

Socio demographic profile of patients on Directly Observed Treatment Short Course Chemotherapy in Mandya Tuberculosis Unit, Karnataka

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Date of Submission : 09-01-2018

Date of online Publication : 07-02-2018

Date of Acceptance : 30-01-2018

Date of Print Publication : 31-03-2018

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Abstract

Background: The World Health Organization (WHO) declared Tuberculosis (TB) a global public health emergency in 1990. Tuberculosis remains a worldwide public health problem despite highly effective drugs and vaccine being available. An estimated 9.0 million people developed TB in 2013 and caused 1.5 million deaths. India has the highest burden of TB cases in the world. Emergence of MDR-TB is a threat looming large over the world. TB is a social disease with medical factors. Identifying and understanding these factors would help in achieving better outcomes among the patients and controlling the spread of TB. **Objectives:** To describe the socio-demographic profile of patients registered for DOTS at Mandya Tuberculosis Unit (TU)& To determine their HIV status. **Methodology :** This descriptive cross sectional study was conducted from 1st July 2014 – 31st December 2014. The subjects were recruited from the patients registered for DOTS in Mandya Tuberculosis Unit, Mandya. The data regarding socio-demographic details, medical history and personal history was collected from the study subjects using pretested semi-structured questionnaire and treatment cards from DOTS centres. **Results:** Among the 206 study subjects, 68% were males, 29.1% in the age group of 30-44 years, 61.7% married, 58.7% were from joint family & were illiterates and 56.3% of them belonged to low socio economic status. 55.3% were from rural area and 77.2% were living in pucca house. 53.1% were sputum positive pulmonary, 21.9% were sputum negative pulmonary and 25% were extra pulmonary cases. 20.9% of the subjects were HIV reactive. **Conclusion:** Majority of the study subjects were in the economically productive age group and were males. More than half of them were illiterates and from low socio economic status. Hence there is need to improve the socioeconomic status, educational status and living conditions to bring down the prevalence of tuberculosis.

Key-words: Tuberculosis, Socio demographic profile, DOTS.

INTRODUCTION

Tuberculosis (TB) is one of the world's deadliest communicable disease. An estimated 9.0 million people developed TB in 2013 causing 1.5 million deaths and 3,60,000 among them were HIV-positive. Although TB is slowly declining each year and an estimated 37 million lives were saved between 2000 and 2013 through effective diagnosis and treatment, the death toll from the disease is still unacceptably high and efforts to combat it must be accelerated if 2030 global targets, set within the context of the Sustainable Development Goals (SDGs), are to be met.¹

Of the estimated 9 million people who developed TB in 2013, more than half (56%) were in the South-East Asia and Western Pacific Regions. Further one quarter were in the African Region, which also had the highest

rates of cases and deaths relative to population. India and China alone accounted for 24% and 11% of total cases, respectively. About 60% of TB cases and deaths occur among men, but the burden of disease among women is also high. Globally, 3.5% of new and 20.5% of previously treated TB cases were estimated to have had MDR-TB in 2013.¹

India is the second-most populous country in the world and one fourth of the global incident TB cases occur in India annually.² On a national scale the high burden of TB in India is illustrated by the estimate that TB accounts for 17.6% of deaths from communicable disease and for 3.5% of all causes of mortality. More than 80% of the burden of tuberculosis is due to premature death, as measured in terms of disability-adjusted life years (DALYs) lost.³

The World Health Organization (WHO) has suggested that the expected effect of improved diagnostic

and treatment services may be negated by an increase in the prevalence of risk factors for the progression of latent TB to active disease in segments of the population which may tend to increase incidence despite reductions in transmission achieved under the Stop TB strategy. Broadly described, these risk factors may be biomedical (such as HIV infection, diabetes, tobacco, malnutrition, silicosis, malignancy), environmental (indoor air pollution, ventilation) or socioeconomic (overcrowding, urbanization, migration, poverty).³

The Government of India launched the Revised National TB Control Programme (RNTCP) in 1993 and adopted the internationally recommended Directly Observed Treatment Short-course (DOTS) strategy, as the most systematic and cost-effective approach to revitalize the TB control programme in India and achieved country wide coverage under RNTCP in March 2006.⁴ In 2006, STOP TB strategy was announced by WHO and adopted by RNTCP. Decentralized treatment is provided through a network of more than 600,000 DOTS providers, to provide treatment to the patients as near to their home as possible.

The vision of the Government of India is for a "TB-free India" with reduction of the burden of the disease until it is no longer a major public health problem. To achieve this vision, the programme has now adopted the new objective of Universal access for quality diagnosis and treatment for all TB patients in the community through the National Strategic Plan (2012-2017) under the 12th Five Year Plan of Government of India.

TB is a social disease with medical factors. Many social factors like poverty, under nutrition, poor housing, lack of education, alcohol, smoking which are interrelated contribute to the occurrence and spread of TB.⁴ Identifying and understanding these factors would help in achieving better outcomes among the patients and controlling the spread of TB. Hence this study was undertaken to describe the socio-demographic profile of patients registered for DOTS at Mandya Tuberculosis Unit (TU) and to determine their HIV status.

MATERIAL AND METHODS

Study setting: The present study was conducted in Mandya Tuberculosis Unit, Mandya district, which covers 5 Designated Microscopy Centers (DMCs).

Study design : Descriptive cross sectional study

Period of Study: (6 months)1st July 2014 – 31st December 2014

Study Population : Patients registered for DOTS in Mandya Tuberculosis Unit, Mandya during 3rd and 4th quarters of 2014, starting from 1st July 2014 to 31st December 2014.

Ethical Considerations: Study was initiated after obtaining approval from the Institutional Ethics Committee of Mandya Institute of Medical Sciences, Mandya.

Inclusion Criteria: All patients registered for treatment under DOTS from 1st July 2014 to 31st December 2014 at Mandya Tuberculosis Unit, Mandya and who gave consent for the study.

Exclusion Criteria: Those patients who were transferred out from Mandya Tuberculosis Unit, Mandya district during any stage of the treatment were excluded from the study.

Description of the Study Setting

Mandya District is located in the south interior part of Karnataka. Total area is 4,98,244 hectares, more than half of which is put into agricultural use. The District comprises of 7 taluks namely Mandya, Maddur, Malavalli, Srirangapattana, K R Pete, Nagamangala and Pandavapura. Total Population of district is 17,61,718 with population density of 364 persons/sq km and sex ratio of 995 females/1000 males. The literacy rate is 61.21% with male literacy rate at 70.71% and female literacy rate at 51.62%.⁵

The organisational structure of RNTCP at Mandya functions under the District Tuberculosis Office headed by District TB Officer (DTO). The administrative control of the District TB Office is by District Health Office under the State Health and Family Welfare Department. There are 5 Tuberculosis Units (TU) and 25 DMCs in the District. Mandya TU covers a population of 4,38,520 and includes the 5 DMCs located at MIMS Hospital, District TB Center (DTC), Maddur General Hospital, Shivally PHC and Sanjo Hospital which is a private hospital. The DMC in MIMS gets the subjects referred for sputum AFB examination mainly from the hospital outpatients & inpatients. The DMC at DTC gets referrals from 15 PHCs out of which 2 are Urban Health Centers and rest are rural. The patients suspected to have TB are referred for sputum examination to these DMCs and the microscopic examination is done as per the RNTCP guidelines. Patients found positive are categorised and either started on treatment or referred out depending on their convenience. Sputum negative cases and extrapulmonary cases are started on treatment after confirming the diagnosis as per the protocols.

Collection of Data

After obtaining the approval from the Institutional Ethics Committee, the study proposal was submitted to the District TB Officer to obtain clearance from the District Health Society. The permission to conduct the study was given by the Society chaired by the Chief Executive Officer (CEO) of the Zillah Panchayat of Mandya District.

The patients who got registered and initiated on treatment of DOTS with in Mandya TU from 1st of July 2014 up to 31st December 2014 were taken into the study as follows. The information regarding newly registered patients were obtained from the Senior Treatment Supervisor (STS) and Senior Tuberculosis Laboratory Supervisor (STLS), Laboratory Technicians of DMCs. The patients were contacted at either the DOTS center or at their house by the investigator and explained about the study and informed consent was taken from the patient to participate in the study. Those who gave consent for the study were included in the study. Information regarding socio-demographic details, medical history and personal history of the patients were taken using a pretested semi-structured questionnaire. In case of children, the information was obtained from the parent/guardian. Information regarding

the patient's treatment which included categorisation, investigation details, DOTS provider was collected from the RNTCP treatment cards of each patient available at the DOTS centre.

Operational Definitions

Socio-demographic variables

- Age: A completed year of a person on the date of registration for treatment.
- Illiterate: A person aged more than 7 years who cannot read and write with understanding in any language.
- Primary education: Education up to 7th standard level.
- High school: Education up to 10th standard.
- Degree: One who has obtained an undergraduate or post graduate degree and above.
- Pre-school: All children up to 7 years of age.
- Socio- economic status: All individuals were classified into various socio-economic class according to Modified B. G. Prasad's classification June 2014 (All India consumer price index for the June 2014 was 255)⁶ (Class I= ≥ 5821, class II = 2910-5820, class III = 1746-2909, class IV=873-1745 and Class V= ≤ 873)
- Nuclear family: A family of one or less than one couple along with or without their children.
- Joint family: Anything other than the nuclear family
- Unmarried: Includes all persons who have never been married
- Married: Includes persons whose current marriage has not ended through widowhood, divorce or separation (Regardless of previous marital history)
- Separated: Includes persons not legally separated or otherwise absent from their spouse because of marital discord
- Divorced: Includes persons who are legally divorced and who have not remarried
- Widowed: Includes widows and widowers who have not remarried
- Occupation: occupational groups were classified according to National Occupational Classification 2004⁷

Disease Classification as per RNTCP

- Smear-positive pulmonary TB: A patient with one or two smears being positive for AFB out of the two sputum specimens subjected for smear examination by direct microscopy is diagnosed as having smear positive pulmonary TB.
- Smear-negative pulmonary TB: A patient with symptoms suggestive of TB with two smear examinations negative for AFB, with evidence of pulmonary TB by microbiological methods (culture positive or by other approved molecular methods) or Chest X-ray is classified as having smear negative pulmonary tuberculosis.
- Extrapulmonary TB: Tuberculosis of organs other than the lungs such as pleura, lymph nodes, intestine, genitourinary tract, joint and bones, meninges of the brain etc., is called as extra-pulmonary TB. Pleural tuberculosis is classified as extra pulmonary.

Statistical Analysis

Data was entered into Microsoft excel sheet and analysed using SPSS (Statistical Package for Social Sciences) version 15. Descriptive statistics like percentages, mean, standard deviation and frequencies and proportions were used to describe the data.

RESULTS

During the 3rd and 4th quarters of 2014 in five DMCs coming under Mandya TU, 2,874 TB suspects were subjected to sputum examination for AFB. Of these, 239 were positive. Out of the diagnosed, 104 were started on

treatment within the TU and the rest were referred out to their convenient TUs for treatment. Including 34 sputum negative pulmonary and 67 extrapulmonary TB cases and one transferred- in new sputum positive case, a total of 217 patients were registered for the treatment. Among these, 206 patients consented to participate in the study.

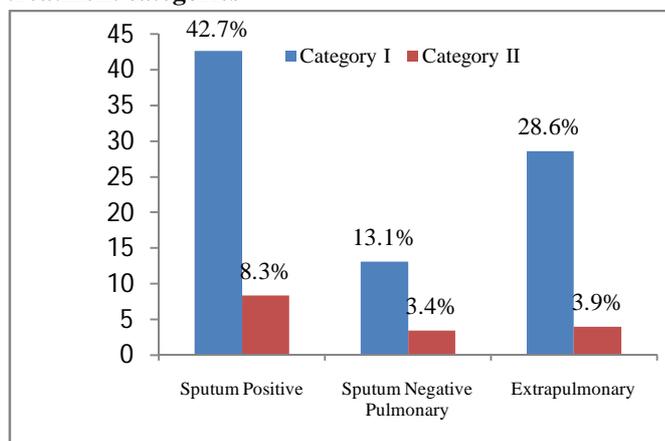
Table 1: Distribution of study subjects among various DMCs under Mandya TU (n=206)

DMC	No of subjects	Percentage
MIMS	77	37.4
DTC	63	30.6
Maddur	51	24.8
Shivalli	11	5.3
Sanjo		
Hospital (Pvt)	4	1.9
Total	206	100

Table 2: Age and sex wise distribution of the study subjects (n=206)

Age Group (in years)	Male	Female	Total (%)
0-14	9	7	16(07.8)
15-29	27	23	50(24.3)
30-44	46	14	60(29.1)
45-59	37	16	53(25.7)
60-74	17	4	21(10.2)
≥ 75	4	2	06 (02.9)
Total	140 (68%)	66 (32%)	206(100.0)

Fig.1 Distribution of study subjects in different treatment categories



Of the total 206 study subjects, 68% were male and 32% were female. Majority of the study subjects, 29.1% were in the age group 30-44 years, followed by the age group of 45-59 years who comprised 25.7% study subjects. Mean and Standard deviation of age of males was 40.74 ± 17.12 years and females was 34.64± 18.85 years. Majority of the study subjects were in the economically productive age group. It is observed that 61.7% study subjects were married, 18% were unmarried and 9.7% were widowed.

According to the type of the family, 58.7% of the study subjects were from joint families and 41.3 % were from nuclear families. 58.7% were illiterates and 18% were educated up to primary school and 14.1% were educated up

to high school. Only 4.9% of the study subjects were graduates.

Table 3: Sociodemographic profile of the study subjects (n=206)

Sociodemographic variable	Male (140)	Female (66)	Total (%)
Marital Status			
Unmarried	30	7	37 (18.0)
Married	87	40	127 (61.7)
Separated	2	2	04 (01.9)
Divorced	1	1	02 (01.0)
Widowed	11	9	20 (09.7)
Not Applicable*	9	7	16 (08.7)
Type of Family			
Nuclear	55	30	85 (41.3)
Joint	85	36	121 (58.7)
Education			
Illiterate	79	42	121 (58.7)
Primary	29	8	37 (18.0)
High School	22	7	29 (14.1)
Graduate	7	3	10 (04.9)
Preschool	3	6	09 (04.4)
Occupation			
Labourer	61	18	79 (38.3)
Farmer	35	2	37 (18.0)
Shopkeepers	10	0	10 (04.9)
Employees	7	3	10 (04.9)
Housewife	0	22	22 (10.7)
Others	17	12	29 (14.1)
Not Applicable#	10	9	19 (09.2)
Socio Economic Status**			
Class II	5	5	10 (4.9)
Class III	24	20	44 (21.4)
Class IV	82	34	116 (56.3)
Class V	29	7	36 (17.5)
Area of residence			
Urban	58	34	092 (44.7)
Rural	82	32	114 (55.3)
Type of house			
Kutchha	34	13	47 (22.8)
Pucca	106	53	159 (77.2)

*This group consists of children up to age 15 years. ** According to modified B G Prasad classification June 2014. # This group consists of subjects up to age of 16 years, who are not working.

According to the National classification of occupations 2004, India, labourers come under Division 8, farmers come under Division 6, shopkeepers come under Division 5, employees come under Division 4, housewives & others who are not employed are treated as unclassified. Of the study subjects 38.3% were labourers, 18% were

farmers and 14.1% were persons included in others as they did not specify being engaged in any occupation.

Table 4: Distribution of study subjects in Category II according to the type of case

Type	Sputum positive Pulmonary (%)	Sputum negative Pulmonary (%)	Extrapulmonary (%)	Total (%)
Relapse Treatment after default	11(33.3)	06(18.8)	04 (12.5)	21 (65.6)
Others	05 (15.7)	0	0	05 (15.6)
Total	01(3.1)	01 (3.1)	04 (12.5)	06 (18.8)
Total	17 (53.1)	07 (21.9)	08 (25.0)	32(100)

Table 5: Distribution of the study subjects according to HIV Status in category I and II

HIV Status	Category I (%)	Category II (%)	Total (%)
Reactive	32 (18.4)	11 (34.4)	43 (20.9)
Non-reactive	142 (81.6)	21 (65.6)	163 (79.1)
Total			

Table 6: Distribution of the study subjects according to HIV Status in different categories of new cases

HIV Status	Category I (New Cases)			Total
	Sputum positive Pulmonary (%)	Sputum negative Pulmonary (%)	Extrapulmonary (%)	
Reactive	12 (37.5)	06 (18.7)	14 (43.8)	32 (100.0)
Non-reactive	76 (53.5)	21 (14.8)	45 (31.7)	142 (100.0)
Total	88	27	59	174

Majority 56.3% of the study subjects belong to socio-economic status class IV, followed by class III 21.4% and 17.5% from class V. Study subjects belonging to class II were 4.9%. None of the study subjects were from class I and 55.3% were from rural area and 44.7% were from urban area. Majority of study population 77.2% were living in pucca houses and 22.8% lived in kutchha houses.

20.9% study subjects were HIV reactive. The proportion of reactive subjects was more, 34.4% in category II compared to 18.4% in category I. Of the newly diagnosed TB patients who were HIV reactive 14 (43.8%) had extrapulmonary TB, 12(37.5%) were sputum positive TB and 6 (18.7%) were sputum negative pulmonary TB cases.

DISCUSSION

Out of 206 study subjects studied, 68.0% were male and 32.0% were females. Of the study subjects, 24.3% were in the age group of 15-29yrs, 29.1% were in the age group of 13-44yrs and 25.7% were in the age group of 45-59 years. Majority of the study subjects were distributed in the economically productive age group. There were 16 (9.2% of new cases) children who were aged up to 14

years. The Global TB Report 2014 has stated that the highest burden of TB is observed among people aged 35-54 years old who are the most economically productive age group which is similar to our study findings.¹ There were 9.2% (of new cases) children who were aged up to 14 years. The Annual Status Report, TB India 2014 states that 5 % of the new cases are in the pediatric age group of 0-14 years.²

In a study conducted by Chaya Mittal & Gupta S C in Agra city, majority of the study subjects 65.8% were in 16-45 years age group.⁸ In a study conducted by Olarewaju et al in South Western Nigeria, the total mean age for male patients was 43 ± 19 years and that of the female group it was 40 ± 17 years and the total mean age group is 42.0 ± 19 years.⁹ In our study the mean and Standard deviation of age of males was 40.74 ± 17.12 years and females was 34.64 ± 18.85 .

With regard to the marital status, 61.7% were married, 18% were unmarried, 9.7% were widowed. 41.3% belonged to nuclear family and 58.7% were from joint families. similar findings were seen in a study done by T S Bam et al where 40 (67.8%) were married and 14 (23.7%) were single.¹⁰

This may be due to the fact that people who were married may visit health care centre early compared to those who were unmarried.

More than half of the study subjects (58.7%) were illiterates. Illiteracy is one of the major social factor for tuberculosis. In a study by P G Gopi et al conducted in a rural tuberculosis unit of South India, 40% of the study subjects were illiterates and 60% were literates.¹¹ In a study conducted by P Mishra et al in Nepal the illiterates were 42.5%.¹²

Out of 206 study subjects 38.3% were labourers, 18% were farmers and 14.1% were unemployed. In a study conducted by Kulkarni P Y et al in Mumbai on Non-adherence of new pulmonary TB patients of the study subjects, 38.1% were unemployed and 62.1% were employed.¹³ In our study majority were either manual labourers or farmers as the district is mainly dependent on agricultural income.

In present study, 56.3% subjects belonged to socio-economic status class IV and 21.4% class III. None of the study subjects were from class I. In a study conducted by P Mishra et al, 62.5% of the study subjects belonged to lower SES and 32.5% belonged to medium SES and 5% belonged to higher SES.¹² In a study done in Mumbai by Suparna Bagchi et al, 52.6% belonged to SES class IV & V, 16.7% belonged to class III and 30.7% belonged to SES class II respectively.¹⁴ It shows that lower socio economic status people are more affected comparatively due to the poverty and poor housing conditions.

In our study 55.3% were from rural area & 44.7% from urban area. Most(77.2%) of study population were living in pucca houses. In a study conducted by M Uplekar et al in Maharashtra on TB patients 57.8% of the study subjects were from rural area and 42.2 % were from urban area.¹⁵

Treatment Categories

More than three fourth (84.4%) of the 206 study subjects were registered for category I treatment and 15.6% were registered for category II treatment. Of the category I, 42.7% were new sputum positive cases, 13.1% were sputum negative pulmonary cases and 28.6% were extra pulmonary TB cases. Among the category II, 8.3% were sputum positive, 3.4% were sputum negative pulmonary cases and 3.9% were extra pulmonary cases. According to a study by Shikha Jain et al in Ahmedabad city, 88.9 % belonged to category I and 11.1% were category II or re treatment cases which is similar to our findings.¹⁶ A study by Dilip D. Motghare et al in Goa, 66.5% of patients had pulmonary tuberculosis, 31.9% had extrapulmonary TB while 1.6% had combination of pulmonary and extra-pulmonary TB. As far as type of Tuberculosis cases was concerned 75.8% were new cases, 13.2% were relapse cases, 5.5% were treatment after default, and 2.2% were failure cases.¹⁷

Study subjects in Category II according to the type of cases

Among the study subjects who were classified as (retreatment) category II, 65.6% were due to relapse, out of which 33.3% were sputum positive. All the study subjects who were started on retreatment following default during the previous treatment were sputum positive. In a study conducted by Solomon Sisay et al in Gambala region of Ethiopia, among the retreatment cases 6.4% were due to relapse, 5.3% were due to default and 0.9% were due to failure.¹⁸

Study subjects according to HIV Status in category I and II

Out of 206 study subjects, 20.9% study subjects were HIV reactive. The proportion of reactive subjects was more, 34.4% in category II compared to 18.4% in category I. According to Global TB report 2014, 13% of the people who developed TB were HIV positive.¹ According to annual status report of TB India 2014, in 2013 among the TB patients registered 63% were tested for HIV and 5% were found to be HIV positive.²

In their study on treatment outcome of Tuberculosis Patients at Gambella Hospital, Southwest Ethiopia Getahun Asebel et al found that 24.22% were HIV positive.¹⁹ It reveals that TB is more common among those who are infected with HIV. Suresh Shastri et al in their retrospective study in Karnataka found that nearly three-quarters 73.2%, of all co-infected patients had pulmonary TB. Of these, 46% were sputum positive for acid fast bacilli. A majority of the patients (87%) were new TB infections while 9.6% were those who had either defaulted treatment, received incomplete treatment, or those who had relapsed.²⁰

Conclusion Majority of the study subjects were in the economically productive age group and were males. More than half of them were illiterates, were from rural area and from low socio economic status. Hence there is need to improve the socioeconomic status, educational status and

living conditions to bring down the prevalence of tuberculosis in the country.

Acknowledgement

We are thankful to our faculty members for their guidance and support and health workers of DOTS centre, Mandya for their help & support.

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Conflict of Interest: None

Source of funding support: Nil

How to cite this article: Ravikumar MS, Manuja LM, Harish BR. Socio demographic profile of patients on Directly Observed Treatment Short Course Chemotherapy in Mandya Tuberculosis Unit, Karnataka. Nat J Res Community Med 2018;7(1):60-65.

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