Evaluation of Revised National Tuberculosis Control Programme (RNTCP) in Tuberculosis Unit of a Tertiary Care Hospital in Kanpur

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ABSTRACT

Background: New surveillance data from India and other countries has indicated that the global TB epidemic is much larger than it was estimated earlier. India is one of the top six countries that contribute to the global TB burden. Studies regarding managerial indicators of RNTCP are rare.
Objectives: To study the biosocial correlates and treatment outcome of registered cases and to evaluate the Revised National Tuberculosis Control Programme (RNTCP) in Tuberculosis Unit of a tertiary care hospital in Kanpur.
Materials and Methods: A treatment record analysis of TB cases registered at the Tuberculosis Unit of Dr. Murari Lal Chest Hospital, Kanpur during the period of January to December, 2016 was done. Data was recorded in a pre-designed and pre-tested questionnaire and analyzed using standard statistical tools (percentages, chi square test).
Results: The study revealed that maximum number (72.35%) of TB cases were in the 20-60 years age group and were mostly males (61.58%). Most (74.44%) of the cases were from urban areas. The T.U had an annualized case detection rate of 51 cases per 100,000 population, smear conversion rate of 85% and treatment success rate of 63.45%. 29.60% of registered cases were transferred out.
Conclusion: Most of the registered TB cases were in the economically productive age group and were males. The sputum positivity rate was at par with RNTCP norm. The cure rate of T.U was far behind the country's status report.

Key Words: RNTCP, End TB Strategy, Tuberculosis Unit, RNTCP indicators

INTRODUCTION

Tuberculosis (TB) is one of the most ancient infectious diseases caused by Mycobacterium tuberculosis. The population most affected is the young and economically productive one. It is a medical disease with social aspects and is one of the top ten causes of deaths worldwide. New surveillance data from India and other countries has indicated that the global TB epidemic is much larger than it was estimated earlier.

In 2015, the United Nations adopted the Sustainable Development Goals (SDGs) for 2030 and to end the global TB epidemic is one of its targets. In accordance with the SDGs, the World Health Organization (WHO) adopted the "End TB Strategy" which calls for 90% reduction in TB mortality and 80% reduction in TB incidence by 2030, compared with 2015. [1] According to WHO, in 2015 globally, there were an estimated 10.4 million new (incident) cases of TB, of which 5.9 million were males, 3.5 million were females and 1.0 million were children. [1] An estimated 1.4 million deaths were due to TB and an additional 0.4 million deaths from TB among people living with HIV.TB mortality is high given that most deaths are preventable if people can access health care for a diagnosis and the correct treatment is

provided. Globally, though there has been a decline in the incidence rate of TB, the rate is minimal and needs to be accelerated in order to achieve the targets of End TB Strategy.

The South East Asia region has the second highest incidence rate of TB among all WHO regions, following Africa, and India is one of the top six countries that contribute to the global burden. India is the second most populous country in the world and approximately one quarter of the TB cases and deaths worldwide are reported from India. [1] The National Tuberculosis Programme (NTP) that was started in India in the year 1962, was reviewed in 1992 by the Government of India along with other stakeholders as there was no decline in TB burden of the country even after three decades of the programme. In the year 1997, the Revised National Tuberculosis Control Programme (RNTCP) was launched. As a signatory of the World Health Assembly that endorses SDGs and Global End-TB Strategy, India aims for 50% and 75% reduction of incidence of TB and related deaths, respectively, till 2025. [2] Under the 12th Five Year plan, National Strategic Plan (NSP) 2012-2017 was developed which coincided with Phase-III of RNTCP. The new objective is 'Universal Access' to quality diagnosis and treatment for all TB patients in the community. Studies regarding managerial indicators of RNTCP are rare. When RNTCP is moving from one phase to another, more and more operational researches are needed to know whether it is heading towards the right direction as far as pace and quality of implementation of the programme are concerned. Keeping this in view, the present study was conducted to study the biosocial correlates and treatment outcome of TB patients and to evaluate RNTCP in the Tuberculosis Unit of Dr. Murari Lal Chest Hospital, Kanpur.

MATERIALS AND METHODS

The record-based prospective study was conducted at the Tuberculosis Unit (T.U) of Dr. Murari Lal Chest Hospital

which is an associated hospital of G.S.V.M Medical College, Kanpur. Institutional Ethical Committee clearance was obtained. All TB cases registered in the T.U during the period of January-December, 2016 were included in the study.

669 cases of TB were registered during the above mentioned period. Epidemiological information and other related data of TB patients available from treatment register was recorded in a pre-designed and pre-tested questionnaire.

Statistical analysis: The Master table was prepared from the data collected using MS Excel software and analyzed using SPSS software version 18.0. Standard statistical tools (percentages, chi-square test for independence of attributes) were used for analysis and conclusions were drawn accordingly.

RESULTS

Maximum numbers (72.35%) of TB cases registered at the Tuberculosis Unit (T.U) were in the 20-60 years age group (Table 1). Most (61.58%) of the cases were males. Most (74.44%) of the cases were from urban areas.

Table 1: Biosocial correlates of registered cases (N=669)

Biosocial correlates	Cases	%
Age group (in years)		
<20	136	20.33
20-60	484	72.35
>60	49	7.32
Gender		
Male	412	61.58
Female	257	38.42
Place of residence		
Rural	171	25.56
Urban	498	74.44
Total	669	100

Treatment outcome records of 481 cases were available, out of which 17 cases were diagnosed as MDR-TB (Table 2a). Records of 188 out of 198 transferred out cases were not available. Out of the total 464 cases, 344 (74.14%) were new cases started on Category I regime and 120 (25.86%) were re-treatment cases started on Category II regime. Out of 344 cases started on Category I regime, majority (78.20%) of the cases were cured or treatment completed

and 12.21% defaulted. Out of 120 cases started on Category II regime, 54.17% were cured or treatment completed and 27.50% defaulted. As a whole, 16.16% of the cases defaulted.

Table 2a: Available treatment outcome of registered cases (n=464)

Treatment category	Treatment outcome**					Total* (%)
	Cured (%)	Treatment completed (%)	Default (%)	Failure (%)	Died (%)	
Category I	115 (33.43)	154 (44.77)	42 (12.21)	3 (0.87)	30 (8.72)	344 (100)
Category II	39 (32.50)	26 (21.67)	33 (27.50)	5 (4.17)	17 (14.17)	120 (100)
Total*	154 (33.19)	180 (38.79)	75 (16.16)	8 (1.72)	47 (10.13)	464 (100)

*4 cases of Category I regime and 13 cases of Category II regime were diagnosed as MDR-TB **Treatment outcome records of 188 out of 198 transferred out cases were not available

Maximum numbers (71.98%) of cases were cured or treatment completed while treatment was unsuccessful in 28.02% cases. The association between treatment outcome and treatment regime was found to be statistically significant ($p<0.001$) (Table 2b).

Table 2b: Treatment outcome according to treatment regime (n=464)

Treatment outcome	Treatment regime		Total (%)	Test of significance (χ^2) C.I=95%, df=1
	Category I (%)	Category II (%)		
Treatment successful (Cured+ Treatment completed)	269 (78.20)	65 (54.17)	334 (71.98)	$\chi^2 = 24.29$, $p<0.001$
Treatment unsuccessful (Failure+ Default+ Died)	75 (21.80)	55 (45.83)	130 (28.02)	
Total	344 (100)	120 (100)	464 (100)	

Out of 5 lakh population served by the T.U, 256 New Sputum Positive (NSP) cases were detected in the year 2016. So, the annualized case detection rate for NSP cases achieved by the T.U was 51 per 100,000 populations which were close to the RNTCP target (Table 3). Out of 529 New Pulmonary cases, 256 cases were NSP. So, the proportion of NSP out of total New Pulmonary cases was 48.39% which was close to the RNTCP target of 50%. Out of 256 NSP cases, sputum smear reports of 166 cases were available. 141 NSP cases became sputum smear negative. So, the smear conversion rate achieved by the T.U was 85% approximately which was equal to the RNTCP target. Treatment outcome records of 197 cases out of 256 NSP cases were available. Out of 197 available records, 125 cases were cured and 11 cases treatment completed. So, the treatment success rate achieved by the T.U was 63.45% which was quite less than the RNTCP target of 85%.29.60% of registered cases were transferred out from the T.U. This was far higher than the RNTCP target of <3%.

Table 3: Analysis of RNTCP indicators

RNTCP indicators	RNTCP targets	Achievements of Tuberculosis Unit
Annualized case detection rate for NSP cases	53 cases per 100,000 population	51 cases per 100,000 population
Proportion of NSP out of total New Pulmonary cases	50%	48.39%
Smear conversion rate	85-90%	84.93% (≈85%)
Treatment success rate	85%	63.45%
Transferred out	<3%	29.60%

DISCUSSION

The present study shows that most (72.35%) of the TB cases registered belonged to 20-60 years of age group. In a study conducted in Lucknow by Mahesh *et al*, majority (81.00%) of the patients belonged to age group of 15-44 years. [3] N Pandit in Anand district of Gujarat, found that majority (85.00%) of study population was in the productive age group of 15-55 years. [4] In a study conducted in Kottayam, Kerala by P Sukumaran *et al* 64.00% patients were found in the economically productive age group (20-50 years) while Sanjay Gupta in a study in Meerut, UP found that most (55.00 %) of the patients belonged to the age group 20-29 years. [5,6]

In the present study, 61.58% of TB cases were males and 38.42% were females. Almost the same trend was observed in the studies conducted by Mahesh *et al* and N Pandit where percentages of male study subjects were 57.80% and 63.00% respectively. [3,4] Similar trend was observed by S Bisoi *et al* in Howrah district of West Bengal (64.00% males and 36.00% females) and Masthi NRR *et al* in Bangalore, Karnataka (64.77% males and 35.22% females). [7,8] This might be due to greater exposure of males to the various risk factors of TB.

In the present study, maximum cases (74.44%) were from urban areas which might have been due to the location of the T.U.

In the present study, maximum numbers (74.14%) were new cases while 25.86% were re-treatment cases. Similar trend was seen in a study conducted by S Bisoi *et al* where 78.3% were new cases and 21.7% were re-treatment cases. [7] The failure rate was 1.72% and as per RNTCP guidelines, failure rate must be less than 4.00%. But default rate in the present study was 16.16%. As per RNTCP guidelines, default rate must be less than 5.00%. However, the finding is almost similar to those of other studies carried out in India, especially from Uttar Pradesh. In a study by Mittal C *et al* in Agra, Uttar Pradesh, default rate was observed to be 15.10%. [9] Also in study of Mahesh *et al* in Lucknow, default rate was reported to be 10.60%. [3] In our study, treatment success rate (cured and treatment completed combined) was 71.98%.The operation research studies conducted by V Singh *et al* in New Delhi found the cure rates to be 71% and 75%. [10] In the studies conducted by Mahesh *et al*, N Pandit and Tahir M *et al*, the compliance rates were 89.40%, 93.00% and 86.00% respectively. [3,4,11] This might be due to unavailability of treatment outcome records of transferred out cases.

In the present study, treatment was successful in greater number of cases started on Category I (78.20%) than in Category II (54.17%). This shows that treatment compliance was greater among patients started on Category I regime. The association between treatment regime and treatment outcome was found to be statistically significant.

Approximately, 75 NSP cases occur per 100,000 populations per year in India. [12] The global and the national target is to detect at least 70% of the total estimated cases i.e. 53 cases per 100,000 per year. Annualized case detection rate of 51 NSP cases per 100,000 population achieved by the T.U was close to the RNTCP target of 53 per 100,000 population. Proportion of NSP out of total New Pulmonary cases (48.39%) was close to the RNTCP target of 50%. The smear conversion rate of 85% achieved by the T.U was equal to the RNTCP target. This is similar to the study conducted by B Gopikrishna *et al* in Tirupati, Andhra Pradesh where smear conversion rate at the end of treatment was 85%. [13] However, treatment success rate of 63.45% was much lower than the RNTCP target of 85%. Similar trend was seen in a study conducted by S Bisoi *et al* where cure rate of new sputum-positive pulmonary TB cases was 53.8%. [7] Transferred out rate (29.60%) in the present was far higher than the RNTCP target of <3%.

CONCLUSION

Most of the registered TB cases were in the economically productive age group and were males. RNTCP indicators show the performance of a tuberculosis unit. The sputum positivity rate was at par with RNTCP norm, which signifies that the quality of sputum microscopy was satisfactory. The cure rate of T.U was far behind the country's status report and RNTCP norm of 85%. The probable reasons might be high default rate, high transferred out rate and unavailability of treatment outcome records of most of the transferred out cases. Thus there is need of educating and creating awareness among the registered cases for better treatment of tuberculosis and reduction in defaulter rate.

Also, there is need of taking measures for improving feedbacks from various DOTS centers.

Recommendations:

Defaulters constitute pool of infectors in the community and also add to the problem of MDR-TB. Follow up of all the defaulters to find out the reasons for default and the rectification of reasons will help in reducing the rate of defaulters. Health education of community at large is essential, with a view to promote community awareness, community co-operation and community participation in TB control. Electronic reporting system will help in improving feedbacks from various DOTS centers regarding transferred out cases and in better evaluation and monitoring of the programme.

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