

“Is there a difference in treatment outcome of tuberculosis patients: Rural Healthcare Providers versus Community Health Workers?”

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ABSTRACT

Introduction: Rural healthcare providers (RHCPs) are the first point of contact for majority of patients in rural parts of India. A total of 75 RHCPs were trained and engaged in Hazaribagh to identify presumptive tuberculosis (TB) patients (PrTBPs) and refer them for diagnosis. Patients diagnosed with TB were initiated on directly observed treatment short course (DOTS) under the programme. Based on patients' choice, the treatment providers were either RHCPs or community health workers (CHWs). In this paper, we aim to compare the treatment outcomes of TB patients who received DOTS from RHCPs with CHWs. **Method:** This is a retrospective cohort study using secondary data routinely collected through project and Revised National TB Control Programme. **Results:** Over the period of 24 months, 57 RHCPs continued to be engaged with project and a total of 382 referrals were made out of which 72 (19%) were diagnosed with TB. Based on choice made, 40 (55%) of TB patients chose RHCPs and 32 (45%) CHWs as their treatment provider. The mean successful treatment completion rate was 87% in the RHCP group compared with 81% for CHWs (P value 0.464). The percentages of unsuccessful outcomes were similar for both groups. **Conclusions:** Our study demonstrates the process to engage RHCPs in TB prevention and care. The study highlights community preference for RHCPs as DOT provider who can produce similar TB treatment success rates as that of CHWs identified by programme.

Keywords: Community-based screening, community health workers, DOTS, Rural healthcare providers, tuberculosis

Introduction

India is one among high tuberculosis (TB) burden countries globally where an estimated million cases are missed from routine reporting system. One of the reasons for missing TB cases could be low participation of private sector in

Revised National TB Control Programme (RNTCP). The private sector in India is a mix of qualified and unqualified practitioners who largely operate on fee-for-service basis.^[1,2] RNTCP has designed various modalities to engage qualified private healthcare providers with a mission to End-TB by 2025.^[3] However, there are no strategies to engage unqualified private practitioners who are known as “rural healthcare providers (RHCPs),” “rural medical practitioners (RMPs),” “less than fully qualified practitioners (LTFQs),” “quacks,” or “informal healthcare providers” who share a substantial proportion of the sectors client load.

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An estimated 2.5 million RHCPs in India provide a wide range of primary care services that includes treatment for malaria, TB, diarrhoea, non-communicable diseases services, etc.^[1-2] Evidences suggest that people living in lower socioeconomic strata especially in rural and tribal areas access RHCPs for their primary healthcare services that includes cough, which is primary symptom for TB.^[4] Given their limited knowledge about TB, identification of presumptive TB patients (PrTBPs) may jeopardize TB prevention and care efforts.^[5-7] Few programme had engaged RHCPs to increase the coverage of healthcare services in India and globally.^[8-10] However, there is limited literature available about the success of these models, even for TB programme.

An innovative pilot project was designed under Project Axshya (The Global Fund supported TB grant to India) to identify, sensitize, and train RHCPs on TB prevention and care and facilitate their engagement with RNTCP) using available “mHealth” application on TB.^[10] The study was designed to ensure community-based screening of PrTBP among the clients who visit RHCPs for any ailment and refer identified PrTBPs to nearest designated microscopy centre (DMC, Diagnostic facility of Public Health System) for diagnosis of TB. The PrTBPs referred through RHCPs diagnosed as having TB are initiated on treatment with free drugs made available from the public health system—under the treatment guideline of directly observed treatment short course (DOTS). As part of the programme, TB patient/s made a choice to take DOTS either from RHCPs who made the referral or from community health workers (CHWs) known as Sahiya’s in Jharkhand. The aim of this study is to compare the treatment outcome of TB patients who provided treatment through RHCPs with that of CHWs.

Methods

Study design

This is a retrospective cohort study using secondary data routinely collected by RNTCP and project Axshya.

Study setting

The project was implemented in Hazaribagh, Jharkhand, one of the remote, semi-tribal districts of East India. Majority of the population is dependent on agriculture for livelihood. Under the project Axshya, 210 RHCPs were line listed through a mapping exercise. On an average, RHCPs had a catchment area of about 5,000 population covering around 10 villages. Thus, were accessible, available, and affordable to population.

Over a period of 6 months, all the willing RHCPs [~110 line listed] were sensitized on TB prevention and care during “one-to-one” interaction. Interested RHCPs were provided 2 days training by district level project staff (District Coordinator – DC), on the referral process, sputum collection and transportation (SCT) mechanism and follow-up for treatment completion.^[11] The pilot project was implemented over a period of 2 years, that is, from January 2015 to December 2016, wherein a total of

75 RHCPs were trained in three batches during 2014–15. The RHCPs engaged in the project had a formal agreement to screen and identify PrTBPs among visiting clients and refer to nearest designated microscopy center (DMC) of public health system for diagnosis. In addition, training was provided on TB infection transmission, prevention and care, treatment modalities of DOTS, and programme recording and reporting formats.

The DC and a project staff made regular visits to RHCPs and encouraged them to conduct verbal screening of patients attending their OPDs for TB on these four symptoms: cough >2 weeks, weight loss, fever, and night sweats (as per programme). For each successful referral reaching DMC, an incentive of Rs 30 was paid to RHCP. The programme staff shared results of sputum examination in requisite format with PrTBPs through RHCPs. All sputum-smear positive patients were initiated on treatment as per RNTCP guidelines. The sputum-smear negative PrTBPs were referred to district hospital for further evaluation and management.

The diagnosed TB patients were initiated on treatment by medical officer at DMC, who would take consent from the patient for his/her choice of DOT provider. DOT provider was selected by TB patients between the referring RHCP and CHWs identified by programme. CHWs are identified by programme who provide various healthcare related services in the community under the National Health Mission, known as Sahiya’s in Jharkhand, Mitanins in Chhattisgarh, and ASHAs in other parts of India. Following initiation of treatment, DC would make initial first visit to TB patients irrespective of DOT provider.

Study population

All the pulmonary TB patients were identified by RHCPs and eventually diagnosed with TB during January 2015 to December 2016 were included in the study.

Data variables and source of data

The list of all patients diagnosed by the RHCPs during the study reference period was extracted from project database. The treatment records were updated during March 2018 from the treatment outcome registers of National TB Programme. The details of age, gender, site of TB, type of TB, DOT providers were matched with project data and TB register.

Data entry and analysis

Data was entered in Microsoft Excel and analyzed using Stata version 11.0. The age, gender, site of TB, type of TB, and DOT provider were summarized using frequency and percentage. The baseline demographic and clinical characteristics were compared across those received DOT from RHCPs and CHWs using Chi-square test.

The programmatic TB treatment outcomes were summarized using frequency and percentage across those received DOT from RHCPs and CHWs. The proportion of successful treatment

outcomes (cured and treatment completed) and unsuccessful outcomes (died, loss to follow-up, failure and switched to category-IV) were compared across study groups using Chi-square test [The outcome definitions are as per RNTCP].^{12]}

The study used routine project data which was matched with programme data. Secondly, programme staff were involved in reporting the outcome of the TB patients. The data used do not have patient identifiers or individuals who received services. We therefore did not seek ethical approval for the study.

Results

Out of the total 75 RHCPs trained, 57 RHCPs (76%) were engaged with the programme during the study reference period. It meant that they had referred at-least one PrTBP to DMC and were DOT provider to at least one TB patient. During the reference period, 382 PrTBPs were referred by RHCPs and 280 (73%) of them had sputum-smear microscopy examination at the DMC of these 72 (25%) were diagnosed with TB [Figure 1].

All the 72 TB patients were initiated on TB treatment as per programme guidelines. Of those, 40 (55%) selected the referring RHCP as their DOT provider and the rest 32 (45%) received TB treatment from CHWs. There was no difference in distribution of age ($P = 0.021$), gender ($P = 0.638$), site of TB ($P = 0.567$), and type of TB ($P = 0.703$) between those received DOT from RHCPs and CHWs [Table 1].

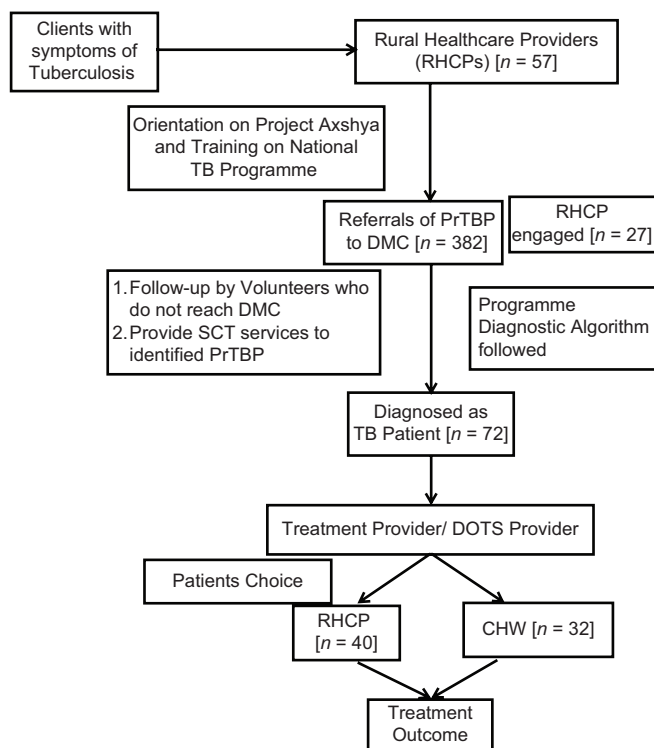


Figure 1: Schematic outline of intervention to engage RHCPs in National TB programme

Of the 40 who received DOT from RHCP, 35 (87.5%) had successful treatment outcome wherein it was 26 (81%) out of 32 patients among those who received from CHWs. However, there was no statistically significant difference ($P = 0.464$) in the proportion with successful treatment outcomes between study groups. Similarly, there was no difference in proportion cured, treatment completed, died, loss to follow-up, failure and switch to Cat-IV [Table 2].

Discussion

This is probably the first study to assess preference to receive DOT from RHCPs and the treatment outcomes of TB patients supported by RHCPs or/and informal providers who were engaged in a project mode for TB prevention and care. Firstly, about one in two of the TB patients identified and eventually diagnosed by RHCPs preferred to receive DOT from RHCP. Secondly, there was no difference in TB treatment outcomes of TB patients who received DOT from RHCP and CHWs. The results highlight preference for RHCPs as DOT provider and also assures that RHCPs can produce similar TB treatment success rates as that of CHWs identified by programme.

In this project, nearly 26% of the PrTBPs identified by RHCPs could not be subjected to sputum examination and 5% of the TB

Table 1: Comparison of socio-demographic and clinical characteristics of TB patients availing DOTs from either RHCP or CHWs in Hazaribagh district of Jharkhand

Characteristics	RHCP n (%) [*]	Community Health worker, n (%) [*]	P [†]
Total	40 (55)	32 (45)	
Age (Mean, SD) [#]	40.9 (13.6)	36.7 (14.9)	0.221
Gender [†]			
Male	28 (70.0)	24 (75.0)	0.638
Female	12 (30.0)	8 (25.0)	
Site of TB			
Pulmonary TB	36 (90.0)	30 (93.7)	0.567
Extra Pulmonary TB	4 (10.0)	2 (6.3)	
Category of TB Treatment			
Newly Diagnosed	35 (87.5)	27 (84.4)	0.703
Previously treated	5 (12.5)	5 (15.6)	

^{*}Column Percentage [†] Chi-square test - CHWs

Table 2: Comparison of programmatic treatment outcomes of TB patients availing DOTs from either RHCP or CHWs in Hazaribagh district of Jharkhand

TB treatment Outcome	RHCP, n=40, n (%) [*]	Community Health worker n=32, n (%) [*]	P [#]
Successful	35 (87.5)	26 (81.3)	0.464
Cured	26 (65.0)	17 (53.2)	
Treatment Completed	9 (22.5)	9 (28.1)	
Unsuccessful	5 (12.5)	6 (18.7)	0.464
Failure	0 (0.0)	1 (3.1)	
Lost to follow up	5 (12.5)	2 (6.3)	
Died	0 (0.0)	2 (6.3)	
Shift to Cat IV	0 (0.0)	1 (3.1)	

^{*} Percentage calculated with total number of individuals in each group as denominator. [#] Chi-square test

cases diagnosed could not be initiated on treatment. Dropping out of care cascade of TB programmes by a proportion of PrTBPs and patients is not uncommon. The target population of the project being migrant in nature, few of them failed to comply with its diagnosis and treatment protocols despite persuasion by DOT providers. In the absence of this scenario, project could have shown a greater impact with the same effort. Some of the “initial lost to follow-up”—those who failed to initiate treatment after diagnosis—may have ended up receiving RNTCP treatment from their original places of residence, but the project had no means to reconcile that information. However, the proportion of initial lost-to-follow-up encountered in the project was less than what has been the overall experience of RNTCP in these areas.^[13]

RHCPs in our study group were from the community with reach to remotest villages and access to the community for over 10 years. The project made progress as it included programme officers to sensitize and train RHCPs on TB prevention and care, including modalities of programme (do’s and don’ts). Secondly, laboratory technician at referral DMCs prioritized the referrals from RHCPs for sputum examination. Thirdly, diagnosed TB patients among RHCP referrals had an option to select between RHCP or CHWs as their DOT provider. This had motivated RHCPs to identify and refer PrTBPs and be part of the TB programme as a change agent.

TB is also known as disease of poor, and evidence show people access locally available healthcare provider, usually RHCPs who act a primary care physician.^[14] One of the Project—Project Axshya—as well as the literature shows, by engaging RHCPs and by providing them with training can bring about positive changes in their practice.^[15] TB programme of India, in its National Strategic Plan needs to consider engaging RHCPs as key stakeholders to provide primary care in rural and remote areas.^[16]

This project facilitated dissemination of TB-related messages and increased community-based screening for PrTBPs through RHCPs. We believe this mechanism has created a “social capital” which could harness if RHCPs are engaged systematically. RHCPs usually did verbal screening followed by referrals and continued efforts of DC ensured documentation of all referrals made. Nearly 80% of those PrTBPs with complete information about the referrals were considered for analysis. Though the referrals reaching the DMC were less in number, the positivity rate is considered to be high. Secondly, the documentation of treatment interrupters or missed doses was difficult to measure, though both RHCP and CHWs used the same recording and reporting formats as per national programme (DOTS – Patient Treatment card). Thirdly, loss to follow-up cases reveals that out-migration from the district for manual labor work is quite substantial.

Conclusion

Our study demonstrates the process to engage RHCPs to facilitate screening for PrTBPs and to be a community DOT provider equivalent to that of any CHWs identified by

programme, thereby creating a “social capital.” The study also highlights community preference for RHCPs as DOT provider who can produce similar TB treatment success rates. The lessons learnt highlight that programme needs to utilize the network and reach of RHCPs through sensitization session about TB prevention and care as a strategy to achieve target of End-TB.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient (s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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