



Economics of tuberculosis – Patient’s perspective

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Abstract

Background: Tuberculosis is a major cause of suffering since ages and times immemorial. Tuberculosis control activities are present in India since more than 50 years. Our efforts in combat against this age old disease need constant updating in the strategy to tackle it from all perspectives.

The national tuberculosis control programme provides various facilities to support patients, families and communities, logistics management, direct data transfers, incentives to provide direct beneficiary transfer and many others. In Spite of giving free diagnostic test and ATT drugs, tuberculosis patients have other medical and non-medical expenses which are not covered in the RNTCP program. There are certain social and economic factors influencing the early detection and treatment of tuberculosis. This study focuses on the financial implications of tuberculosis on the patient and their family.

Objectives: To assess the financial burden of tuberculosis among these patients.

Methodology: A hospital based cross sectional study.

Study duration: August 2017 to September 2019.

Source of data: Clinically or microbiologically diagnosed tuberculosis patients on antitubercular treatment, admitted in Yenepoya Medical College Hospital and those willing to participate in the study were enrolled. Study participants were enrolled after ethical clearance and informed consent. Relevant demographic data was obtained from the patient. Pre designed semi structured questionnaire to record the medical, nonmedical costs of the patient and companion was used to collect data.

Sampling method: Purposive sampling.

Sample size: Sample size calculation is done using G power software with level of significance alpha = 5%. Effect size D = 0.21. Sample size is 200.

Inclusion criteria: Patients who are diagnosed as tuberculosis and admitted in Yenepoya Medical College Hospital aged above 18 yrs are included in the study.

Exclusion criteria: Patients not willing to participate in the study.

Summary: Study population consisted of male predominance even though the tuberculosis disease per se does not have any gender predominance. Majority of the study population was from rural background. Close to 50 % of patients lost their job due to tuberculosis. Majority of the study population was with an income of less than Rs 10000, with mean hospitalization duration of 6 days. They had healthcare expenditure close to 95% of their monthly income leading to financial burden to them and their family members, resulting in debts in 39% of the study population. There is no association between a) area of residence (urban/rural) and total health care expenditure, b) area of residence (urban/rural) with number of days of hospitalization, c) area of residence(urban/rural) and amount borrowed.

Conclusion: Along with the morbidity and mortality that results out of tuberculosis, patients also have medical and non-medical expenses causing significant financial burden in patients' families especially in the lower income strata which needs due attention.

Keywords: Tuberculosis, financial condition, expenditure, loss of job, poverty, out of pocket expenditure.

Introduction

Tuberculosis is a major cause of suffering since ages and times immemorial. The disease is so old that mention of the disease is seen in age old ayurveda scripts. Tuberculosis claims an estimated 4,80,000 lives every year and more than 1,400 lives every day¹. This stresses upon the impact of the disease on the country. A problem this large requires a large scale solution. Tuberculosis control activities are present in India since more than 50 years. Started in the form of National

Tuberculosis Programme, it was improvised to form RNTCP I in 1997 after WHO announces DOTS. Further improvised to RNTCP II in 2006 or simply called as RNTCP, to consolidate the gains achieved in RNTCP- I and to initiate services to address TB/HIV, MDR-TB and to extend RNTCP to the private sector. World health assembly recognized tuberculosis as a major health problem in 1991² and suggested two targets for national tuberculosis programme, to detect 70% of smear new smear positive cases and to cure 85% of such cases. World health organization later in the year 1993 recognized the lethal impact of the disease and declared tuberculosis as a "Global Emergency"³. DOTS strategy was launched in 1994 is the mostly widely accepted strategy throughout the globe.

The national program for control of tuberculosis offers benefits such as free early diagnosis and treatment of tuberculosis cases in the community, early notification, incentives, support to patients, families and communities, future enhancements under NIKSHAY for patients' support, logistics management, direct data transfers, adherence support and to support interface agencies to expand the reach, incentives to provide direct beneficiary transfer and many others. In Spite of all these efforts, there are certain social and economic factors influencing the early detection and treatment of tuberculosis. Tuberculosis patients have other medical and non-medical expenses which are not covered in the RNTCP program. They also have a significant delay in the diagnosis of TB from the onset of symptoms causing an economic burden on the individual and family.

Justification / need for study

There is a need to understand the socio economic condition of patients affected by tuberculosis in order to give appropriate advice, ensure compliance in treatment and hence achieve good treatment outcome.

Aims: To find out the financial burden due to tuberculosis in patients admitted at a medical college hospital.

Objectives

To assess the economic situation of patients and financial burden of tuberculosis

Materials and methods

Study Design : A hospital based cross sectional study

Study setting: Yenepoya Medical College Hospital, Mangaluru, Karnataka.

Study duration: August 2017 to September 2019.

Source of data: Clinically or microbiologically diagnosed tuberculosis patients on antitubercular treatment, admitted in Yenepoya Medical College Hospital and those willing to participate in the study were enrolled. Study participants were explained in detail about the study and informed consent was obtained from each patient. Relevant demographic data like name, age, sex, place, occupation, socio-economic status and education was obtained from the patient. Pre designed, semi structured questionnaire to capture the medical, nonmedical expenses including those spent on companion/guardian were used for data collection.

Table 1: gender and type of residence

	type of residence			Total
	Urban		Rural	
sex	M	33	98	131
	F	6	63	69
Total		39	161	200

161(80.5%) patient were from the rural background and 39(19.5%) patients were from the urban background.

The present study was carried out with patients more than 18 yrs with tuberculosis attending Yenepoya Medical College Hospital after obtaining the Ethical Committee clearance.

Sampling method: Purposive sampling

Sample size : Sample size calculation is done using G power software with level of significance alpha = 5%
Effect size D = 0.21

Minimum sample size required is 200

Details of study like questionnaire: questionnaire attached

Inclusion criteria: Patients who are diagnosed as tuberculosis and admitted in Yenepoya Medical College Hospital aged above 18 yrs are included in the study.

Exclusion criteria: Patients not willing to participate in the study.

Results and discussion

Descriptive Statistics A total of 200 patients were included in the study after considering inclusion and exclusion criteria.

Of the 200 patients 131(65.5%) were males and 69 (34.5 %) were females. The age group among the patients studied varied from 18 to 85 years with mean age of 42.78 with standard deviation 16.89.

Table 2 : Gender with loss of job

		If Unemployed- Reason Is TB		Total
		Yes	No	
Sex	M	77	54	131
	F	26	43	69
Total		103	97	200

Out of 200, 103 patients suffering from tuberculosis lost their job due to tuberculosis.

Table 3: Type of residence and first treatment point

		first treatment point					Total
		District	Private	Healthcare	Pharmacy	Herbalist	
type of residence	Urban	26	11	1	1	0	39
	Rural	118	36	1	3	3	161
Total		144	47	2	4	3	200

Out of 200 patients only 144 patients visited a government hospital for early diagnosis, where as the remaining 56 patients visited private, healthcare centers, pharmacy, herbalist leading to health care expenditure and delay in diagnosis.

Table 4: Type of residence and total family income

		total family income			Total
		1-9999	10000-19999	>20000	
type of residence	Urban	37	2	0	39
	Rural	151	6	4	161
Total		188	8	4	200

39 patients were from urban background and 161 from the rural area. Majority from the rural area with an income of less than Rs 10000.

Table 5: Type of residence and total healthcare expense

		Total Expenses				Total
		1-9999	10000-19999	20000-29999	>30000	
type of residence	Urban	31	5	2	1	39
	Rural	118	31	6	6	161
Total		149	36	8	7	200

Average healthcare expenditure which includes treatment, investigations and was Rs 9345. 149 patients had to spend out of pocket for their healthcare. 44 Patients had to spend more than 10000 for hospital expenses.

Table 6: Type of residence and approximate family expense

		Approximate Family Expense			Total
		1-2999	3000-5999	>6000	
type of residence	Urban	30	9	0	39
	Rural	134	23	4	161
Total		164	32	4	200

Apart from patient health care, their bystanders had other expenses such as travel, food and accommodation for the family members. Mean family expenditure Rs 1923.000

Table 7: Type of residence and number of days of hospitalization

		Number of days patient was hospitalized			Total
		1-9 days	10-19 days	>20 days	
type of residence	Urban	34	3	2	39
	Rural	141	15	5	161
Total		175	18	7	200

Majority of the patients in the study population were hospitalized between 1 to 10 days with a mean hospitalization of 6 days.

Table 8: Type of residence and amount borrowed

		amount borrowed				Total
		No debt	1-9999	10000-19999	>20000	
type of residence	Urban	28	0	8	3	39
	Rural	94	8	30	29	161
Total		122	8	38	32	200

Out of 200 patients, 78 patients had to borrow for their health care expenditure. 38 patients borrowed amounts between Rs 10000 and Rs 20000 and 32 patients borrowed more than Rs 20000.

Table 9: Type of residence and total loss of pay (duration of unpaid leave multiplied by monthly income)

		not working since how long and estimated take home per Month before TB			Total
		1-9999	10000-19999	>20000	
type of residence	Urban	3	17	3	23
	Rural	36	36	15	87
Total		39	53	18	110

Table shows the total loss to the patient in terms of the total duration of loss of work days multiplied by the average income per month in the urban and the rural population

Table 10: Total family income and total expenses

	Total Expenses				Total	
	1-9999	10000-19999	20000-29999	>30000		
Total Family Income	1-9999	145 97.3%	31 86.1%	7 87.5%	5 71.4%	188 94.0%
	10000-19999	4 2.7%	4 11.1%	0 0.0%	0 0.0%	8 4.0%
	>20000	0 0.0%	1 2.8%	1 12.5%	2 28.6%	4 2.0%
Total		149 100.0%	36 100.0%	8 100.0%	7 100.0%	200 100.0%

Table shows the family income and the healthcare expenditure of the study population. Majority of the patients (145(97.3%)) in the income range of upto Rs 10000 per month had an expenditure of up to Rs 10000 towards healthcare.

Table 11: Number of Visits

Number of visits in days	Frequency	Percent
1	25	12.5
2	105	52.5
3	46	23.0
4	20	10.0
>=5	4	2.0
Total	200	100.0

105 out of 200 patients i.e 52% had more than 2 consultations with different health care providers leading to delay in diagnosis and financial burden

Table 12: Mean and Standard deviation of variables

Variables	Mean	Standard deviation
Age	42.780	16.8934
Total family income	9345.000	1811.7359
Total family expenditure	8760.000	3824.3336
Number of days of delay	38.42	48.067
Distance of nearest government hospital in minutes	21.500	12.9553

Total health care expenses	8872.050	9145.4253
Total days of hospitalisation	6.040	4.6342
Approximate Hospital bill	7426.520	6937.1362
Approximate family expense	1923.000	1367.4137

Table shows the mean and standard deviation of various parameters considered in the study

Table 13: Chi square test is performed to find out the association between the various parameters

Variables	Chi square	Df	P value
Type of residence with total expenses	1.159204	3	0.762805
Type of residence with total number of days of hospitalization	0.459582	2	0.794700
Type of residence with amount borrowed	5.011563	3	0.170952

We found out that there is no association between area of residence and total health care expenditure, area of residence with number of days of hospitalization, area of residence and amount borrowed.

Summary

1. Study population consisted of male predominance even though the tuberculosis disease per se does not have any gender predominance.
2. Majority of the study population was from rural background.
3. Close to 50 % of patients lost their job due to tuberculosis.
4. Majority of the study population with a income less than Rs 10000, with mean hospitalization duration of 6 days had healthcare expenditure close to 95% of their monthly income leading to a financial burden to them and their family members resulting in debts in 39% of the study population.
5. There is no association between
 - Area of residence and total health care expenditure,
 - Area of residence with number of days of hospitalization,
 - Area of residence and amount borrowed.

Conclusion

Along with the morbidity and mortality that results out of tuberculosis, patients also have medical and non-medical expenses causing significant financial burden in patients' families especially in the lower income strata which needs due attention.

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