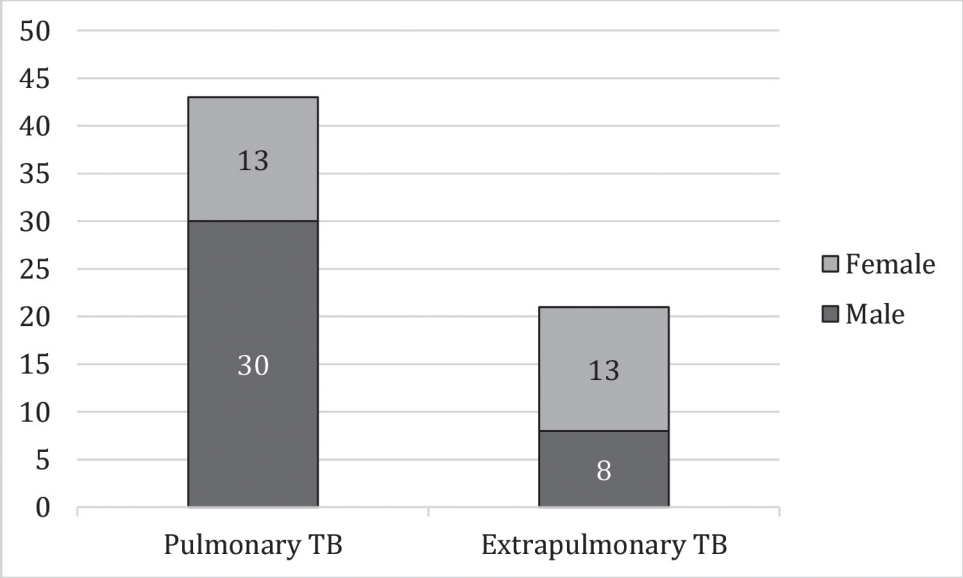

Figure 1: Distribution of patients according to gender and site of involvement.

significant degree of nutritional depletion and weight loss in PTB patients than in general population. BMI is considered to be a useful technique for assessment of nutritional state of PTB. The nutritional derangement could call for prompt nutritional intervention in the management of PTB patients.[6]

It was found that 51% of the patients had BMI less than 18.5 kg/m^2. The association between TB and undernutrition has long been known. TB makes undernutrition worse and undernutrition weakens immunity, thereby increasing the likelihood that latent TB will develop into active disease. Most individuals with active TB are in a catabolic state and experience weight loss and some show signs of vitamin and mineral deficiencies at diagnosis. Weight loss among those with TB can be caused by several factors, including reduced food intake due to loss of appetite, nausea and abdominal pain; nutrient losses from vomiting and diarrhea, and metabolic alterations caused by the disease. Low BMI (lower than 18.5 kg/m^2) and lack of adequate weight gain with TB treatment are associated with an increased risk of death and TB relapse and can be an indication of severity of TB, poor

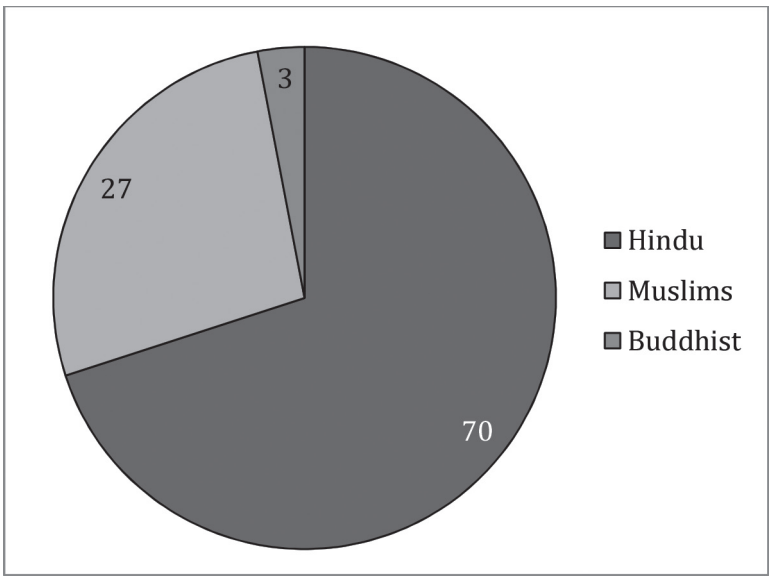

Figure 2: Religion-wise distribution of DOTS-registered patients.

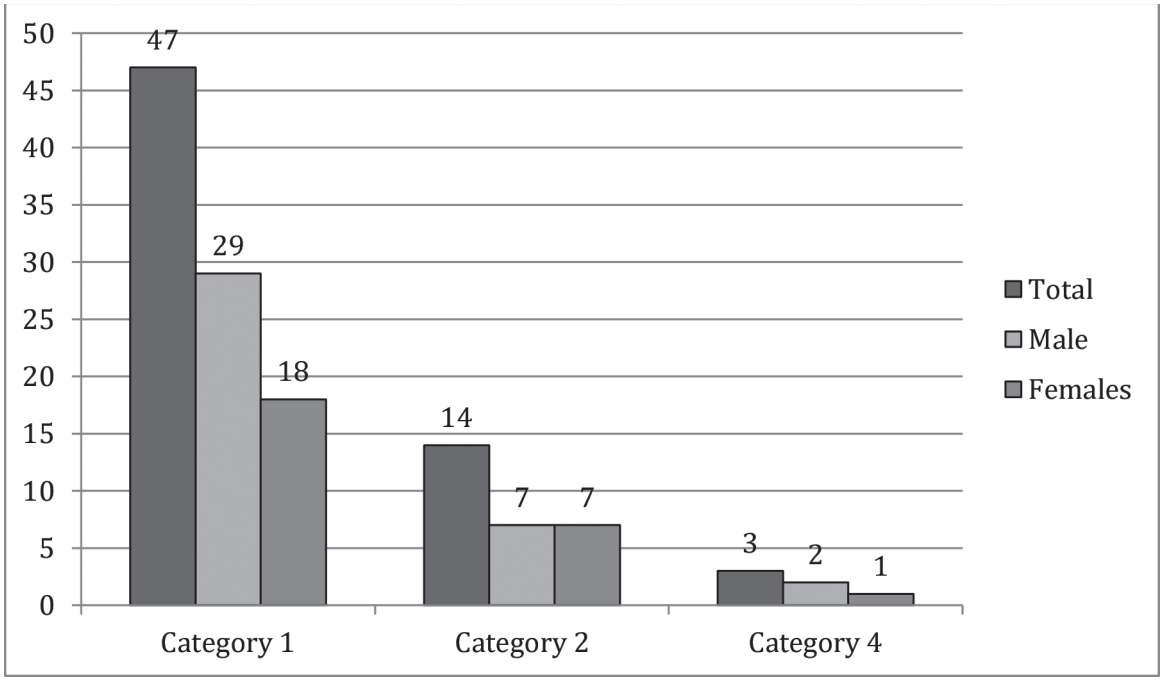

Figure 3: Category and sex-wise distribution.

treatment response, and/or the presence of other comorbid conditions.[7]

The prevalence of MDR-TB was 5% among total DOTS-registered patients in the present study. The prevalence of MDR-TB among PTB patients was 5.3% (3.6%–6.2%) in WHO-estimated burden of MDR-TB.[8] MDR-TB is defined as TB disease where the bacilli is resistant to isoniazid (H) and rifampicin (R), with or without resistance to other drugs.

Irregular treatment was present in 17% of the patients. Irregular consumption and frequent interruption in taking treatment for TB are the most common causes of acquiring multidrug resistance. In India, MDR-TB among new cases is estimated to be 2%–3% and amongst re-treatment cases to be 14%–17%.[9] In India, a great concern is the potential threat of drug-resistant TB and extensively drug-resistant TB with the existing unregulated availability and

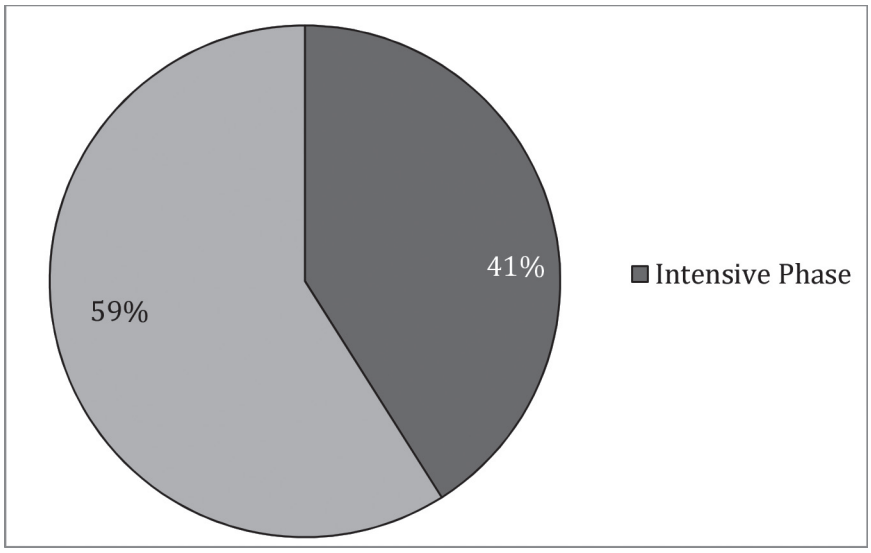

Figure 4: Phase of treatment of DOTS patients.

injudicious use of first- and second-line anti-TB drugs in the country.

We found that 7 (11%) patients were reactive and all of them were on ART. Concomitant TB and HIV infection are a lamentable medical phenomenon with dreadful social and economic impacts across the globe, aptly described as the "accursed duet." The HIV epidemic has posed major and almost insurmountable challenges to TB control efforts across the world. Out of 574 TB study subjects, 28 (4.87%) were found to be HIV positive in study by Rishi et al.[10] The prevalence of HIV among estimated incident TB patients is 5% (3.3%–7.1%) in WHO estimates.[8]

It was found that 34% patients were alcoholic. Alcoholism has been identified as an important predictor of noncompliance in several studies in different parts of the world. Elicitation of history of alcoholism before treatment initiation will help in identifying potential defaulters needing special attention during treatment. Improving compliance among alcoholic patients through support from family, health staff, and social organizations is a challenge to be addressed. Side effects to anti-TB drugs, as reported in other studies,[11] were also strongly associated with default.

Of the patients, 75% complained of gastritis, 53% weakness, and 47% red urine as adverse effects of DOTS therapy. DOT providers need adequate orientation regarding possible side effects and prompt referral of patients to the medical officer for remedial measures. Frequently reported minor side effects could be successfully dealt with proper instructions on drug consumption, reassurance to patients, and prompt symptomatic treatment before it leads to default.

Limitations

This study has got certain limitations, like inclusion of patients seeking only government facilities for DOTS. Although the impact of the above sociodemographic characteristics on the treatment success of this study subjects is not evaluated in this study, it could have been achieved by future large-scale studies.

Recommendations

All individuals with active TB should receive (i) an assessment of their nutritional status; (ii) appropriate counseling based on their nutritional status at diagnosis and throughout treatment; (iii) motivation for compliance to regular and complete treatment; (iv) regular follow-up during treatment, including weight monitoring and counseling to quit alcohol and tobacco consumption; and (v) improvement in living conditions, education, socioeconomic status, and sanitation to curtail the prevalence of TB.

Conclusions

The study found that more than half of patients were undernourished and that TB patients have low education and lower socioeconomic status along with problems of addictions and HIV co-infection and irregular treatment. Adequate counseling and education of patients and their close relatives might help to improve treatment compliance and nutritional status of TB patients. The occurrence of TB was high among productive age group, especially in males. An improvement in living conditions, education, socioeconomic status, and sanitary practices is desirable to curtail the prevalence of TB.

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