Original Research Article

Knowledge, Attitude & Practices of hospital residents regarding utility of CBNAAT in Tuberculosis

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Abstract

Background: India is bearing the highest Tuberculosis burden in the world. For its accurate & rapid diagnosis it is imperative to keep residents abreast of all latest guidelines regarding utilization of CB-NAAT, a promising new tool endorsed by national programmefor tuberculosis. **Method:** It was a hospital based descriptive study conducted at a tertiary care hospital in Faridabad, Haryana. A self-designed, structured questionnaire was administered to junior and senior residents (N=120). Knowledge level was based on 16 item knowledge score, attitude was assessed by Likert scale and practices were expressed in percentages. **Results:** Only 35.5% residents were having good knowledge level whereas rest were having average (58.3%) or poor (6.7%)level of knowledge regarding CBNAAT utility. A statistically significant positive association was observed between higher qualification and years of post MBBS experience. Majority of residents had positive attitude towards most aspects of CBNAAT utility. Surprisingly only 64.58% residents were practicing CBNAAT testing for tuberculosis detection & management. **Conclusion:** The study found huge gaps in the knowledge, attitudes and practices among residents leading to low utilization of CBNAAT demanding efforts for sensitization and adequate training of healthcare staff.

Keywords: CBNAAT, Hospital Residents, Tuberculosis

Introduction

Tuberculosis (TB) is a dreadful disease and remains a major challenge to global public health. As per Global Tuberculosis Report-2019, worldwide 10,000,000 people fell ill and 1,500,000 died of TB in the year 2018. [1]The situation has further worsened by the emergence of Multidrug resistant tuberculosis (MDR TB). Early identification of presumptive Tuberculosis cases and their confirmation by using the most appropriate laboratory test determine the outcome. [2] Inadequate diagnostic assays for diagnosis of TB further complicate the situation.The most common method for microbiological diagnosis of Tuberculosis is Acid fast microscopy, though, it has limited sensitivity. TB culture is a slow method which takes 4-8 weeks for growth of mycobacterium and often fails to distinguish between mycobacterium tuberculosisfrom non-tuberculosismycobacterium disease. Overreliance on culture often leads to considerable delays, compromising patient care and outcomes.[3] Diagnosis of TB still remains a challenge in extrapulmonary TB, paediatric cases as well as immune-suppressed HIV patients. Hence, there is a growing need to look for systems beyond conventional methods for diagnosis of new cases. In such scenario, role of cartridge based nucleic acid amplification test (CBNAAT), a Real Time PCR-based method is highly promising.

CBNAAT has two key advantages for the diagnosis of tuberculosis (TB). First, its sensitivity is high both for pulmonary and extrapulmonary TB and second it can detect rpoB gene mutations that confer rifampicin-resistance (RR-TB). [4, 5] GeneXpert [Cepheid's] is the CBNAAT system endorsed by WHO and is being used in India under RNTCP guidelines. It is available at most of the chest clinics in district hospitals and medical colleges. Its use is recommended for diagnosis of Drug resistant TB in presumptive cases as well as in diagnosis of TB in crucial populations such as pediatric cases and among people living with HIV[PLHIV]. Recently, RNTCP has increased scope of CB-NAAT to include cases of extra pulmonary TB too.

In hospitals, residents (juniors/senior)being the first contact health care provider of patients need to be sensitized towards recent updates in RNTCP guidelines including utilization of CB-NAAT so that rapid and accurate diagnosis of TB can be made in maximal patients. Hence, this KAP study was conducted to assess the existing knowledge, attitude & practices among residents regarding CB-NAAT and analyze the need for conducting trainings.

Methodology

Present study was a hospital based; descriptive type of cross-sectional study conducted from August-September 2019. The study was conducted among all Junior and Senior Residents of ESIC Medical College &Hospital, Faridabad, Haryana. Department of Microbiology is one of the 21 RNTCP Designated Microscopy Centres (DMCs) as well as a DOTS centre under District, Faridabad.

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CB-NAAT testing facility is available in the District hospital, Faridabad which is also the District Chest clinic,adjoining since 2016. The samples of suspected TB cases from medical college for CBNAAT are sent todistrict hospital where CB-NAAT testing is done free of cost by the government.

All resident doctors in different years of their residency (Junior and senior residents) from various disciplines were included in this study. Only those who were not willing to participate were excluded.

Study tool was a self-designed, self- administered questionnairebased on current RNTCP guidelines and validated by a team of experts including a microbiologist, a clinician and an epidemiologist with adequate experience in TB and KAP analysis.

The questionnaire had four parts. First part pertained to socio-demographic data including experience of health care and any TB related training undertaken. The second part of the questionnaire dealt with knowledge component: clinical indications, types of samples approved, sample collection, transport and storage for CBNAAT. There were 16 questions in the Knowledge section. One mark was allocated to each question. If the participant didn't answer that question, the response was marked as incorrect and thus the total collect response was calculated. Knowledge score was calculated out of a total maximum of 16. Knowledge level of the subjects was classified into three categories on the basis of their knowledge score. Those having score less than 5 were classified as poor, between 6-10 were average and 11-16 as having good knowledge level. Third part captured attitude of the residents towards CBNAAT for tuberculosis diagnosis. Attitude was assessed on the basis of three dimensions – utility of CBNAAT in detection of pulmonary &extrapulmonary TB, its utility in detecting rifampicin resistance and overall satisfaction with this test and using a five-pointLikert Scale. All those who agreed or strongly agreed were considered to have positive attitude and those, who disagreed, strongly disagreed or didn't respond were considered to have negative response to this test. Fourth part was related to actual practices among residents pertaining to CBNAAT testing and their views on day-to-dayproblems faced by them with respect to this test.

The study was conducted after approval by the institutional Ethics committee. The purpose of study was fully explained to the study participants & their verbal consent was obtained. Confidentiality was maintained at all levels of study by avoiding use of name or other identifiers.

Data was entered in Microsoft excel. Commercially available statistical software (SPSS version 21) was used for analysis. Results are expressed as absolute numbers and percentages. Chi- Square test with or without Yates correction was applied to test differences in proportions. Differences were considered to be statistically significant at p- value < 0.05.

Results:

This study was conducted among 120 residents working in various disciplines at a tertiary care hospital in Faridabad city of Haryana.

Demographic profile

More than half of study participants were in the age group 29-32 years(51.7%). Male(50.8%) to female (49.2%) ratio was almost equal. Majority (70%) were senior residents having postgraduate degree. Participation from surgical & Allied branches was bit more (54.2%). 57.5% residents were having more than 4 years of post MBBS experience but surprisingly only 15.8% have undergone any tuberculosis specific training. [Table1]

Knowledge Level

Level of knowledge regarding CBNAAT testing was decided on the basis of 16 item knowledge score. Based on it, participants were classified into three categories i.e having poor, average or good knowledge level. 58.3% residents were having satisfactory knowledge level, 35.5% good whereas 6.7% had poor level.[Fig 1]

Study results revealed that based on knowledge score, participants having postgraduate degree had better knowledge level (satisfactory/good) than those possessing MBBS degree. Also, it was observed that theknowledge level improves with number of years of experience. This positive association of knowledge level with qualification and years of experience was found to be statistically significant. [Table 2]

Attitude

Attitude regarding utility of CBNAAT was based on three dimensions and was assessed by using Likert scale.

First dimension of the attitude was utility of CBNAAT in diagnosis of pulmonary &extrapulmonary TB and it contained 4 items (Question1,3,4&5). Majority strongly agree / agree that CBNAAT helps in making definitive diagnosis of TB(78.12%) improves detection of pulmonary TB (87.49%),improves detection of extrapulmonary TB(67.5%) and reduces time to detect TB(76.04%). However, a substantial number of subjects still disagree/strongly disagree with the role of CBNAAT in diagnosis of TB and few have never experienced its utility.

Second dimension was utility of CBNAAT in detecting rifampicin resistance as reflected in Question2. It was observed that less than a half (41.66%) agree/strongly agrees that CBNAAT has role in detecting rifampicin resistance whereas 5.21% never experienced its utility.

Third dimension was related to individual satisfaction with CBNAAT testing as asked in Question 6. It was found that 91.66% were satisfied with this test and would like to recommend this to others. [Fig 2]

Practices

It was observed that 64.58% residents were practicing CBNAAT testing for tuberculosis detection whereas 28.12 %were not and rest 7.30% didn't respond. Surprisingly 38.54% didn't respond when asked about number of samples being sent for CBNAAT testing every month. However, rest was practicing regular sending of samples in different frequencies.As multiple answers were allowed for type of sample being sent for CBNAAT testing, majority was sending sputum (38.54%) followed by pus (16.67%), body fluids(15.60%), gastric lavage (6.25%) and endo metrial tissue(6.25%). Unexpectedly 44.79% participants did not respond.[Table 3]

Table 1:- Demographic profile of the study population. [N=120]

Variable	N	%
Age (Years)		
25 – 28	38	31.7
29 – 32	62	51.7
>32	20	16.6
Total	120	100.0
Gender		
Male	61	50.8
Female	59	49.2
Total	120	100.0

Qualification		
MBBS	36	30
PG(MD/MS)	84	70
Total	120	100.0
Designation		
JR	36	30
SR	84	70
Total	120	100.0
Discipline		
Surgical + Allie	65	54.2
Medicine + Allied	55	45.8
Total	120	100.0
Post MBBS Experience (Years)		
<4	51	42.5
>4	69	57.5
Total	120	100.0
Undergone Tuberculosis Specific Training		
Yes	19	15.8
No	101	84.2
Total	120	100.0

Table 2: Association of knowledge with Qualification and experience among study subjects. [N=120]

S No.	Variable	Knowledge Level			Total	p-value
		Poor	Average	Good		
1	**Qualification**					
	Undergraduates	4(10.5%)	29(76.3%)	5(13.2%)	38(100%)	0.003
	Postgraduates	4(4.9%)	41(50.0%)	37(45.0%)	82(100%)	
	Total	8(6.7%)	70(58.3%)	42(35.5%)	120(100%)	
2	**Post MBBS Experience (Years)**					
	Upto 2 years	3(8.3%)	28(77.8%)	5(13.9%)	36(100%)	0.009
	2-4years	0(o.o%)	10 (43..5%)	13(56.5%)	23(100%)	
	>4years	5(8.2%)	32(52.5%)	24(39.3%)	61(100.0%)	
	Total	8(6.7%)	70(58.3%)	42(35%)	120(100%)	

Table 3: Practices regarding CBNAAT usage [N=120]

S No.	Practices	%
1	**For TB detection are you sending samples for CBNAAT-**	
	• Yes	64.58
	• No	28.12
	• No response	7.29
2	**Number of samples being sent for CBNAAT testing every month-**	
	• 1-10	34.40
	• 11-20	15.60
	• 21-30	5.21
	• >30	6.25
	• No response	38.54
3	**Which samples are being sent for CBNAAT testing every month-**	
	Sputum	38.54
	Gastric lavage	6.25
	Endometrial tissue	6.25
	Body fluids	15.60
	Pus	16.67
	No response	44.79

***Multiple responses were allowed**

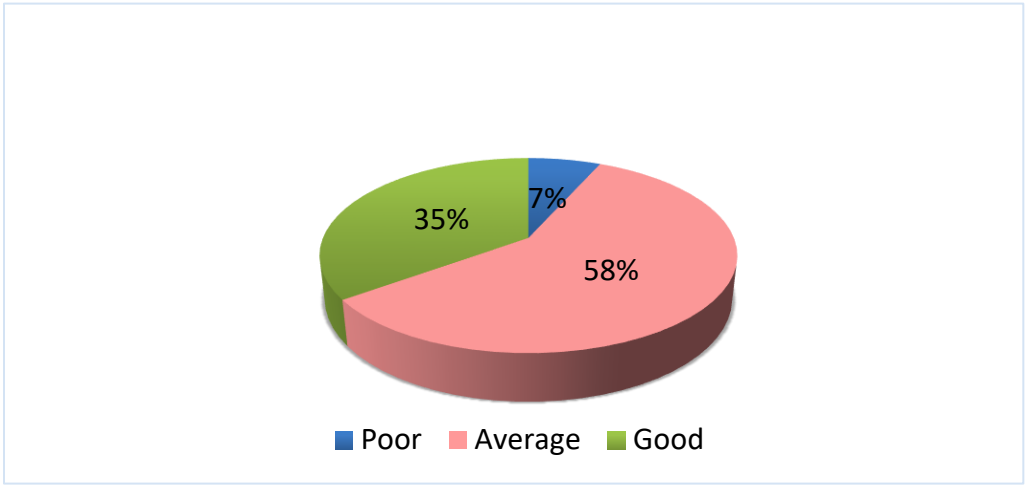

Fig 1: Knowledge level of the study subjects based on knowledge score

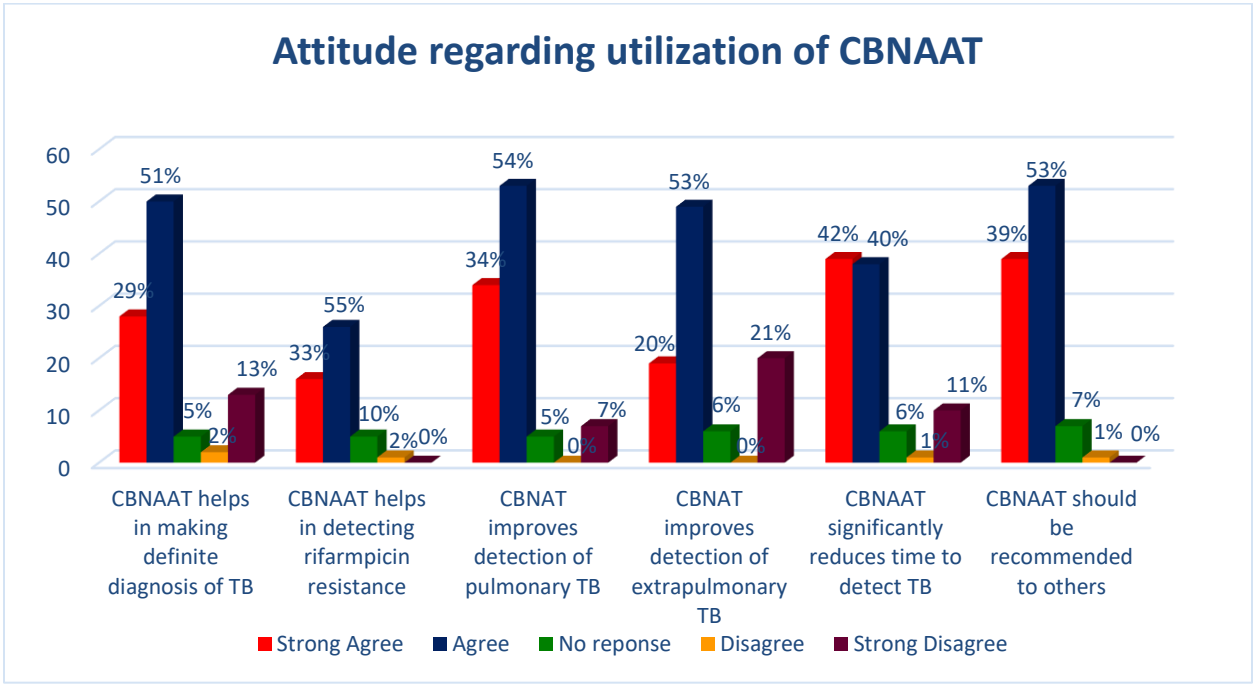

Fig 2: Attitude regarding utilization of CBNAAT

Discussion

Present study was conducted among senior and junior residents working in a tertiary care hospital to assess their knowledge, attitude and practices regarding utility of CBNAAT testing in diagnosis of pulmonary, extrapulmonary and drug resistant TB. To the best of our knowledge, this is a pioneer systematic KAP study conducted on healthcare workers about the utilization of CBNAAT.

Majority (70%) were senior residents. More than half (57.5%) had more than 4 years of post MBBS experience but surprisingly only 15.8% have undergone any tuberculosis specific training. Only senior residents working in Chest & TB department or few from Medicine department had undergone any such training.

Observed knowledge level was average among 58.3%, good in 35.5% and poor among 6.7%. Study results reflected that postgraduates or senior residents with higher qualification and a

greater number of years of post MBBS experience had significantly better knowledge scores. Though residents had a broad concept of CBNAAT as a molecular test for detection of TB and Rifampicin resistance, however, clarity regarding specific conditions where CBNAAT could be utilized was lacking.Nearly 66% residents were unaware of the fact that compared to CBNAAT, AFB microscopy is still the recommended method of diagnosis in a suspected case of pulmonary tuberculosis as per RNTCP algorithm. Knowledge of residents was especially poor w.r.t types of specimens approved for CBNAAT testing as well as their storage(28.12% were aware) and transportation(38.54% were aware). Temperature of the sample during storage and transportation are crucial issues, which can severely compromise the quality of the patient's sample and hugely impact the reporting. Hence, the referring clinicians need to be aware of these factors. The most worrisome aspect was that 32.29% residents were not even aware of the CBNAAT availability in their system. Hence, there is a need to undertake trainings to improve the knowledge domain of the residents through CMEs / workshops/ trainings regarding TB diagnosis and management.

Majority were having positive attitude regarding almost all aspects of CBNAAT utility in diagnosis and management of TB but few disagree/ strongly disagree with the utility of CBNAAT. This disagreement may be because of lack of updated knowledge.

In the present study only 64.58% residents were practicing CBNAAT testing for tuberculosis detection. 78.12% accepted that CBNAAT helps in making definitive diagnosis of TB whereas nearly 35% admitted to have no experience of sending samples for testing. One possible reason for this behavior may be lack of awareness about availability of CBNAAT in the setting and second could be lack of updated knowledge regarding revised guidelines.

When asked about type of sample being sent for CBNAAT testing, majority was sending sputum (38.54%) followed by pus (16.67%), body fluids(15.60%), gastric lavage (6.25%) and endometrial tissue(6.25%). Unexpectedly 44.79% participants did not respond. As the study included residents from all disciplines, few of them like psychiatry, ophthalmology etc. may not require sending samples in routine hence residents from these disciplines either did not respond or said that they are not sending samples for CBNAAT testing. Various studies conducted by Kavita et al and Avashia et al have highlighted role of CBNAAT in diagnosing extrapulmonary tuberculosis. [6,7,8] Since more than 40% residents in present study never experienced CBNAAT utility it is highly impressed upon that post graduate curriculum in each discipline must stress upon TB management and control. As residents/ senior residents are the first point of contact between the patients and the healthcare delivery system, their capacity building through in-service trainings from time to time is of utmost importance.

Conclusion

It has been more than nearly nine years since WHO lauded Xpert MTB/RIF as a "major advance for TB diagnostics" and gave recommendations for widespread usage of this technology. However, knowledge of its existence and purpose remains low as reflected in the present study. This demands extra efforts for training & retraining of healthcare staff.

Conflict of Interest: Nil

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