



Awareness of STCI among medical practitioners in Ernakulam District, Kerala, India

MA Binil Salam¹, Asmitha Anilkumar Mehta², Akhilesh Kunoor^{3*}, Nithya Haridas⁴, PT James⁵

¹ Consultant Pulmonologist, MVR Cancer Centre, Kozhikode, Kerala, India

² Professor, Respiratory Medicine, Amrita Institute of Medical Sciences, Amrita Viswa Vidyapeetham, Tamil Nadu, India

^{3,4} Associate Professor, Respiratory Medicine, Amrita Institute of Medical Sciences, Amrita Viswa Vidyapeetham, Tamil Nadu, India

⁵ Professor & HOD, Pulmonary Medicine, Amrita Institute of Medical Sciences, Amrita Viswavidyapeetham, Tamil Nadu, India

Abstract

Background: More than 50% of total Tuberculosis management is being done in private sector in India. It varies from single doctor clinics to tertiary care centres and also include alternative systems of medicine. Government of India and Central TB Division came with Standards of TB Care in India in 2012 with the aim of standardising diagnosis and management of Tuberculosis. Here we are trying to assess the awareness regarding Standards of TB care in India (STCI).

Objective: To assess the awareness regarding Standards of TB Care in India among clinicians in Kochi Municipal corporation.

Materials and Methods: Cross sectional questionnaire based study using self-made semi structured questionnaire among medical practitioners in Kochi Municipal Corporation.

Proportion of “compliant “practitioners working in public and private sector were calculated separately. The key outcome variables were the number (proportion) of practitioners following the STCI Standards for Treatment, diagnosis and notification. Questions 4 to 9 were based on standards for diagnosis, 10 to 13 on treatment and 14 to 17 on standards for notification.

Statistical analysis were performed using IBM SPSS version 20.0 software. Categorical variables were presented using frequency and percentage. Numerical variables were expressed using mean and standard deviation. To find the statistical significance in knowledge scores between private and public level doctors, chi-square test was used. P value<0.05 was considered as statistically significant.

Results: 82% of the practitioners knew that Tuberculosis should be suspected in patients with cough for lasting for more than 2 weeks. Regarding the STCI prescribed standards for treatment of Tuberculosis, only 31% of the study population were aware about the standard regimen for treating a new case of TB. Fifty six percent of the practitioners knew that the Tb cases should be notified. As per grading, 26 doctors were having good knowledge, 53 with average and 26 being poor in knowledge. Most of the findings are comparable with previous studies

There is statistically significant difference in the knowledge among the private and public sector practitioners. (p value =0.01. There is a need for extensive measures for strengthening the awareness of STCI.

Keywords: tuberculosis, STCI, standards of TB care, private practitioners

1. Introduction

India accounts for one fourth of global TB burden. Being a country with diverse socio demographic profile, tackling Tuberculosis is a real challenge in India. Lack of access to health care, delay in diagnosis and treatment, and utilization of unorganized private sector along with other modalities of treatment complicate the issue. India's RNTCP program is a well appreciated successful national program where there was consistent achievements in global targets. But emerging drug resistance and TB-HIV co infection has increased the burden of TB in India. Real burden of caseload is not attained because of poor notification especially from private sector. Standards of TB care in India (STCI) has been developed by Central TB Division and WHO country office for India in 2014 for improving diagnostic and treatment standards in TB Care and also to involve private sector. STCI has outline 26 standards. This study is to assess the awareness of STCI among Medical Practitioners in

Ernakulam district which is a hub of secondary and tertiary care private hospitals.

2. Objective

To estimate the proportion of medical practitioners within Ernakulam district who are familiar with the STCI prescribed standards for screening, diagnosis, treatment, monitoring treatment response and notification of tuberculosis cases.

3. Method

Study was conducted from January 2015 to February 2016. It was a cross-sectional quantitative study among the medical practitioners (comprising both private and public sector doctors) in Kochi Municipal Corporation. It was a self-administered semi structured questionnaire study. A sample of 100 modern medicine doctors who were actively treating Tuberculosis were included in the study.

Practitioners were underwent personal interviews with questionnaire. Institutional ethical clearance taken and informed consent was taken from each participants.

Proportion of “compliant “practitioners working in public and private sector were calculated separately. Data collected include the baseline characteristics like age, gender, duration of practice, the type of practice (private or public practice) and average number of TB patients seen in a year. The key outcome variables were the number (proportion) of practitioners following the STCI Standards for Treatment, diagnosis and notification

a. Data collection and variables

We used a semi-structured questionnaire which was pilot tested and standardised which consisted of multiple choice questions. If the answer met the standard expected response, it was considered as correct and if it deviated from the principles in the standards, it was considered as incorrect. Proportion of “compliant “practitioners working in public and private sector were calculated separately. All the data collection forms were checked for completeness and consistency by the principal investigator and corrections were made.

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Statistical analysis were performed using IBM SPSS version 20.0 software. Categorical variables were presented using frequency and percentage. Numerical variables were expressed using mean and standard deviation. To find the statistical significance in knowledge scores between private and public level doctors, chi-square test was used. P value<0.05 was considered as statistically significant.

4. Results

A total of 100 medical practitioners were enrolled in the study. The study population consisted of 47 females and 53 male practitioners. The mean age of the population was 38 years. Years of expertise in the field of medicine ranges from 1 to 34 years with a mean of 9 years. 93% of them had actively treated Tuberculosis in the past 1 year, (mean being 8 patients). 48% of the practitioners worked in the public sector and 52% of them were in private sector.

Baseline demographics are shown in Table 1.

Table 1: Base line demographics

Variable		Range
Number of subjects	100	
Age (yrs)		
	38.22±9.36	27-64
25-34	40	
35-44	39	
45-54	12	
>55	9	
Female: Male	47:53	
Experience (yrs)		
	9.46±8.20	1-34
≤5 years	42	
6-10 years	31	
11-20 years	14	
Above 20 years	13	
Type of practise		
Public	48	
Private	52	

a. Awareness about the standards for diagnosis

In the study 82% of the practitioners knew that Tuberculosis should be suspected in patients with cough for lasting for more than 2 weeks. This comprised of 41 (81%) private and 40 (76%) public practitioners. 47% of the private practitioners and 55% among public practitioners were aware that sputum microscopy should be used to confirm the diagnosis of active pulmonary tuberculosis rather than Tuberculosis skin test or interferon gamma release assay. WHO and national program have banned serological tests to diagnose active TB. 78% of the practitioners were aware that 2 sputum samples, one spot sample and one early morning sample should be microscopically tested for bacteriological confirmation of tuberculosis. The number of sputum samples for AFB smear was reduced from three to two considering the consensus that two samples are almost as good as three samples which will reduce the overburden on outnumbered designated microscopy centres. As per STCI wherever resource permits, line probe assay should be

used for drug susceptibility testing to rule out multi drug resistant tuberculosis. Only 56% of the practitioners adhered to this recommendation. 73% of the practitioners were aware when to suspect multi drug resistant tuberculosis i.e., MDR suspect criteria. There were no statistically significant difference in knowledge in any of the questions among the practitioners in private and public sector (p value >0.05).

b. Awareness about the standards for Treatment

Regarding the STCI prescribed standards for treatment of tuberculosis, only 31% of the study population were aware about the standard regimen for treating a new case of TB which consist of an Intensive phase of 2 months with Rifampicin(R), isoniazid (H), ethambutol (E) and pyrazinamide (Z) followed by 4 months of continuation Phase with rifampicin, isoniazid and ethambutol. 19 Public practitioners (40%) and 12 private practitioners (22%) were adhering to the standard regimen. If a new smear positive TB case continues to be sputum positive at the end of

intensive phase i.e., after 2 months, drug susceptibility testing should be done to rule out multi drug resistance and should proceed to continuation phase without extending the intensive phase. Positive response were obtained from 60% of practitioners (31 (58%) vs. 34 (72%), private and public practitioners respectively). The difference in the awareness among the two groups were not statistically significant in any of the questions (p value >0.05)

c. Awareness about the standards for monitoring and notification

Fifty six percent of the practitioners knew that the TB cases should be notified. This comprised of 33 public (70%) and 23 private practitioners (43%). STCI has recommended a patient centred strategy for monitoring treatment response and adherence which should be delivered by a “trained provider” or “treatment supporter”. 78% of the practitioners had given correct response (35 private (66%) vs. 43 public (91%) practitioners). Awareness among the public practitioners about the standards for monitoring and notification was found to be superior compared to their

counterpart, which is statistically significant. (p value= 0.02 and 0.01 respectively).

Proportion of medical practitioners (working in private or public sector) who are aware about the standards for screening, diagnosis, treatment and notification of Tuberculosis as per STCI is depicted in Table 2.

Based on the number of questions answered correctly, knowledge of the practitioners were graded as good (8-10), average (5-7) and poor (<7). As per grading, 26 doctors were having good knowledge, 53 with average and 26 being poor in knowledge. Among the private practitioners 13, 29 and 6 were graded as poor, average and good in knowledge respectively. Among the public sector practitioners, 8, 24 and 20 were graded as poor, average and good in knowledge respectively. There is statistically significant difference in the knowledge among the private and public sector practitioners. (p value =0.01)

Grading of the practitioners as per the knowledge on prescribed standards for diagnosis, treatment and notification of TB cases is depicted in Fig 1.

Table 2: Proportion of medical practitioners (working in private or public sector) who are aware about the standards for screening, diagnosis, treatment and notification of Tuberculosis as per STCI

	Sector				Total (n=100)	p Value
	Public		Private			
	n=48	%	n=52	%		
Diagnosis						
Cough of 2 weeks	41	85	41	78	82	0.55
Diagnostic tool	26	54	25	48	51	0.68
No of sputum samples	39	81	39	75	78	0.60
MDR ¹ diagnostic tool	27	56	29	55	56	1.00
MDR suspect criteria	37	77	36	69	73	0.51
Treatment						
Regimen	19	39	12	23	31	0.11
If smear positive at 2 months	10	20	10	19	20	1.00
Notification						
Whom to notify	33	67	23	44	56	0.02
Monitoring by trained provider	43	89	35	67	78	0.01

Table 3: Mean score of the practitioners

Type	N	Mean	Standard Deviation	p value
Private	52	5.38	1.97	0.006
Public	48	6.43	1.73	
Total	100	5.89	1.92	

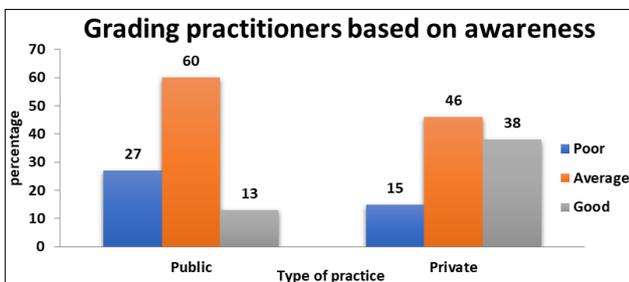


Fig 1: Grading of the practitioners as per the knowledge on prescribed standards for diagnosis, treatment and notification of TB cases (good = more than 7, Average = 5-7, poor = less than 5)

5. Discussion

There are many studies about the awareness of private and public sector doctors on TB care and prescription practices in the literature [1, 2]. But there is no single study on assessing knowledge about STCI recommendations. The

results from the study highlight some thought evoking findings. The overall knowledge among the practitioners in the current study was less. The mean score of the practitioners was 5.8. The mean score of private practitioner was 5.4 and that of public practitioner was 6.44 which was statistically significant difference. As per the systematic review by Satyanarayana *et al* on quality of TB care in India (comparing 47 studies), results showed major gaps in provider knowledge and practice when benchmarked against international standards, among both public and private sectors³. Unlike previous studies from India based on ISTC standards, the awareness on TB management as per STCI standards was better in public when compared to private sector doctors as per our study.

a. Standards for Screening and diagnosis

Only about 50% of the practitioners knew that the sputum microscopy is the recommended diagnostic test to confirm active TB, while 3%, 10% and 17% believed that TB can be diagnosed on the basis of serological test, IGRA and mantoux respectively. This finding was comparable to other published studies. This is in agreement with study by Jarosławski *et al.* [4] in 2012 which estimated 1.5 million serological TB tests, mainly enzyme-linked immunosorbent

assays, were performed in India alone every year, mostly in the private sector in the year. Serological tests were banned by WHO in India in the year 2012. This points out a positive change in the attitude of practitioners since only 3 practitioners in the study opted serology as the investigation of choice in our study. Twenty seven percent doctors opted IGRA and mantoux as the investigation of choice, which needs to be addressed as it can lead to wrong or over diagnosis and unwarranted administration of anti-TB treatment to a large number of patients in a country like India with high disease burden.

The positive predictive value of sputum smear result is more than 90%, while that of chest X-ray is around 66%. Still 20% preferred chest xray over sputum microscopy to confirm active TB in the current study. Over dependence on chest xray can lead to incorrect diagnosis and management and so doctors should be sensitized about value of sputum AFB smear for confirmation of diagnosis of TB.

More than 80% of the practitioners believed that patient with cough for more than 2 weeks should be evaluated for TB. That shows awareness of practitioners about common presenting complaint of TB and it indirectly will help to diagnose TB early. A systematic review of 23 studies has shown that, on an average, TB is diagnosed in India after a delay of about 2 months^[5].

Considering the rising burden of drug resistant TB cases in India STCI has recommended Line Probe Assay (LPA) as the diagnostic test for MDR-TB which is rapid with high sensitivity and specificity. LPA is made available within most states of the country under "End Tb strategy" by the National program. But the awareness among the practitioners about the LPA being the recommended diagnostic test for MDR TB was only 56%. A definitive strategy should be devised at the earliest to promote the utilization of LPA and prompt diagnosis of drug resistant TB.

In present study, 75% of the practitioners were aware about the MDR suspect criteria. Study conducted by Atre S *et al* showed that 11% of patients who had been placed on first-line anti-tuberculosis treatment (category I) actually had a history of previous TB treatment^[6].

There was no statistically significant difference among the private and public practitioners in knowledge about the standards for screening and diagnosis, whereas most of the other studies has shown significant difference among the 2 sectors when ISTC recommendations were put to test^[3].

b. Standards for treatment

High relapse rate of 11-13% has been reported in patients treated by DOT in the RNTCP in India from different locations over the last 20 years. In India, isoniazid resistance is 11% in untreated TB patients and 37% in previously treated cases and the prevalence of HIV co-infection is 5%. So Ethambutol has been added as a third drug in the continuation phase for treatment of new cases. Only 31% of the practitioners were aware about this recommendation. When adding up the STCI and ISTC recommendations, about 84% of the practitioners were correctly prescribing anti-tuberculous treatment. This awareness was estimated to be less than 50% in most of the studies^[3]. Even though awareness is higher in the current study, it needs to improve to achieve the goals of 90% reduction in TB incidence rate as per "End TB strategy" of national program^[7].

Regarding monitoring treatment response, awareness was merely 20%. STCI recommended to do DST and proceed to continuation phase in case of smear positivity at the end of two months of intensive phase ie, not to extend intensive phase. But surprisingly there was no statistically significant difference in knowledge about the STCI standards for treatment of TB between the private and public practitioners, whereas most of the previous studies highlighted poor knowledge among the private sector doctors^[3].

c. Standards for Notification

The challenges of TB control in India are magnified by the existence of parallel systems for TB diagnosis and treatment – the public and private. Even when the "End TB Strategy" aims to reduce incidence of tuberculosis by 90%, study by Wells *et al* found that number of TB patients treated in private sector was twice as many as the public sector. Burden of TB cases were two to three times higher than currently assumed.⁸ TB has been made a notifiable disease by the Government of India. Only 56% of the practitioners were aware whom to notify a case of TB, which comprised of 67% of public and 44% of the private practitioners. This disparity was statistically significant.

DOT has been the backbone of the national program. It aims at a patient centered approach by ensuring treatment adherence by a trained treatment supporter. About 78% of the practitioners were in agreement with the standard. But there was a statistically significant disparity between both the groups (89% among public and 67% among private sector). 7 of 10 studies reported that less than half of the providers used DOT or a supervised approach^[3].

Study Limitations

The results of the study may not be generalized to whole of the state of Kerala, as the population put to test is a convenient sample due to resource limitations. The study is questionnaire based assessment of knowledge. The attitude and practice was not assessed. It is likely that doctors will answer with a response that they think is correct, rather than what they would do in actual practice. Finally it was not clear whether quality of care was related to patient load or to characteristics of the health facilities.

Implications for Policy and Practice

The study highlights the need for rapid and effective interventions to uplift the quality of Tb care. The economic burden of TB is extremely high. Between 2006 and 2014, TB cost the Indian economy a massive USD 340 billion. These efforts will be in vein if the quality of TB care is not up to prescribed standards.

Since STCI has set the standards, efforts should be made to sensitize the practitioners. Regular workshops and teaching program should be organized with an extra effort to indulge more private practitioners. Irrespective of the public or private facility, the algorithm for diagnosis and treatment should be as per standards so that irrelevant diagnostics tests and prescription error may be minimized. Indian Medical Association (IMA) a with country wide network can play a pivotal role in this regard. Monitoring health care providers' knowledge and practice should become a part of the routine TB surveillance system so that necessary corrective steps can be undertaken and progress can be tracked.

6. Conclusion

Based on the findings from the study, we conclude that the awareness among the medical practitioners about the STCI standards is low and needs to be improved for a standardized quality of TB care.

7. Acknowledgement

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8. References

1. Bronner Murrison L, Ananthakrishnan R, Sukumar S, *et al.* How Do Urban Indian Private Practitioners Diagnose and Treat Tuberculosis? A Cross-Sectional Study in Chennai. Plos one. 2016; 11(2):e0149862.
2. Rakesh PS, Balakrishnan S, Jayasankar S, Asokan RV. TB management by private practitioners. Is it bad everywhere? Indian J Tuberc, 2016; 63:251-254.
3. Satyanarayana S, Subbaraman R, Shete P, Gore G, Das J, Cattamanchi A, *et al.* Quality of tuberculosis care in India: a systematic review. Int J Tuberc Lung Dis. 2015; 19(7):751-63.
4. Jarosławski S, Pai M. Why are inaccurate tuberculosis serological tests widely used in the Indian private healthcare sector? A root-cause analysis. J Epidemiol Glob Health. 2012; 2(1):39-50.
5. Purty AJ, Singh Z, Bazroy J, Chauhan RC, Murugan N. Standards for tuberculosis care in India, a road map to universal access in quality tuberculosis care. J Curr Res Sci Med, 2015; 1:6-11
6. Atre S, D'Souza D, Dholakia Y MN. Observations on categorization of new TB cases: implications for controlling drug resistance. Int J Tuberc Lung Dis, 2007; 11:1152.
7. Who. The End TB Strategy. J Chem Inf Model. 2013; 53(9):1689-99
8. Wells WA, Ge CF, Patel N, Oh T, Gardiner E, Kimerling ME, *et al.* Size and usage patterns of private TB drug markets in the high burden countries. PLoS One. 2011; 6(5):e18964.