Original Article

KNOWLEDGE OF TUBERCULOSIS AND ITS MANAGEMENT PRACTICES AMONGST POSTGRADUATE MEDICAL STUDENTS IN PUNE CITY

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ABSTRACT

The study was aimed to assess the pre and post training knowledge of tuberculosis and its management amongst newly admitted postgraduate students in medical college and hospital. India accounts for nearly one fifth of global burden of tuberculosis. Every year approximately 1.8 million persons develop tuberculosis. Postgraduate students are many times the first contact of patients in teaching as well as secondary and tertiary care hospitals. Considering this fact, the current study was conducted to assess pre and post training knowledge about basic facts of tuberculosis and its management practices. All newly admitted postgraduate students attended RNTCP training and completed pre test and post test questionnaires. Each completed questionnaire was assigned marking system. The data was analysed using paired t test. Significant improvement in knowledge was found after RNTCP Training (Pre test mean marks: 10.25, post test mean marks: 14.36, t=8.43, df=35, p=0). The education of postgraduate students on guidelines for detection and early management of TB is crucial for further improvement in national tuberculosis control strategies. RNTCP training should be a part of regular activity of all medical colleges and hospitals.

Keywords: RNTCP, Pre test and post test, Methodologies, Post graduate medical students

INTRODUCTION

India is the highest TB burden country in the world and accounts for nearly one fifth (20%) of global burden of tuberculosis[1]. Every year approximately 1.8 million persons develop tuberculosis of which about 8, 000, 00 are infectious and until recently 3, 70, 000 cases died of it annually-1000 every day. In India, today two deaths occur every three minutes from tuberculosis but these deaths can be prevented. With proper care and treatment, TB patients can be cured.[2]

The National Tuberculosis Control Programme (NTCP) was reviewed in India in 1992 and Revised National Tuberculosis Control Programme (RNTCP) was drawn and formally launched in March 1997 with phased coverage in various states throughout India.[3]

The postgraduate students are many times a first contact physician of patients in teaching hospital as well as secondary and tertiary care hospital and needs to be oriented towards RNTCP policies and strategies in order to reduce TB burden.

The present study attempts to understand the knowledge and management practices of newly admitted postgraduate students pertaining to tuberculosis before and after RNTCP training.

OBJECTIVE

To assess pre and post training knowledge and management practices of newly admitted

postgraduate students pertaining to tuberculosis, as envisaged under RNTCP.

MATERIAL AND METHODS

The study was conducted amongst 36 postgraduate students. All were first year students enrolled for various disciplines of Bharati Vidyapeeth Deemed University Medical College and hospital Pune. RNTCP Training was organized as a part of routinely scheduled programme activity of college and hospital. Training faculty was chosen from people who underwent training at National Tuberculosis Institute (NTI), Bangalore.

The pretested self administered structured questionnaires were distributed to all participants. Participants were allowed 20 minutes to complete questionnaire under strict supervision. Modular Training was conducted by trained facilitators subsequently. Methodologies like role play, demonstration, socratic method of communication, group discussion, question-answer sessions, posters, printed handouts, film show, setting up novel examples etc. were incorporated in training programme. At the end of training programme, the same questionnaires were distributed to all participants and responses collected. The marking system for each complete question was assigned. The data was entered in Microsoft office excel sheet and analyzed using paired 't' test.

RESULTS

Of 36 newly admitted postgraduate students, twelve were from Paediatric and six were from Microbiology department. Three students participated from Obstetrics and Gynaecology, Orthopaedics and Dermatology department each. Two students each were from Pathology and Community Medicine department. Department of Pulmonary Medicine, Otorhinolaryngeology and Psychiatry sent one student each for participation.

Table1: Mean marks of participants

	Mean marks (out of 20)	S.D.	t value	df	p-value
Pre test	10.25	3.45	8.43	35	0
Posttest	14.36	2.94			

Figure 1: Question wise mean marks in pre test & post test
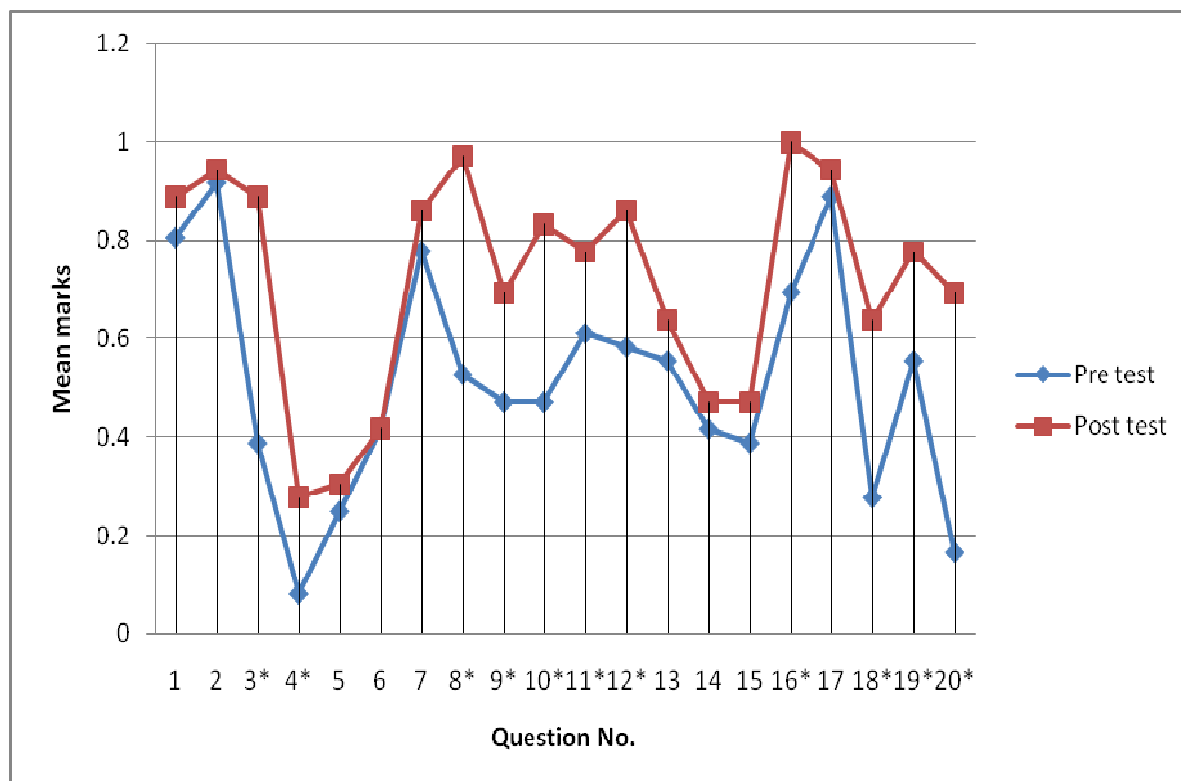
* Statistically significant difference was observed.

Table 2: Number of participants with correct responses in pre test and post test (n=36)

	Pre test (%)	Post test (%)	t value	p-value
1. Tick the correct statement: a) TB Kills more adults in India than any other disease b) TB Kills less adults in India than any other disease c) TB is one of the leading infectious causes of deaths in India* d) All of the above	28(77.78)	32(88.89)	1.78	0.08
2. Most common symptom of pulmonary tuberculosis is: a) Heamoptysis b) Persistent cough of 2 weeks or more than 2 weeks with or without expectoration* c) Fever d) Weight loss	32(88.89)	34(94.44)	0.57	0.57
3. The objectives of RNTCP are to achieve and maintain: a) Cure rate of at least 60% among newly detected smear positive TB cases and case detection of at least 50% of expected new smear positive PTB cases in a community b) Cure rate of at least 70% among newly detected smear positive TB cases and case detection of atleast 80% of expected new smear positive PTB cases in a community c) Cure rate of at least 85% among newly detected smear positive TB cases and case detection of at least 70% of expected new smear positive PTB cases in a community* d) Cure rate of at least 90% among newly detected smear positive TB cases and case detection of at least 80% of expected new smear positive PTB cases in a community	14(38.89)	32(88.89)	5.92	<0.001
4. What are five components of DOTS:¶	3(8.33)	10(27.77)	2.22	0.03
5. Indications for sputum examinations: a) A person with cough of 2 weeks or more b) HIV positive patient with cough of any duration c) Suspected/confirmed extra pulmonary TB with cough of any duration d) Contacts of smear positive TB patient*	2(5.55)	4(11.11)	0.53	0.60
6. A TB suspect with two -ve smears should be subjected to: a) Chest X-ray b) If cough persists despite 10-14 days of a general antibiotic, a chest X-ray is taken c) If cough persists despite 10-14 days of a general antibiotic, should have a repeat 2 smear examinations performed* d) Should be given 10-14 days of ciprofloxacin	15(41.66)	18(50)	0	1
7. In Ziehl-Neelsen staining following reagent is not used: a) Carbol fuchsin b) Sulphuric acid c) Methylene blue d) Carbolic acid*	28(77.77)	31(86.11)	1.78	0.08
8. No of sputum samples required for diagnosis of smear positive cases are: a) One b) Two* c) Three	19(52.77)	35(97.22)	4.78	<0.001

		Pre test (%)	Post test (%)	t value	p-value
d)	Four				
9.	Under RNTCP 'New Case' is defined as: a TB patient who has never had treatment for TB or has taken anti-TB drugs	18(50)	25(69.44)	2.75	0.009
a)	Less than 1month*				
b)	Less than 2 months				
c)	Less than 6 months				
d)	None of the above				
10.	Family member can be DOT provider:	17(47.22)	30(83.33)	3.99	0.0003
a)	True				
b)	False*				
11.	False statement about Intermittent regimen of DOTS:	22(61.11)	28(77.77)	2.24	0.03
a)	Less expensive				
b)	Few adverse reactions				
c)	Less effective than daily regimen*				
d)	Reduction in total quantity of drug consumed				
12.	Treatment regimen for smear positive case in RNTCP:	20(55.55)	31(86.11)	3.67	0.0008
a)	$2(HRZE)_3/4(HR)_3$*				
b)	$2(SHRZE)_3/1(HRZE)_3/5(HRE)_3$				
c)	$2(HRZ)_3/2(HR)_3$				
d)	None of the above				
13.	Contraindicated anti-TB drug in pregnancy	20(55.55)	23(63.89)	0.90	0.37
a)	Rifampicin				
b)	Streptomycin*				
c)	Isoniazid				
d)	Pyrazinamide				
14.	The follow up sputum smear examination for New Case of TB will be done at:	15(41.66)	18(50)	0.70	0.49
a)	2,4,6 months*				
b)	2,6 months				
c)	2,3,5,7 months				
d)	2,3,4,6,8 months				
15.	RNTCP policy on chemoprophylaxis is:	15(41.66)	17(47.22)	0.90	0.37
a)	Give INH for 6 months to child < 6 years who are contacts of TB patient after ruling out active TB				
b)	Give INH for 6 months to child < 6 years who are contacts of TB patient irrespective of BCG status after ruling out active TB*				
c)	Give INH for 3 months to child < 6 years who are contacts of TB patient, then do PPD test				
d)	All contacts of positive TB case receive 6 months of INH				
16.	Multi-Drug resistant tuberculosis (MDR-TB) is defined as:	25(69.44)	36(100)	3.92	0.0003
a)	TB bacilli are resistant to Isoniazid & Rifampicin with or without resistance to others*				
b)	Resistant to Isoniazid only				
c)	Resistant to Rifampicin only				
d)	All of the above				
17.	Best method of prevention of TB is:	32(88.89)	34(94.44)	1	0.32
a)	Active diagnosis of sputum positive case				

	Pre test (%)	Post test (%)	t value	p-value
b) Passive diagnosis of sputum positive				
c) Early diagnosis and treatment of sputum positive case*				
d) Treatment of Mountoux positive case.				
18. Effective drug in TB-HIV confection to reduce mortality:	10(27.77)	29(80.55)	4.44	<0.001
a) Azithromycin				
b) Cotrimoxazole*				
c) Ciprofloxacin				
d) Ethambutol				
19. All are bactericidal drugs except:	21(58.33)	29(80.55)	2.47	0.02
a) Rifampicin				
b) Streptomycin				
c) Isoniazid				
d) Ethambutol*				
20. In RNTCP, ACSM stands for:	5(13.88)	25(69.44)	5.65	<0.001
a) Advocacy, Communication and Social Mobilization*				
b) Advocacy, Communication and Social Motivation				
c) Adherence, Communication and Social Mobilization				
d) None of the above				

df = 35, ¶ Open ended question, * Correct response

DISCUSSION

RNTCP Training of postgraduate medical students is a routine activity at Bharati Vidyapeeth Deemed University Medical College and Hospital, in addition to that of faculty members, interns and paramedical staff of the college. All training programmes are being conducted by trained facilitators including City Tuberculosis Officer, Pune Municipal Corporation forming RNTCP Core Committee of the institute.

RNTCP Training principally focused on essential components of RNTCP like burden of tuberculosis, pathogenesis of TB, symptamatology, diagnosis and treatment services, Advocacy, Communication and Social Mobilization (ACSM) and recent updates in RNTCP.

A modified questionnaire was used based upon the one designed by National Tuberculosis Institute (NTI), Bangalore for medical officer's training. The questionnaire contained a set of 20 questions of which 19 were closed ended and one was open ended. Each completed question was assigned one mark for correct response and zero mark for incorrect response. For one open ended question about DOTS components, one mark is given for responding three or more components and zero mark is given for responding less than three components.

Of 38 medical postgraduate students, two were excluded from study since they did not attend sessions fully.

The pre test and post test mean marks of participants were worked out. Mean pre test marks were 10.25 and the post test marks were 14.36 showing that the training did help in improving knowledge (Table 1). The difference was found to be significant statistically. (t=8.43, df=35 p=0)

The questions were grouped under four broad categories: RNTCP objectives and DOTS components, Diagnosis, Treatment services and ACSM.

A) RNTCP objectives and DOTS components:

Despite RNTCP being part of their undergraduate studies, only 14(38.89%) participants correctly specified RNTCP objectives (Q.No. 3) in pretraining phase. In post training phase, 32 (88.89%) participants could state correct response. Statistically significant difference was observed in pretest (0.39) and post test (0.89) mean marks (t =5.92, df = 35, p <0.001). Similarly highly significant difference in pre test (0.08) and post test (0.28) mean marks (t=2.22, df =35, p=0.03) was observed for DOTS components.

In addition to Power Point Presentation (PPP), group discussion as well as various examples were set up to explain RNTCP objective and DOTS components. These could be the possible

reasons for showing statistically significant difference in pre test and post test mean marks.

Vijayaprasad Gopichandran et al[6] used Power Point Presentation as a tool to provide TB education amongst high school children and found it to be effective.

B) Diagnosis:

All definitions of treatment outcome under RNTCP were explained during role play. Each actor in role play was labelled as a patient with specific treatment outcome. Eighteen (50%) participants in pre test and 25(69.44%) participants in post test defined 'New Case' (Q.No.9) correctly. The difference in mean marks of pre test (0.47) and post test (0.69) was found to be statistically significant. (t=2.75, df=35, p=0.009).

Twenty five (69.44%) participants defined Multi Drug Resistant tuberculosis (MDR-TB) (Q.No.16) precisely in pretesting. After training, all 36 (100%) participants could define it rightly i.e. resistance of TB bacilli to Isoniazid and Rifampicin with or without resistance to other drugs. Statistically significant difference was observed in mean pre test (0.69) and post test (1) marks (t=3.92, df= 35, p= 0.0003). Role play, performed during training period highlighted the concept of MDR-TB.

Recent RNTCP guidelines[8] states collection of two sputum samples for diagnosis of smear positive TB case (Q.No.8). Nineteen (52.77%) participants felt that three sputum samples are essential for diagnosis of smear positive case as revealed during pretesting session. At the end of session, significant increase in knowledge was observed (pre test mean marks=0.53& post test mean marks=0.97) with correct response given by 35(97.22%) participants (t=4.78, df=35, p <0.001).

The topic was more stressed during role play and group discussion including demonstration on 'How to yield good quality sputum sample from patient'.

Statistically significant difference was revealed for the questions related to 'Diagnosis'. The difference could have been observed due to combined use of methodologies like role play, group discussion, demonstration, display of posters etc.

Stewart KE et al.[7] reported that workshop including role playing exercises and question-answer sessions resulted in improved knowledge and attitudes of nurses regarding HIV/AIDS.

C) Treatment services:

It has been proved that Intermittent regimen of DOTS is equally effective as daily regimen[8] (Q.No.11). Twenty two (61.11%) participants gave the correct response in pre test and the same was increased to 78% in post test (t=2.24, df=35, p=0.03).

Printed Handouts containing comparative features of daily regimen and intermittent regimen were distributed to participants. In a study[6] of similar nature, printed handouts were used as a education tool to educate participants about tuberculosis.

RNTCP guidelines emphasize that family member cannot give DOTS (Q.No.10). During pretesting, eighteen (50%) participants thought that family member can be a DOT provider. One film was shown related to it. During post testing, thirty (83.33%) participants realized that DOTS should not be given by family member. The difference was found to be statistically significant (t=3.99, df=35, p=0.0003).

Audio-visual mode of health education session was used as a simple educational intervention on the knowledge and awareness of TB amongst high school children by Vijayaprasad Gopichandran et al.[6]

Amongst all first line anti TB drugs (Q.No.19), Ethambutol is bacteriostatic drug while other drugs are bactericidal. During pretesting, 21(58.33%) participants and during post testing 29(80.55%) participants correctly stated that Ethambutol is a bacteriostatic drug. The difference was found to be statistically significant. (t= 2.47, df=35, p=0.018)

Cotrimoxazole is an effective drug to reduce mortality amongst HIV infected TB patients (Q.No.18). Ten participants (27.77%) could specify Cotrimoxazole as a correct option (pre test mean marks = 0.28). Sixteen participants (44.44%) preferred to choose Ciprofloxacin and two participants (5.55%) selected Ofloxacin and Azithromycin as an effective drug to reduce mortality in TB-HIV coinfection. Six participants (16.67%) were unaware of it and gave no response. After training more than two third of participants 29(80.55%) correctly mentioned Cotrimoxazole as an effective drug to reduce mortality among HIV infected TB patients. (Post test mean marks =0.64). Statistically significant

difference was revealed in mean marks of pre test and post test (t=4.44, p < 0.001). This topic was stressed more during group discussion and role play. Adeline Nyamathi, Manju Vatsa et al.[9] found significant improvement of HIV knowledge of nurses from pre test to post test by using teaching strategies like role play, small group sessions and lectures with discussion.

Before training 20(55.55%) participants were aware about treatment regimen for new smear positive case under RNTCP i.e. $2(HRZE)_3/4(HR)_3$ (Q.No.12).Less than one third of participants had no idea about treatment regimen. Eight (22.22%) participants selected other options. Facilitators showed all patient wise boxes to participants and explained all treatment categories rather than explaining it therotically.After training 31(86.11%) participants stated correct treatment strategy for new smear positive case.

The difference in mean marks of pre test (0.58) and post test (0.86) was found to be statistically significant. (t=3.67, df=35, p= 0.0008)

In a KAP survey, A Vijaya Raman, VK Chadha et al.[4] found 9 (60%) had knowledge of NTP regimen amongst 15 allopathic doctors surveyed. Incorporation of 'Role Play' and 'Demonstration' method might be attributed to statistically significant difference in mean marks of pre test and post test for questions mentioned in category of 'Treatment Services'.

D) Advocacy, Communication and Social Mobilization (ACSM):

The intensification of ACSM activities is an essential component of RNTCP (Q.No.20).In pretraining phase, 5(13.88%) of participants stated the full form of ACSM correctly while in post training phase nearly two third (69.44%) of participants were able to give the full form of ACSM accurately. The difference was statistically significant (t= 5.65, df=35, p <0.001)

The present study showed significant improvement in participant's knowledge of tuberculosis and its management practices from pre test to post test. The study carried out in public health workers and DOTS workers by PS Wu, Pesus Chou et al.[5] also found statistically significant improvement in knowledge regarding tuberculosis from pre test to post test.

The topics pertaining to questions for which statistically significant difference was seen in mean marks of participants were covered within first 90 minutes of training session. This together with methodologies like role play, demonstration, Socratic method of communication, printed handouts, film show setting up novel examples, group discussion, question-answer session, posters might be reasons for significant increase in knowledge of participants in post test. Participants were encouraged to ask questions and efforts were done to establish 'two way communication'. Novel examples were used to make point across during training.

Even though the post test score was found more for questions related to most common symptom of pulmonary tuberculosis, correct statement regarding TB, indications of sputum examination, management of smear negative TB, ZN staining, contraindicated anti TB drug in pregnancy, follow up sputum examinations, best method of prevention of TB and RNTCP policy on chemoprophylaxis etc, the difference was not significant statistically.

Clinical practice paradigms are often ingrained in physicians during their post graduate training. Education of postgraduate students on guidelines for detection and early management of tuberculosis is crucial for further improvements in national tuberculosis control strategies.

CONCLUSION AND RECOMMENDATIONS

The study revealed inadequacies in the knowledge of tuberculosis amongst postgraduate students. Their ability to diagnose and manage tuberculosis infection has important public health implications.

'RNTCP Training' should be the part of regular activity of all medical colleges and hospitals. Didactic lecture for delivering information need to be replaced by methodologies like role play, demonstration, question- answer session, Socratic method of communication, setting up various examples film show, printed handouts, Posters, Group Discussion etc, for better understanding. More studies are needed to assess the knowledge of postgraduate students on tuberculosis and its management practices especially in reference to RNTCP.

ACKNOWLEDGEMENT

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