

## ORIGINAL ARTICLE

## Knowledge and practice regarding pulmonary tuberculosis among private practitioners

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### Article Cycle

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### Abstract

**Background:** India leads the world in its burden of tuberculosis (TB). General practitioners are the backbone of health care system. **Objective:** To assess the knowledge and practice of the allopathic private practitioners regarding TB. **Method:** In June 2012– October 2012, a cross-sectional study was conducted in West Bengal, India among 180 private practitioners who treat TB patients; using a self-administered semi-structured questionnaire. **Results:** About 58.3 % and 56.7 % study population knew full form of RNTCP (Revised National Tuberculosis Control Program) and DOTS (Directly Observed Treatment Short Course) respectively. The correct modes of transmission were expressed by 75.0 % of them. The most common symptom of TB was rightly answered by 46.7 %. About 43.3 % and 33.3 % replied correctly about number of sputum samples collected and timing of collection. More than half participants knew number of categories and 8.3 % knew categorisation correctly. About 66.7 % could correctly state the names of recommended 1st line anti-TB drugs; frequency of drug administration told correctly by 68.3 %. Very few Private Practitioners (PPs) knew treatment regimens correctly for each category. Almost all participants knew that treatment under DOTS was given supervised. About 78.3 % PPs expressed correctly that treatment for TB was given in two phases; the duration of treatment of 6-8 months was stated by 53.3 %. **Conclusion:** Many gaps were found in the knowledge and practices of PPs regarding Tuberculosis. PPs should be properly trained and sensitized to use RNTCP guidelines.

### Key Words

Knowledge; Practice; Private practitioners; Tuberculosis.

### Introduction

Tuberculosis is a major public health problem in India, the highest TB burden country in the world, accounting for one-fifth (21%) of the global incidence of TB and a higher share of global incidence of multi-drug resistant (MDR) TB. (1)

The Millennium Development Goal (MDG) Development target to halt and reverse the TB Epidemic by 2015 has already been achieved. (2)

The National Tuberculosis Programme (NTP) launched in 1962 failed because of inadequate program funding, managerial weaknesses, irregular drug supply, multiplicity of treatment

regimens, low rates of case detection and treatment completion (30%), high rates of default (40–60%) and continuing high mortality (50 per 100,000). (2) The Revised National TB Control Program (RNTCP), based on the internationally recommended Directly Observed Treatment Short-course (DOTS) strategy, was launched in 1997; expanded across the country in a phased manner.

Since 2007 the program is achieving a treatment success rate of > 85% and has consistently maintained the new sputum positive (NSP) case detection rate (CDR) of > 70% which are the objectives of RNTCP. In 2010, RNTCP has achieved the NSP-CDR of 71% and treatment success rate of 87% which is in line with the global targets for TB control. (3) Since the pilot implementation of RNTCP in 1993, knowledge of TB and the use of DOTS have improved, especially in the public sector. (4)

As Private practitioners are dealing with the major bulk of the patients they are the backbone of health care system. Almost half of patients with tuberculosis in India initially seek help from the private healthcare sectors, where diagnosis, treatment and reporting practices often do not meet national or international standards for tuberculosis. (5, 6, 7)

As RNTCP enters its new phase (2012 – 2017), there is an urgent need to engage, incentivize and integrate the private sector into national TB control to facilitate universal access and to curb mismanagement of TB which threatens India's TB control efforts. (8) In 2002 a new program was started in order to train more private sector physicians in the RNTCP and DOTS, which was known as the public-private mix for DOTS or PPM-DOTS.4 Public-private mix has been defined by WHO as strategies that link all healthcare entities within the private and public sectors to national

tuberculosis programmes for expansion of DOT activities. (9)

### Aims & Objectives

With this background, a study was undertaken in North 24 Parganas and Paschim Midnapore district of West Bengal with the objectives to assess the knowledge and practices of the allopathic private practitioners regarding Tuberculosis.

### Methods

An observational, descriptive, field based, cross sectional, epidemiological study was carried out from June 2012 to October 2012 among the registered allopathic practitioners providing their services in North 24 Parganas and Paschim Medinipur District of West Bengal; who treat TB patients in their clinics. Study tool was an English language, pre designed, pre tested, self-administered, semi-structured questionnaire containing both open ended and close ended questions. Study variables were age, sex, educational qualification, type of practice, duration of practice, area of practice, training of TB received, different aspects of TB knowledge (heard of RNTCP and DOTS, cause and mode of transmission, commonest symptom, definition of TB suspect, diagnosis, categorization, treatment, MDR TB) and different aspects of TB practices. All the hundred and eighty registered allopathic private practitioners who treat TB cases in North 24 Parganas and Paschim Midnapore districts were recruited through census sampling. Before actual study, a questionnaire was designed in consultation with 3 experts on the subject of data collection and pre-testing of the same was done to assure its validity. Necessary correction and modification was adopted in the questionnaire for smooth operation in data collection.

A prior contact was made with the study population in their suitable time to get written consent and administration of the questionnaire. After reaching the practitioners, they were informed about the purpose of the study and their informed written consent was taken. They were assured about their confidentiality and anonymity. Then, data were collected from them by administering the questionnaire.

The overall knowledge concerning TB was assessed based on the private practitioners' response to twenty two (22) TB related questions. Correct answers were given a value of one (1) and incorrect answers were given a value of zero (0). Knowledge was categorized as satisfactory or unsatisfactory based on the cumulative result and the related mean value of responses. Scores above the mean value were categorized as satisfactory and given a value of one (1) while scores below the mean value were considered to unsatisfactory and given a value of zero (0). The scores were then cross-tabulated with the independent variables to look for possible associations.

Statistical analysis: Data were entered in MS-EXCEL, compiled and analyzed by Epi Info 6 version and SPSS 17 version by proper statistical tests (Percentage, Chi-square, Odds Ratio). P-value of < 0.05 was considered statistically significant.

Ethical clearance: This proposed study was reviewed by the Institutional ethical committee and clearance was obtained.

## Result

There was cent percent response rate. The distribution of medical practitioners according to their general profiles was found as described. All private practitioners were allopathic doctors and they served TB patients in their clinics. The age of the study

participants ranged from 26 to 57 years; majority (60.0%) were less than 40 years with a mean age of  $39.3 \pm SD 8.2$  and median was 37.5. Maximum (86.7%) were males, and graduate (71.7%). General practitioners constituted most (73.3%) of the doctors and majority of them (68.3%) had been practicing for less than 10 years. Average years of duration of practice were  $8.73 \pm 6.73$  and median was 5.5. Almost all (95.0%) practitioners examined at least five new cases of TB per month and the median number of TB patients seen per month by a practitioner was eight. Based on the area of practice, less than half (40.0%) medical practitioners belonged to urban and about 61.7% had received RNTCP training.

Private practitioner's knowledge was assessed and this was given in [Table 1](#). Maximum, i.e; (85.0%) private practitioners (PPs) had heard of RNTCP but only 58.3 percent private practitioners knew full form of the same. Correct response regarding the full form of DOTS was given by more than half (56.7%) of the practitioners.

While all (100.0%) PPs acknowledged tubercle bacilli to be the causative agent of tuberculosis; correct modes of transmission were expressed by three-fourth (75.0%) of private practitioners.

Persistent cough for 2 weeks or more as symptom and definition of TB suspect under RNTCP were rightly answered by only half (56.7% and 52.7% respectively) of the practitioners.

About two-third (66.6%) of PPs opted for sputum smear examination as the investigation of choice to diagnose pulmonary TB. However in response to the question regarding number of sputum samples collected and timing of sputum collection; only two fifth (43.3%) and one third (33.3%) participants

replied in correct way. Moreover almost one third (31.6%) PPs had correct knowledge about action to be taken if all sputum samples for diagnosis are negative.

Regarding categorisation of patients, half (55.0%) of the PPs knew number of categories of tuberculosis correctly. Maximum PPs didn't know how to categorize TB patients and only very few (8.3%) PPs knew categorization correctly for each category.

Only two-thirds of the physicians (66.7%) could correctly state the name of the recommended 1st line anti-TB drugs. A very few (6.7%) PPs knew treatment regimens correctly for each category.

While more than three fourth (78.3%) PPs expressed correctly that treatment for TB is given in two phases; frequency of anti-TB drug administration was known by more than two third (68.3%) PPs and the correct total duration of treatment of 6-8 months was stated by half of the participants (53.3%). Almost all (96.7%) study population knew that treatment of TB under DOTS was given supervised.

In response to the question 'whether DOTS was applicable for children', majority (80.0%) of the practitioners correctly replied. Two third (68.3%) of them knew that isoniazid prophylaxis to household contacts should be given to the children less than 6 years old. One fourth (28.3%) of doctors correctly identified that TB bacilli resistant to Isoniazid and Rifampicin with or without resistant to other anti TB drugs should be considered as MDR tuberculosis. More than half (56.7 and 51.7% respectively) of the practitioners responded correctly to the questions put forward to them in respect of 'which anti-TB drugs were contra-indicated during pregnancy' and 'which drug should be stopped in case of jaundice.'

Detailed analysis of questions related to the Practice adopted in the management of TB

patients was shown in [Table 2](#). It was noted that in a suspected case of tuberculosis, sputum examination was advised by only half (51.6%) of the private practitioners as primary tool of diagnosis. More than half (58.3%) of our study populations used to send their suspected TB patients to Govt. Laboratory for investigations. Out of 180 PPs treating TB, two-third (66.6%) were giving anti-TB medications in two phases, intensive (IP) and continuation (CP). Half (53.3%) of the participants followed the correct duration of treatment as per RNTCP guideline. For treating tuberculosis, PPs were using different regimens and only one fifth (21.7%) PPs were using the regimen recommended by the RNTCP. Out of 180 participants, two fifth (41.6%) were prescribing treatment frequency recommended by RNTCP (alternate day). Anti-TB treatment under direct observation was provided by just a few (13.3%) of the study population. Sputum microscopy for follow up during anti-TB treatment was advised by two fifth (40.0%).

Among medical practitioners who advised sputum microscopy as a tool for treatment monitoring, the correct frequency of treatment monitoring was done by just one fourth (25.0%) of the respondents.

More than one-third (38.3%) of the study participants had materials to spread awareness about TB in the community. Regarding treatment of TB-HIV co-infection, one third (36.3%) treated them. Only a very few (10.4%) private practitioners expressed their willingness to get involved in RNTCP for TB control.

Overall knowledge of the study population was assessed based on their responses provided to the questionnaire. It was seen that majority of the respondents (62.8%) had satisfactory knowledge concerning TB while 37.2 percent didn't had acceptable knowledge.

This was revealed ([Table 3](#)) that those who attended TB training, specialist practitioners, had post graduate qualification and more years of experience were more likely to have satisfactory knowledge compared to those who did not receive training, general practitioners, graduate and less experienced.

## Discussion

This study identified several knowledge & practice gaps about diagnosis and management of pulmonary tuberculosis among private practitioners. An adequate and appropriate anti-TB drug prescription is of crucial importance in order to “cure” a TB patient of his/her disease. Irregular, incomplete and inadequate treatment along with improper drug regimens was the most common cause of drug resistance. (10, 11)

Of the 180 doctors surveyed, about 61.7 % had received modular training on RNTCP; similar to one study among physicians by Vandan et al at Lucknow (60.0%) (12) but dissimilar to studies by Dutta et al at Hooghly (22.0%) (13) and Majumdar et al at Surat (11.0%). (14)

Majority (85.0%) of the private practitioners (PPs) in this study had heard of RNTCP but only 58.3 % of them knew full form of the same. According to a study by Khadse et al at Nagpur (15) it was 68.9 % and 35.9 % respectively.

Correct response regarding the full form of RNTCP and DOTS was given by 63.9 % and 27.0 % respectively by Dasgupta et al. (16)

In our study, 56.7 % knew the full form of DOTS which was quite higher than study by Deveci et al (17) where full form of DOTS was known by only 16.7 % practitioners.

All doctors of the present study correctly identified the causative agent of TB, similar to a study by Jayaprakash in Davangere city where 97.0 % knew it (18)

Their knowledge regarding the transmission of TB was adequate (75.0%). Earlier studies by Majumdar et al (100%), (14) Jayaprakash (81.2%) (18) and Shehzadi et al (87.5%) (19)

revealed similar results. However, much lower rate was observed by Deveci et al (21.2%)<sup>17</sup> and Rajpal et al (4.2%). (20)

The index of suspicion of TB was moderately high amongst physicians. About 56.7 % could correctly identify the commonest symptom of TB and 52.7 % PPs were aware of the fact about who was a TB suspect on the basis of pulmonary symptoms; more or less similar finding was observed at Lucknow,<sup>(21)</sup> Gwalior,<sup>(22)</sup> Central India,<sup>(23)</sup> Pakistan (24) and Ethiopia . (25) However, study at Davangere,<sup>(18)</sup> Varodara ,<sup>(26)</sup> Jamnagar (27) and a KAP study across different States revealed higher result (28) whereas Kolkata study (16) revealed lower result.

Recommended standard for diagnosis of pulmonary TB is by sputum microscopy. In this study, almost two-third study population considered sputum microscopy as the best test for confirmation of pulmonary TB and this was corroborative with the findings of many previous studies. (15,19,22,28,29)

It was noted in the present study that 43.3 % participants knew correctly the number of sputum samples required. Corresponding figures were in Lucknow 54.0%,<sup>(12)</sup> Hooghly 26.0 %, (13) Nagpur 26.1% (15) Kolkata 43.8 %, <sup>(16)</sup> Davangere 58.0 %; (18) Varodara 30.7 %, <sup>(26)</sup> Jamnagar 21.4% (27) and North India 57.0% (30)

About 55.0% of our study population had knowledge regarding the number of categories as per RNTCP programme but only 8.3% of them knew types of patients in each category. This was in line with the findings of some previous studies.<sup>(15,16,22,30)</sup>

About 53.3% physicians stated that under RNTCP guidelines, the therapy for TB should last for 6 and 8 months respectively for Cat I & Cat II. This was quite below than the findings observed by earlier studies (12,18,22,23), but in line with Deveci et al (17) and much above the study by Rizvi et al.<sup>(24)</sup>

More than two third physicians accurately identified the recommended intermittent mode of TB treatment as proposed by the RNTCP; which was not in line with the findings of previous studies at Hoogly,(13) Kolkata,(16) Davangere,(18), Delhi,(20) and Lucknow,(21) but similar to study by Singla et al (52.5%). (29) Again two third participants (66.7%) could name all the primary anti-tuberculosis drugs which was consistent with the finding of earlier studies. (12,16,17,20).

It was observed that the awareness regarding MDR-TB were low among the participants. Only 28.3% doctors correctly identified the definition of MDR-TB; which was much less than Lucknow study (21) but corroborative with the result of Gwalior. (22)

About 68.3 % of private practitioners were aware of the fact that INH prophylaxis should be given to under 6 children in contact with active tuberculosis as per RNTCP guidelines; which was in accordance with findings of some studies. (13, 22, 23) In a study by Singla et al (29) only one practitioner knew this special care.

Regarding the management of a female who becomes pregnant while receiving anti-TB therapy, 56.7% suggested that it would be appropriate to continue the same treatment avoiding streptomycin; similar to the finding at Pakistan and Kolkata. (16,24)

51.7% of PPs knew which drugs should be stopped during jaundice; corresponding findings were 46.4 % by Dasgupta et al (16), 27.3% by Deveci et al,(17) and only 2.8% by Rajpal et al.(20)

Common Practices among private practitioners: It was observed that half of the practitioners relied on sputum examination for diagnosis of tuberculosis. Studies carried out by other researchers on private allopathic practitioners both in India and around the globe had also noted the similar importance of sputum examination in the diagnosis of TB patients. (13,15,21,25,30,31)

It was noted that more than half of the private practitioners (58.3%) referred their patients to Govt. labs for investigation, much higher than study by Datta et al. (13) and Srivastava et al. (22) This approach of referring patients to private labs by doctors may be due to either the lack of awareness about the Designated Microscopy Centre in the area or to the monetary gain received from these labs. However in the baseline KAP study by CTD showed that except in Tamilnadu, doctors refer them to government hospitals for sputum test. (28)

It was also noted in the present study and other studies (28,32) that half of the practitioners prescribed anti-TB treatment for 6-8 months.

Supervised, intermittent treatment is a well established strategy in RNTCP. But anti-TB treatment under direct observation was provided by just 13.3% of private practitioners. Studies carried out among the allopathic practitioners (17,27) had also noted similar results. In Delhi study (29) none gave treatment under supervision.

Similarly majority of the private practitioners preferred daily regime (58.4%) over the alternate day regime (41.6%) for the treatment of TB patients in this study and previous studies. (17,27,28,29) In a study at Delhi (29) nobody prescribed intermittent regimen.

Two third (66.6%) practitioners prescribed anti-TB treatment in two phases - IP & CP which was much lower (38.6%) than study at Nagpur.(15)

On question of treatment of HIV-TB patients, it was noted that only 36.7% of the participants wanted to treat such patients and the finding was dissimilar to study by Srivastava et al (22) where none wanted. This could probably due to lack of knowledge about the management of TB-HIV co-infection.

About 40.0% participants used smear microscopy as a tool for treatment monitoring

and this was more than observation of some other studies.(13, 15, 18, 19, 27, 29, 30) Observations on various regimens (eleven) were mentioned in the responses received and of those only 21.7% were scientifically acceptable. A study of Rajpal et al (20) revealed 141 different treatment regimens of which 7.8 % were scientifically acceptable, Baxi et al revealed (7 different anti-TB drug regimens),(26) Yadav et al (27) revealed 11 different regimes of which 4.7 % were recommended by RNTCP, Singla et al (29) revealed 102 regimes of which 29.4% were correct and Uplekar et al (32) revealed 63 different regimes of which 5.6% were correct. These observations suggest need for training of PP's including subsequent training at periodic intervals for RNTCP.

### Conclusion

There were many gaps in the knowledge and practices about tuberculosis among PPs as per guidelines of RNTCP.

### Recommendation

Knowledge of Private Practitioners needs to be upgraded regarding TB and RNTCP by CMEs. Services of Private Practitioners may be utilized by involving them in RNTCP. Public Private Partnership (PPM) may be strengthened under RNTCP II. District Tuberculosis Officers (DTOs) need to maintain regular contact with GPs.

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## Tables

**TABLE 1 DISTRIBUTION OF PRIVATE PRACTITIONERS ACCORDING TO THEIR KNOWLEDGE ABOUT TUBERCULOSIS (N = 180)**

Information sought	Number of correct responses	(%)
Heard about RNTCP - (Revised National Tuberculosis Control Program)	153	85.0
Full form of RNTCP - (Revised National Tuberculosis Control Program)	105	58.3
Full form of DOTS - (Directly observed Treatment ;Short Course)	102	56.7
TB is caused by - (Mycobacterium. Tuberculosis)	180	100.0
TB is transmitted by - (Droplet infection; Droplet nuclei)	135	75.0
Most common symptom of TB - (Persistent cough for 2 weeks or more)	102	56.7
Who is a TB suspect - (Persistent cough of 2 weeks or more)	95	52.7
Primary tool for diagnosis - (Sputum for AFB)	120	66.6
Number of sputum sample collected - (Two)	78	43.3
Correct method of sputum collection - (spot-morning)	60	33.3
Number of treatment categories under RNTCP -(2)	99	55.0
No. of phases of treatment under RNTCP - (2; IP & CP)	141	78.3
Frequency of drug administration in DOTS -(thrice weekly)	123	68.3
Supervised treatment-(yes)	174	96.7
Duration of anti-TB treatment - (cat I-6months;cat II -8months)	96	53.3
First line anti TB drugs - ( H/R/Z/E/S)	120	66.7
Whether DOTS is applicable to children - (yes)	144	80.0
Advice given to under 5 household contacts -(INH prophylaxis)	123	68.3
What is MDR(multi drug resistant) TB - (TB bacilli resistant to INH & RMP with or without resistant to other anti TB drugs)	51	28.3
Anti TB drug contraindicated in pregnancy -(Streptomycin)	102	56.7
Anti TB drugs that should be stopped in jaundice - (all)	93	51.7
Primary tool for follow up - (Sputum examination)	90	50.0

**TABLE 2: DISTRIBUTION OF PRIVATE PRACTITIONERS ACCORDING TO THEIR PRACTICES ABOUT DIAGNOSIS AND MANAGEMENT OF TUBERCULOSIS (N = 180)**

Practices	Number	(%)
Sputum microscopy used for the diagnosis of TB patients	93	51.6
Sputum microscopy used for follow up of TB patients	72	40.0
Referred to Govt. places to get investigation done	105	58.3
Two sputum samples used for diagnosis and monitoring	63	35.0
Duration of treatment followed as per RNTCP	96	53.3
Treatment given in two phases (IP & CP)	120	66.6
Supervised treatment given	24	13.3

Treat TB patients suffering from HIV	66	36.7
Have material to spread awareness about TB in community	69	38.3
Alternate day regime prescribed	75	41.6
Prescription of anti TB drugs as per RNTCP guideline	39	21.7

**TABLE 3: ASSOCIATION OF SOCIO-DEMOGRAPHIC FACTORS AND TB KNOWLEDGE (N=180)**

Variables	Total	Knowledge		Odds Ratio	Chi-Square	P-value
	N (%)	Satisfactory {n1 (%)}	Unsatisfactory {n2 (%)}			
Age (in years)						
<40	108 (60.0)	73 (67.6)	35 (32.4)	1.67	2.68	> 0.05
>= 40	72 (40.0)	40 (55.5)	32 (44.5)			
Gender						
Male	156 (86.7)	99 (63.5)	57 (36.5)	1.24	0.23	>0.05
Female	24 (13.3)	14 (58.4)	10 (41.6)			
Educational qualification						
Graduate	129 (71.7)	69 (53.5)	60 (46.5)	0.18	16.81	<0.05
Post graduate	51 (28.3)	44 (86.3)	07 (13.7)			
Type of practice						
General	132 (73.3)	72 (54.5)	60 (45.5)	0.20	14.36	<0.05
Specialist	48 (26.7)	41 (85.4)	07 (14.6)			
Duration of practice						
<=10 years	123 (68.3)	63 (51.2)	60 (48.8)	0.48	4.69	<0.05
>10 years	57 (31.7)	39 (68.4)	18 (31.6)			
Area of practice						
Urban	72 (40.0)	51 (70.8)	21 (29.2)	1.80	3.33	>0.05
Rural	108 (60.0)	62 (57.4)	46 (42.6)			
Underwent training on TB						
Yes	111 (61.7)	105 (94.6)	06 (05.4)	133.4	125.44	<0.05
No	69 (38.3)	08 (11.6)	61 (88.4)			
Total	180 (100.0)	113 (62.8)	67 (37.2)			