Original Article

Notified or missed cases? An assessment of successful linkage for referred tuberculosis patients in South India

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ABSTRACT

Background and Objectives: Although tuberculosis (TB) is a notifiable disease in India, most of the cases of TB are either not recorded or reported. Among diagnosed cases, for improving reporting, proper feedback on referral outcome needs to be ensured to all health care providers who refer cases to the public health system. **Materials and Methods:** All the received feedbacks for TB patients referred for treatment from July 2013 to December 2013 were analyzed. Feedback reports including referral date, the age and sex of patients, type of disease, and date of treatment initiation were examined. **Results:** Of the total 1,259 referred TB patients during the study period, feedback was received for 54% of them. Only 42.3% (n = 532) of the referred patients were successfully linked at the treatment facility. Seven (0.6%) referred patients died before the initiation of treatment while 3.7% migrated, 2.4% gave the wrong address, 1.0% started private treatment, and 0.6% were nontraceable; in 3.2% cases only was the TB number given. Feedback was significantly associated with sex, age group, type of treatment, disease type, and place of residence. **Conclusion:** The feedback received for referred patients was poor and for improving the care of TB patients, there is a need to strengthen the feedback mechanism in Revised National Tuberculosis Control Programme (RNTCP) for referred patients.

Key words: Feedback outcomes, India, Revised National Tuberculosis Control Programme (RNTCP)

INTRODUCTION

India ranks first among the high tuberculosis (TB) burden countries. In 2012, out of the estimated global annual incidence of 8.6 million TB cases, 2.3 million were estimated to have occurred in India.[1] With 26% of the total TB incidence cases, India has one of the largest and well-run national TB control programs in the world. Although, India's TB control program is on track as far as reduction in disease burden is concerned,[2] it is essential to have complete information of all TB cases to ensure proper case management, reduce TB transmission and address the problems of emergence of spread of drug-resistant TB.

The Government of India declared TB as a notifiable disease in 2012 but nearly one-third of the three million missed cases

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worldwide are from India.[3,4] One of the major policy decisions taken by the Revised National Tuberculosis Control Programme (RNTCP) was to change the focus of the new sputum positive (NSP) case detection objective of at least 70% to the concept of universal access to good quality care for TB patients.[5] To reach the unreached, Stop TB Partnership has also focused on diagnosis, treatment, and cure for all.[6] To achieve universal access to TB treatment, special attention needs to be paid to the referral and feedback mechanism already in place. Although referral and feedback for TB patients is an agenda item in every state level RNTCP quarterly review and boarder state meeting, more importance is usually given to the case detection.

For improving reporting, proper feedback to all health care providers who refer cases to the public health system should be ensured.[7] The referring unit should receive the feedback on patients referred to other tuberculosis units (TUs) in the same district within 14 days and for patients referred outside the district/state within 1 month.[8]

In India, national and regional task forces has been set up to involve all public and private medical college hospitals, with related financial aid for operating hospital-based TB clinics, which contribute up to 15% of national case reporting from these facilities.[9] From medical colleges, apart from diagnosis and treatment, a large number of cases are referred for treatment to other reporting units/peripheral health institutions (PHIs) and their feedback is received. Feedback of the TB patients referred from medical colleges to PHIs for treatment initiation ranges 62-73%.[10] The overall aim of feedback is to confirm that the referred case has reached and started on appropriate treatment at the receiving unit. Apart from routine feedback, the type of feedback including successful linkage for referred TB patients is important.

This study was conducted to assess whether the TB patients referred from the medical colleges of Puducherry, India actually present themselves, are registered, and initiate treatment at the health facilities to which they are referred. An attempt to describe the approaches that can be used to strengthen existing TB patient referral mechanisms from medical colleges under RNTCP in India was also made.

MATERIALS AND METHODS

Study design

This is a descriptive study conducted through a retrospective record review related to the referral of TB patient for initiation of treatment.

Study setting and population

With a population of 1.2 million and four small unconnected districts, the union territory of Puducherry is has nine medical colleges.[11] All TB patients diagnosed at the medical college hospitals are registered and started on directly observed treatment, short-course (DOTS) or directly referred to PHIs. All TB patients referred from the medical colleges of the study area from July 2013 to December 2013 were included in the study. A list of all the TB cases referred (n = 1259) from the medical colleges of Puducherry, India was collected and their referral feedback outcomes were assessed. Other patient particular data including referral date, age and sex of patient, type of disease, and date of treatment initiation were collected from the referral forms.

After reviewing the data stored in the Excel spreadsheet, feedback was considered as received if the referred patients were approached by the TB health visitor/treatment supervisor and any information regarding the follow-up of referred patients such as the allocation of TB number and/or starting of treatment and others was available from PHIs. A successful linkage to PHIs for a given patient was considered if it was assured that the referred patient was started on treatment. Primary access rate (PAR), the proportion of all TB cases who were diagnosed and referred from the medical colleges and were subsequently confirmed to have started treatment at the referred health facility, was used as a measure of successful linkage.

Ethics approval

The study was approved by the RNTCP State Task Force, Puducherry, India. Individual patient consent was deemed unnecessary as the study was for evaluation of the implementation of national program and data from the record were used. No personal identifier was recorded in the electronic databases.

Referral mechanism for tuberculosis patients diagnosed at medical colleges of Puducherry

The patients diagnosed with TB at medical colleges are formally referred (by filling a referral for treatment form) to a PHI closest to their residence for continuation of anti-TB treatment. After verification of address at the receiving unit, appropriate treatment is started. The medical college hospitals fill the TB referral forms in duplicate; the hospital keeps one of the copies and gives another copy to the referring patient. All referrals and feedbacks are documented on a "referral for treatment" register maintained at medical college hospitals. The hospital also sends a list of all the referred patients including details in the referral form to the district TB center (DTC) of their respective district. This list is further sent to the DTC of the receiving unit by e-mail. At the receiving unit, an electronic database in an Excel spreadsheet is maintained. DTCs through a senior treatment supervisor (STS) are expected to follow the status of the referred patients by their visits to the PHC units and at monthly intradistrict meetings held at the DTC office.

Data collection and analysis

Data from the referral registers and feedback forms were used to gather information related to this study. These data were entered into a prestructured format in Microsoft Excel.

The data were analyzed using Statistical Package for the Social Sciences (SPSS) software version 17 (SPSS Inc.). For categorical and continuous variables, proportions and means were calculated respectively. Chi-square test was appropriately applied to find the determinants of feedback and successful referral. *P* value <0.05 was considered as significant.

RESULTS

As per the feedback for referrals shown in Table 1, a total of 1259 patients were referred. Among them, majority were male (74.3%). The mean age of referred patients was 43.3 years ± 16.3 years (range 1-90 years). Most (40.9%) of the patients were in the age-group of 40-59 years. Children (<15 years) and elderly comprise 2.5% and 18.7% of referred patients respectively. Apart from the majority (72.3%) of new cases, 13% were previously treated patients. Approximately one-third (32.8%) of TB patients were extra-pulmonary cases.

Among 1259 referred patients, feedback was received for 680 (54%) patients and only 532 (42.3%) were successfully linked at the PHIs. Further, the date of starting of treatment was mentioned for 506 (40.2%) referred patients and for 26 (2.1%) patients, feedback received was "treatment started"

Table 1: Association of feedback with various TB patient characteristics, referring institutes, and time of referral

Variables	Referred cases *n*	Feedback received *n* (%)	*P* value
Sex			
Male	935	487 (52.1)	0.020
Female	324	193 (59.6)	
Age groups (years)*			
0-9	16	9 (56.3)	
10-19	78	45 (57.7)	
20-29	180	107 (59.4)	
30-39	227	138 (60.8)	0.013
40-49	278	146 (52.5)	
50-59	237	131 (55.3)	
≥60	233	103 (44.2)	
Type of treatment			
Cat 1	910	533 (58.6)	
Cat 2	159	77 (48.4)	<0.001
Not mentioned	190	70 (36.8)	
Disease/patient type†			
New	1086	672 (61.9)	
Previously treated	164	8 (4.9)	0.000
Disease‖			
Smear +ve	740	372 (50.3)	
Smear -ve	101	60 (59.4)	0.007
Extrapulmonary	413	245 (59.3)	
Referral institute			
Government	775	413 (53.2)	0.314
Private	475	267 (55.3)	
Areas referred to			
Puducherry	298	197 (66.1)	0.000
Outside Puducherry	952	483 (50.3)	
Referral period (year 2013)			
July-September	544	280 (51.5)	0.068
October-December	706	400 (56.7)	
Total	1259	680 (54%)	

*10 cases were excluded; †9 cases were excluded; ‖5 cases were excluded

without any mention of the date of starting treatment. For remaining 148 (11.3%) patients, following feedback were obtained; 7 (0.6%) referred patients died before initiation of treatment, 47 (3.7%) migrated, 30 (2.4%) had given wrong address, 13 (1.0%) obtained treatment from private practitioners, 8 (0.6%) were non-traceable, 40 (3.2%) were given only TB number and no information regarding the starting of treatment was given. One patient refused treatment, one referred to inappropriate PHI and one patient was further referred to higher centre from PHI [Figure 1].

As compared to male TB patients, feedback was received for more females. Also, compared to elderly, better feedback was obtained for adults and children and this difference was statistically significant ($P < 0.05$). The feedback was significantly lower among category II patients, previously treated patients and among patients who were referred during 4th quarter ($P < 0.05$). There was a statistically significant difference in the feedback received with respect to the gender, age groups of patients, type of treatment received, disease type and areas referred to Puducherry or outside ($P < 0.05$).

For 476 (37.8%) patients, the date of referral and date of starting treatment was clearly mentioned. Among them, only 302 (63.4%) were started on treatment within one week; 103 (21.6%) and 71 (14.9%) were started on treatment during second week and beyond two weeks of referral respectively. The mean interval between referral and starting the treatment was 7.4 days ± 8.5 days (Range 0-69 days).

DISCUSSION

To achieve and maintain the objective of treatment success rate of >85%, the confirmation of all referral patients to be started on treatment is important. Few studies have assessed the successful linkage for continuing anti-TB treatment after referral from medical colleges in India, where a large proportion of all TB patients are diagnosed and referred.[12] In the present study, only 13 (0.9%) patients were started on treatment at the DOTS center of the medical colleges and majority (87.6%) of the TB patients diagnosed were referred to start and continue treatment at the PHIs. Among those thirteen patients, who were started on treatment at the DOTS centre of medical colleges, seven patients were offered non-DOTS or non-RNTCP drug regimens. The reasons for this non-compliance with national RNTCP treatment guidelines have not been specified.

In the present study, formal feedbacks from peripheral facilities were received for 54% of the referred patients only. The study carried by Kondapaka *et al*.[12] in Hyderabad, India shows (74%) successful feedback whereas a study by Al-Hammady *et al*.[13] in Yemen revealed (88.8%) successful feedback which is higher than the feedbacks received in the present study. The lower feedback in the present study could be due to the fact that a large number of TB patients

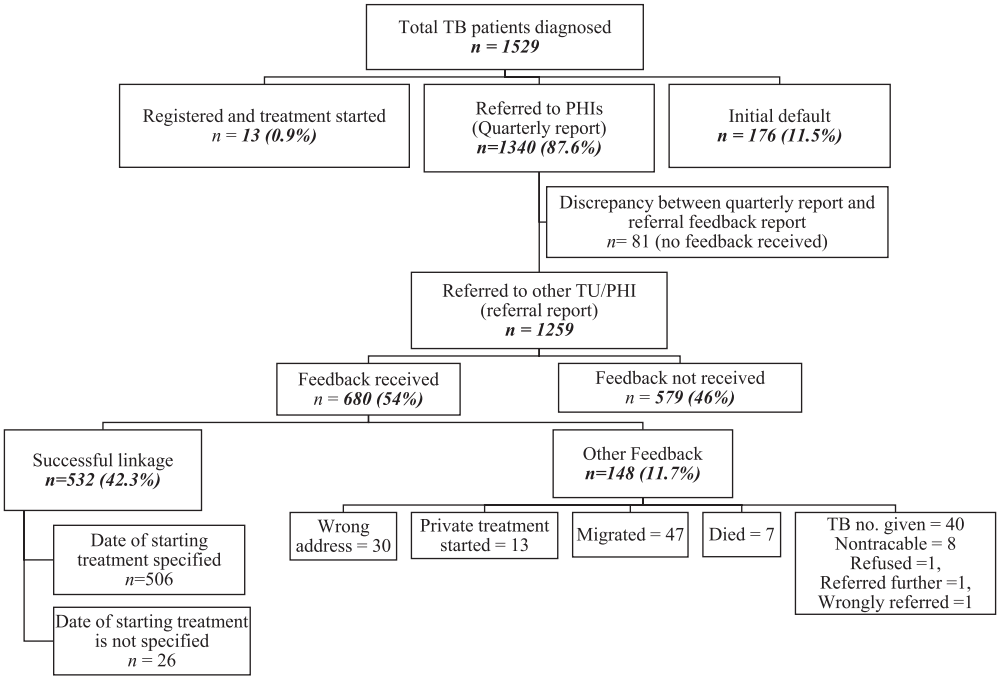

Figure 1: Flow diagram of TB patients diagnosed at the medical colleges of Puducherry from July 2013 to December 2013

diagnosed at the medical colleges of Puducherry are referred to other states having different administrative jurisdiction. Also, the feedback from PHIs situated in other states was particularly lower in the present study.

The present study found that nearly half of the referred TB patients (46%) were without any feedback and were likely to be lost by RNTCP. Further, those patients who were registered at PHIs, were delayed started on treatment. Many of these patients without any feedback are actually lost by the TB control programme, indicating deficiencies in referral for treatment and feedback mechanism and such patients may become defaulters or MDR cases. This further highlights the need for better links and discussions with PHIs as well as ensuring active feedback mechanism. Direct communication by mobile phones between referring facility and the facility to which the patients are referred, can be considered as a way to improve this linkage.[14] Also, for improving the feedback, there is need to improve the coordination with other border districts and the role of RNTCP State and Zonal Task Forces could be of vital importance in this regard.

In the present study, 532 (42.3%) referred TB patients were started on treatment. Further, as per the RNTCP guidelines, treatment should be started within one week of diagnosis; but among those who were started on treatment at PHIs, only 337 (63.4%) were started on treatment within one week of referral. Overall, the average duration between referral and starting the treatment was 7.4 days which is higher than other study.[14]

There is need to strengthen the feedback mechanism in RNTCP and to investigate the reasons for initial default. Keeping the high initial default rate and poor feedback, it is suggested that patients who do not collect their sputum smear results be traced and that RNTCP staff fill in and neatly file referral sheets whenever a referral is made. Many patients who had given wrong address and/or were referred to inappropriate PHI were usually lost and there is no mechanism to reach these patients. A directory having addresses of all the PHIs, where patients were usually referred can be helpful for the referring physician. As per the referral guidelines of RNTCP, referral form should be filled in triplet; which should be followed strictly. This study included a large number of TB patients and information was gathered on an individual basis including some of the patient characteristics. Also, as we used routine programme data, the findings are likely to reflect the operational reality on the ground and further appropriate steps can be taken to improve the feedback mechanism. The findings of this study can be generalized to referral and feedback of TB patients, particularly to those medical colleges where a large proportion of TB patients are reporting from nearby districts. We followed the STROBE guidelines for reporting observational studies.[15]

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Conflicts of interest

There are no conflicts of interest.

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