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Original Research Article.

Study on Economic Impact of Pulmonary Tuberculosis Treatment of Patient Under DOTS Programme or Private Practitioner in a Rural and Urban Population

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ABSTRACT

Introduction: The Revised National TB Control Programme (RNTCP), a state-run tuberculosis (TB) control initiative of the Government of India, has been very successful in implementing the DOTS strategy in India. It is based on sputum smear diagnosis and a reliable supply of good quality drugs, both provided at no cost to the patient.

Methodology: In this cross-sectional study, the data was collected from 150 eligible patients during the period January 2018 to July 2019, from a peripheral DOTS TB centre and 5 private medical practitioners representing both private and government clinics. 75 patients enrolled from private medical practitioners were not enrolled under RNTCP programme.

Result: 150 patients were enrolled in this study. 75 patients were enrolled in DOTS Programme in a Rural Dots Centre while remaining 75 were investigated and treated by private practitioners. Both groups of patients were given standardised Category 1 regimen. None of the patient had received previous TB treatment.

Conclusion: This study concludes that reducing out-of-pocket costs to patients may increase the access to the poor people and thus promoting the universal access of TB care services as well.

Keywords: DOTS, Pulmonary Tuberculosis, RNTCP Programme.

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INTRODUCTION

Tuberculosis (TB) imposes a significant impediment to social development in India, the country with the greatest epidemiological burden of TB in the world.[1] The prevalence of tuberculosis was estimated to be 10.5 million, alone 1.8 million new cases of TB arise annually in India.[2,3]

There were an estimated 1.3 million (range, 1.2–1.4 million) deaths from TB among HIV-negative people in 2017 and an additional 300,000 (range, 266,000–335,000) deaths from TB among HIV-positive people. India accounted for 32% of global TB deaths among HIV-negative people, and 27% of the combined total TB deaths in HIV-negative and HIV-positive people.[4]

Though the available data suggest that the TB epidemic may be on the decline, India continues to be the highest TB burden country in the world in terms of the absolute number of incidence cases each year. Mortality due to TB is the third leading cause of years of life lost, in the country. The estimated incidence (new TB cases per year) is 2.8 million cases in 2015 (217 per 100,000 population) with a confidence interval of 1.47 to 4.65 million. TB kills an estimated 480,000 Indians every year and more than 1,400 every day[5]. Approximately 5% of the incident TB cases have co-morbidity with HIV, though this proportion varies depending on the HIV prevalence of the population.[5]

The annual economic loss to the country is estimated to be US$3 billion, with over 70% of cases occurring in the most economically productive age group (15–54 years). In India, TB is associated with negative social stigma, causing 100,000 women to be abandoned by their families and 300,000 children to leave school every year.[6]

The Revised National TB Control Programme (RNTCP), a state-run tuberculosis (TB) control initiative of the Government of India, has been very successful in implementing the DOTS strategy in India. It is based on sputum smear diagnosis and a reliable supply

of good quality drugs, both provided at no cost to the patient. However, the cost of smear microscopy and drugs is only a fraction of the actual costs associated with TB disease in India. The patient pays directly, for costs associated with diagnostic and treatment visits, hospital admissions and additional treatments recommended by health providers and indirectly, due to income lost during the entire duration from diagnosis to treatment. We examined costs borne by newly treated pulmonary TB patients during the pre-diagnostic phase and 6 months of treatment in Uttar Pradesh, India.

METHODOLOGY

The present study was done to assess costs of care associated with TB in the low and middle economic group of families. 2 local volunteers were appointed and trained in a standardised method to obtain informed consent and to interview the patient.

In India, about 80% of the population lives in rural areas. The main occupation is agriculture, and workers receive daily wages. Transport facilities are mostly poor, with many unpaved roads. Urban areas are well connected both by rail and road, but travel expenses are higher in these areas. The occupational profile of the urban population is different from that of the rural population; the majority are self-employed or salaried. The prevalence of tuberculosis is similar in both rural and urban areas of India[7].

Study Design & Period

In this cross-sectional study, the data was collected from 150 eligible patients during the period January 2018 to July 2019, from a peripheral DOTS TB centre and 5 private medical practitioners representing both private and government clinics. 75 patients enrolled from private medical practitioners were not enrolled under RNTCP programme.

Study Population

Inclusion criteria were new out-patients (who have never had treatment for tuberculosis or have taken anti-tuberculosis drugs for less than one month) with CB-NAAT test positive for pulmonary TB, who had received complete TB treatment and also whose HIV statuses were negative.

Tool for Data Collection

A standardised, interviewer-administered questionnaire was translated into Hindi and was used to collect information on demographic and socioeconomic characteristics of patients. The questionnaire also included information on expenditure for the consultation fees, investigations, medicines, travel cost for escort and patient before and during treatment.

Cost Assessed

Consultation fees and money spent on investigations (blood and x-ray) and drugs was classified as medical expenditure. Money spent on travel, lodging, special food and expenditure incurred on persons accompanying the patient was classified as nonmedical expenditure.

Total cost includes the expenditure incurred pre-treatment and during treatment including both medical and nonmedical expenditures. The cost was calculated in terms of Indian rupees. Total treatment cost was calculated only for those patients who completed treatment successfully.

Patients with treatment outcomes such as defaulted, migrated, transferred out and died were not available and hence excluded. Patients who had failed and were on re-treatment were not considered for this analysis.

Patients were interviewed between 1 and 3 months after treatment, and cost data collected was extrapolated to report costs associated with 6 months of treatment.

Data was analysed using the SPSS and checked for errors. In univariate analysis, categorical variables were compared.

RESULTS

150 patients were enrolled in this study. 75 patients were enrolled in DOTS Programme in a Rural Dots Centre while remaining 75 were investigated and treated by private practitioners. Both group of patients were given standardised Category 1 regimen. None of the patient had received previous TB treatment. Of the total 150 patients enrolled, males comprised the majority (60.7%) with median age of 44 years. The demographic & social characteristics of the study population are given in Table 1.

Table 1: Demographic and social characteristic of 150 patients.

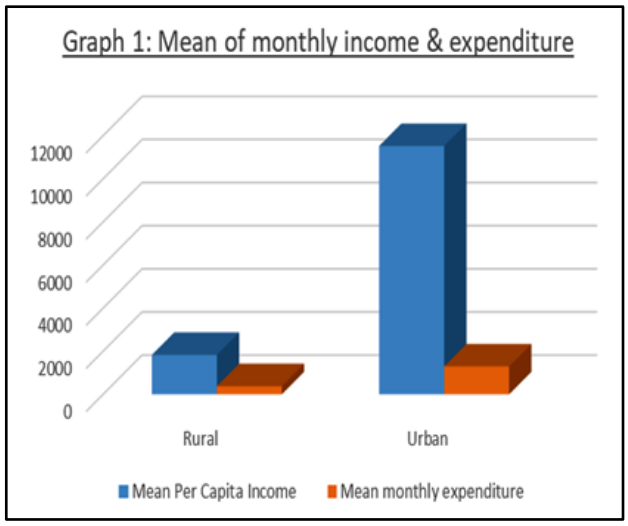
Demographic Character	Variables	Number	Percentage
Community	**Rural**	75	50.0
	Urban	75	50.0
Age	**< 15**	2	1.3
	15 – 25	19	12.7
	26 – 50	95	63.3
	>50	34	22.7
Sex	**Male**	91	60.7
	Female	59	39.3
Family Type	**Joint**	61	40.7
	Nuclear	89	59.3
Family Size	**1 – 4**	86	57.3
	5 – 6	55	36.7
	7+	9	6.0
Education	**Illiterate**	37	24.7
	Intermediate	34	22.7
	Graduation	64	42.7
	Post-Graduation	15	10.0

Table 2: Economic characteristics of rural and urban study population

Characteristics	Number of patients					
	Rural		Urban		Total	
	Male	Female	Male	Female	Male (%)	Female (%)
Occupation						
Business	20	2	12	1	35.2	5.1
Daily wages	3	2	4	0	7.7	3.4
Dependent	4	14	1	16	5.5	50.8
Self Employed	21	1	0	0	23.1	1.7
Service	2	6	24	17	28.6	39.0
Per capita Income (Monthly)						
≤ 1000	12	3	0	0	13.2	5.1
1001 - 2000	24	16	0	0	26.4	27.1
2001 - 5000	13	6	6	3	20.9	15.3
5001 - 10000	1	0	19	14	22.0	23.7
10001 - 20000	0	0	12	13	13.2	22.0
> 20000	0	0	4	4	4.4	6.8
Total number of patients	50	25	41	34	100.0	100.0

Table 3: Expenditure attributes for a TB patient

Expenditure	Rural	Urban
Medical		
Mean	1987	7421
Median	1400	7300
Non-Medical		
Mean	243	319
Median	210	250



Among the study population maximum number of patients belong to age group of 26-50 years (63.3%). 89 (59.3%) of total population had a nuclear family, therefore, the most prevalent family size was that of 1-4 family members (57.3%). 64 (42.7%) out of 150 included patients were graduates. 115 of the 150 patients were earning members of the family. 03 patients had MDR tuberculosis which led to additional expenditure on them.

The economic characteristic of the study population is given in Table 2. 5.5% of males while 50.8% of females were dependent members (students, retired, unemployed). 13.2% males and 5.1% females belonging to rural areas had a monthly per capita income of less than Rs 1000. Patients with higher monthly per capita income were seen in urban areas. 4.4% of males and 6.8% of females had a monthly per capita income of more than Rs 20000.

Cost borne by tuberculosis patients was divided into medical & non-medical attributes. Mean cost for medical attributes in rural patient was Rs 1987, and in urban patients was Rs 7421. While mean for non-medical attributes were Rs 243 and 319 in rural and urban respectively. It is shown in Table no 3.

On splitting costs it was found that urban patients had a higher diagnostic as well as treatment cost as compared to rural patients. Mean difference between diagnostic & treatment costs of urban and rural patients was Rs 2053 and Rs 3381 respectively.

Mean monthly income in rural & urban study population is Rs 1824 & Rs 11520 while mean monthly expenditure is Rs 372 and Rs 1290 respectively. This is shown in graph 1.

DISCUSSION

The present study has documented the overall costs incurred by patients with tuberculosis thus measuring the economic burden on a family having an individual with tuberculosis. Both rural and urban population groups were included in the study. This study is comparable with other studies.[7,8] It is well known that adults aged 15 to 59 years are the most economically productive individuals; they are also the parents on whom the survival and development of children depend. Thus, tuberculosis has the potential to impede the development of both individuals and society.[9]

In terms of sex ratio of patients, this study is compatible with similar studies[10-12], although some studies documented higher numbers of male and almost even numbers of both sexes.

Economic statistics found in this study were similar to a study done by Ramya Ananthakrishnan 2012.[13]

Rural population had total monthly economic burden of Rs 372 (20.4% of monthly income) as compared to Rs 1290 (11.2% of monthly income) of urban population. The similar findings were found by few other studies.[10,12]

In this study both medical and non-medical attributes were documented. It was found that both of these were higher in urban patients as compared to rural population because of incorporation of government services availed by rural patients. While urban patients selected in this study were from private sector and not registered under RNTCP programme benefit, it was observed that patients seeking diagnosis and treatment from private practitioners had a higher expenditure rate as compared to rural patients enrolled in RNTCP programme where their treatment was mostly free and major investigations were covered under RNTCP. The total mean cost for patients was Rs 2230 in DOTS programme. There is a mean saving of Rs 5510 to patients when compared with patients receiving private medical care. Similar findings were reported earlier.[14,15]

CONCLUSION

Present study strongly suggest that RNTCP has proven to be a cost-effective health intervention, with reference to reducing out-of-pocket expenses and indirect costs which indicate that they return early to work, which in turn benefits their families and in the broader perspective contributes to the overall economic and social development of their country. Reducing out-of-pocket costs to patients may increase the access to the poor people and thus promoting the universal access of TB care services as well.

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