

## Original Research Article

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# Knowledge attitude and practice of paediatricians regarding tuberculosis case management in five major districts of Punjab state, India

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## ABSTRACT

**Background:** The operational research was done to assess the Knowledge, Attitude and Practice regarding TB case management of Pediatricians. Place were five major cities of Punjab state, India. i.e. Ludhiana, Jalandhar, Amritsar, Patiala and Bathinda.

**Methods:** Study design was observational cross-sectional study. Period was one year. The data collection was done from Paediatricians from 5 cities inhabiting approximately half of the urban population of Punjab, using a pre-tested, structured questionnaire and knowledge of TB and its management was assessed.

**Results:** Total of 139 pediatricians participated in the study, 69% were male. Majority pediatricians had adequate knowledge of TB disease and case suspicion. Adequate knowledge of TB diagnosis was seen in 87% doctors. Only 20% doctors had adequate knowledge about treatment of TB cases. Overall 64% of Pediatricians referred TB cases to DOTS centre for treatment.

**Conclusions:** Improving the treatment knowledge of paediatricians can go a long way in improving management of TB cases.

**Keywords:** DOTS centre, Paediatrician, Punjab, Tuberculosis

## INTRODUCTION

India accounts for one fourth of the global TB cases with highest burden of both TB and MDR TB based on estimates reported in Global TB Report 2016.<sup>1</sup> Proportion of TB cases in children have reported from 6% to more than 10% in few states like Delhi, Chandigarh, Madhya Pradesh.<sup>1</sup> This segment of the population turns to Pediatricians for their TB treatment. This operational research was done to assess the Knowledge, Attitude and

Practice of Pediatricians regarding TB case management in five major cities of Punjab, India.

## METHODS

It is an observational cross- sectional study. Target population were pediatricians of five major cities of Punjab. The present study was conducted over period of one year from January 2017 to January 2018. The study was carried out in five major cities of Punjab i.e. Ludhiana, Jalandhar, Amritsar, Patiala and Bathinda,

which inhabit nearly half of the urban population of Punjab. Pediatricians registered with Indian Academy of Pediatrics (IAP) in the listed five districts of Punjab was obtained from IAP office bearers. Pediatricians were randomly selected by computer generated randomization method to include at least 50% of members from each of the five districts.

### Data collection

The Pediatricians were told the nature and purpose of the study and a written consent was taken. The data collection was done using a structured questionnaire containing information about age, sex, professional qualification, experience of Pediatricians and their knowledge of TB Disease, Case suspicion, Diagnosis and Treatment. The second part included their information of DOTS centre, DOTS treatment, Case Notification and Barriers in notification, and reasons for Non-referral.

Adequate Knowledge was considered when at least 50% of responses were correct regarding TB Case Suspicion and TB Treatment (i.e. 2 out of 4 responses) and TB Diagnosis (i.e. 3 out of 6 responses). DOTS centre was considered to be accessible if travel distance by road was less than 2.5 Km. For the study, Pediatricians were also divided into two groups, Referral group and Non-referral group. Referral group involved Pediatricians who had referred at least one TB patient during last two quarters to the nearest DOTS centre for treatment. Non-Referral group included Pediatricians who did not refer any patient during the study period.

The Operational Research (OR) Project was approval by Institutional Ethics Committee and Operational Research committee of the State Task Force-RNTCP (Punjab). The

study was registered with Clinical Trials Registry - India (CTRI).

### Sample size

With confidence level of 95%, power of 80%, difference of proportion of adequate knowledge of TB between referral and non-referral to be 20% (from pilot study), sample size was calculated to be 95. To compensate for non-response and incomplete data, minimum sample size calculated was 105. Representation from each district was ensured by including at least 50% Pediatricians from each district.

### Data analysis

The data so generated were entered by data entry operator and further analyzed using Statistical Package for Social Sciences (SPSS package), version 21 (IBM SPSS statistics 20.0.0, 2011). Chi-square test and p value was estimated for each variable and value  $<0.05$  was considered to be significant.

## RESULTS

A total of 139 pediatricians from 5 major cities of Punjab participated in the study (Ludhiana: 45, Jalandhar: 32, Amritsar: 28, Patiala: 22, Bathinda: 12). Of the Paediatricians, 69% were male. A quarter doctors (24%) had diploma qualification and rest had MD/DNB degree. Mean age of pediatricians was  $44 \pm 7.4$  years (range: 27-63) and mean experience was  $11.5 \pm 5.6$  years (range: 1- 28).

Pediatrician age, gender, qualification and years for experience had no influence on referral of TB cases to DOTS centre (Table 1).

**Table 1: Characteristics of paediatricians from 5 major districts of Punjab.**

		Non-referral (n=50)		Referral (n=89)		Total (n=139)		Chi-square value	p-value
Age group	$\leq 40$ yrs	20	34.5%	38	65.5%	58	41.7%	0.096	0.757
	$> 40$ yrs	30	37.0%	51	63.0%	81	58.3%		
Sex	F	15	34.9%	28	65.1%	43	30.9%	0.032	0.858
	M	35	36.5%	61	63.5%	96	69.1%		
Qualification	Diploma	12	42.9%	16	57.1%	28	20.1%	2.833	0.243
	Diplomate national board	0	0.0%	4	100.0%	4	2.9%		
	MD	38	35.5%	69	64.5%	107	77.0%		
Experience	$\leq 10$ yrs	24	36.4%	42	63.6%	66	47.5%	0.008	0.927
	$> 10$ yrs	26	35.6%	47	64.4%	73	52.5%		
District	Amritsar	2	7.1%	26	92.9%	28	20.1%	26.078	<0.001*
	Bathinda	0	0.0%	12	100.0%	12	8.6%		
	Jalandhar	19	59.4%	13	40.6%	32	23.0%		
	Ludhiana	19	42.2%	26	57.8%	45	32.4%		
	Patiala	10	45.5%	12	54.5%	22	15.8%		
Total		50	40.4%	89	59.6%	139	100%		

\* p value  $<0.05$  is significant

**Table 2: Knowledge of TB case suspicion, diagnosis and treatment and referral pattern.**

	Non-referral (n=50)	Referral (n=89)		Total (n=139)		Chi-square value	p-value	Odds ratio	95% confidence interval		
		Referral (n=89)	Total (n=139)						Lower	Upper	
<b>Tb case suspicion knowledge</b>											
When to suspect pediatric TB	48	35.3%	88	64.7%	136	97.8%	1.254	0.263	3.667	0.324	41.486
Commonest form of extrapulmonary TB (In TB)	33	32.4%	69	67.6%	102	73.4%	2.178	0.140	0.178	0.824	3.832
Duration of contact required in pulmonary TB (2 yrs)	32	36.0%	57	64.0%	89	64.0%	0.000	0.996	1.002	0.487	2.062
Modes of transmission in neonates (except breast feeding)	33	35.5%	60	64.5%	93	66.9%	0.029	0.865	1.066	0.512	2.221
Adequate knowledge	49	35.5%	89	64.5%	138	99.3%	1.793	0.181			
<b>Tb diagnosis knowledge</b>											
Gastric lavage used in pediatric pulmonary tb	44	34.6%	83	65.4%	127	91.4%	1.122	0.289	1.886	0.574	6.195
Sputum induction to get sputum sample	28	38.4%	45	61.6%	73	52.5%	0.380	0.538	0.804	0.401	1.612
Investigations done from sputum sample (smear, CBNAAT, culture)	40	34.8%	75	65.2%	115	82.7%	0.409	0.523	1.339	0.546	3.286
Different method for diagnosis of TB	48	36.1%	85	63.9%	133	95.7%	0.019	0.891	0.885	0.156	5.014
Strength of tuberculin unit recommended (2 TU)	12	52.2%	11	47.8%	23	16.5%	3.141	0.076	0.447	0.181	1.104
First action in pediatric In TB algorithm (course of antibiotic	17	30.9%	38	69.1%	55	39.6%	1.013	0.314	1.446	0.704	2.987
Adequate knowledge	46	38.0%	75	62.0%	121	87.1%	1.697	0.193	0.466	0.145	1.501
<b>TB treatment knowledge</b>											
Pediatric patient wise boxes in different age group	10	38.5%	16	61.5%	26	18.7%	0.086	0.769	0.877	0.364	2.112
Pediatric patient wise boxes applicable till 30 kg	8	18.6%	35	81.4%	43	30.9%	8.153	0.004*	3.403	1.429	8.102
Knowledge of lag period in alternate day therapy	7	20.0%	28	80.0%	35	25.2%	5.181	0.023*	2.820	1.129	7.044
Three drugs in continuation phase	9	31.0%	20	69.0%	29	20.9%	0.388	0.533	1.320	0.550	3.172
Adequate knowledge	5	17.9%	23	82.1%	28	20.1%	4.995	0.025*	3.136	1.110	8.862

\* p value <0.05 is significant

### **TB disease and case suspicion knowledge**

Of the doctors, 99% had adequate knowledge of TB disease and case suspicion. Majority of doctors had knowledge of when to suspect pediatric TB. Commonest form of extrapulmonary TB as lymph node TB was known to 74% doctors. Different modes of transmission to Neonates (not through breast feeding) was known to 67% pediatricians.

### **TB diagnosis knowledge**

Adequate knowledge of TB diagnosis was seen in 87% pediatricians. The use of CBNAAT from different

samples was known to 82% doctors. Utility of gastric lavage and different methods of diagnosis of TB was known to 90% pediatricians. Sputum induction to get sputum sample was known to 53% doctors. Correct strength of Tuberculin units (2U) was known only to 17% doctors. The correct algorithm approach of Lymph node TB (giving course of antibiotics, before FNAC) was known to 40% doctors.

### **TB treatment knowledge**

Only 20% doctors had adequate knowledge regarding treatment of TB cases. Three drugs in the continuation phase of Category I therapy was known to only 21%

doctors. Correct pediatric weight-band wise boxes were known to 19% pediatricians. The concept of lag period as basis of alternate day therapy was known to only 26%.

### Knowledge about TB notification

Majority of the Pediatricians knew the need to notify TB cases to the authorities (91%), only few knew which year

it started. The common concerns were lack of self-motivation (31%) and unclear method of notification (30%). There was significant difference between referral and non-referral group regarding knowledge of TB notification (67% vs 34%) (p value=0.044).

**Table 3: Knowledge of DOTS, dots centre and TB case notification and referral pattern.**

	Non-referral (n=50)	Referral (n=89)		Total (n=139)		Chi-square value	p-value	Odds ratio	95% confidence interval	
									Lower	Upper
<b>Knowledge about dots/ RNTCP</b>										
Knows dots center	43	33.9%	84	66.1%	127	91.4%	2.852	0.091	2.735	0.820
Dots centre accessible	43	33.3%	86	66.7%	129	92.8%	5.417	0.020*	4.667	1.149
Fear of losing patient	12	70.6%	5	29.4%	17	12.2%	10.077	0.002*	0.188	0.062
Bad experience at dots center	15	46.9%	17	53.1%	32	23.0%	2.146	0.143	0.551	0.247
Faith in govt. Sector	22	22.9%	74	77.1%	96	69.1%	22.962	<0.001*	6.279	2.857
Any contact with RNTCP	15	27.8%	39	72.2%	54	38.8%	2.574	0.109	1.820	0.872
Intermittent therapy effective	26	39.4%	40	60.6%	66	47.5%	0.639	0.424	0.754	0.376
Fear of quality of medicines	27	65.9%	14	34.1%	41	29.5%	22.546	<0.001*	0.159	0.072
<b>Knowledge about notification</b>										
Know year of notification	6	40.0%	9	60.0%	15	10.8%	0.118	0.731	0.825	0.276
Need to notify tb cases	42	33.3%	84	66.7%	126	90.6%	4.070	0.044*	3.200	0.986
<b>Barriers for tb case notification</b>										
1. Lack of self-motivation	14	33.3%	28	66.7%	42	30.2%	0.182	0.670	1.180	0.551
2. Loss of confidentiality	6	30.0%	14	70.0%	20	14.4%	0.362	0.548	1.369	0.491
3. Fear of losing the patient	6	46.2%	7	53.8%	13	9.4%	0.646	0.422	0.626	0.198
4. Not knowing whom to notify	17	41.5%	24	58.5%	41	29.5%	0.762	0.383	0.717	0.339

\* p value <0.05 is significant

### Concerns of pediatricians

Some Pediatricians had apprehension of losing the patient (13%) and had doubt regarding quality of medicines available in DOTS centre (30%). Some had a previous bad experience regarding DOTS centre (23%). Sensitization from the RNTCP about TB control programme for pediatricians was lacking (35%). In spite of the concerns, 69% doctors had faith in the government sector for treatment of TB cases.

### DOTS centre referral

Overall 64% of Pediatricians referred TB cases to DOTS centre for treatment. Although 92% of doctors knew location of DOTS centre and it was accessible for 93%

doctors, one third doctors did not refer TB cases to DOTS centre.

There was no significant difference between referral and non-referral group regarding knowledge of TB disease and case suspicion (65% vs 36%) (p value=0.181) and also of knowledge of TB diagnosis (62% vs 38%) (p value=0.193). There was significant difference between referral and non-referral group regarding knowledge of TB treatment (82% vs 18%) (p value=0.025) (Table 2).

Comparing the two groups, fear of losing patient was significantly more in non-referral group (71%) compared to referral group (30%) (p value=0.002). Also, apprehension about quality of drugs was much more in non-referral group (66%) compared to referral group (34%) (p value <0.001). Faith in government sector was

very strong in referral group (77%) compared to non-referral group (23%) (p value<0.001) (Table 3).

## DISCUSSION

In the study, although knowledge of TB Disease and TB Diagnosis was more than 90%, only 20% doctors had adequate knowledge regarding TB Treatment. Fear of losing patients and apprehension about quality of drugs available in the DOTS centre were significantly factors hindering referral of cases. This knowledge gap was significantly more in Pediatricians non-referring cases to DOTS centre (p value=0.025).

All over India, treatment practices of TB cases are quite varied.<sup>2,3</sup> A recent study done in the slums of Mumbai showed, only 6 of the 106 private doctors respondents wrote a correct drug regimen. Further, 106 doctors prescribed 63 different drug regimens.<sup>4</sup> A study in low- and middle-income areas of Delhi showed only 21% patients were correctly managed by the private providers.<sup>5</sup> General Practitioners in Kolkata regarding RNTCP and DOTS showed good knowledge and proper practice only in 24 and 19.7% of the practitioners, respectively. About 68% of the practitioners sent TB patients to private laboratories for diagnosis, while only 31% sent to the government ones.<sup>6</sup>

In the study, there was significant difference between referral and non-referral group regarding knowledge of TB treatment. This knowledge gap can be effectively improved by sensitizing pediatricians through workshops and by attending CMEs conducted by RNTCP. It was noted only 38% doctors were sensitization from the RNTCP program (in any form). An Interventional study conducted in Rahata Taluka of District Ahmednagar, showed significant improvement in diagnosis and treatment by giving personal visits by RNTCP programme to Private Medical Practitioners.<sup>7</sup>

Although in the study, majority of the pediatricians from 5 districts knew the need to notify patients, annual national report on TB 2016 shows none of the states throughout the country having proportion of notification > 30%, with notification from private sector in Punjab to be <10%.<sup>1,3</sup> The paradox here referred as “perception-practice gap” highlights that due to under-reporting by the private sector, many cases of TB might be missing by the notification system.<sup>8,9</sup> Thus, there remains a lot to be worked on to improve notifications from private providers, which is being done in recent times.

In 2014, global reporting system created by WHO measured a marked increase in global TB notifications. The annual total of new TB cases increased globally to 6%, mostly due to a 29% increase in TB notifications in India.<sup>10,11</sup> To promote TB case notification, incentives are provided upon notification in the TB reporting software i.e. Nikshay through a smooth and programme integrated direct beneficiary transfer.

Recently RNTCP has deployed the CB NAAT (Cartridges Based Nucleic Acid Amplification Test) machines across the country for diagnosis of TB cases. CB NAAT is a rapid molecular assay that detects M. tuberculosis and Rifampicin resistance and provides results within two hours.<sup>12</sup> Currently, CBNAAT is used for diagnosis of Pediatric TB, extra-pulmonary TB, smear negative pulmonary TB, HIV-TB patients as well as diagnosis of drug resistant. In the study, 80% of Pediatricians were aware of use of CB NAAT for diagnosis of TB from different body fluids and also from gastric aspirate sample. These strategies have improved TB case detection in children.

To authors knowledge this is the first study to assess the knowledge, attitude, treatment practices and referral pattern of Pediatricians in an Indian state. Improving the knowledge of pediatricians by regular sensitizing them will go a long way in improving the coverage of TB treatment.

## CONCLUSION

Although 90% doctors had adequate knowledge of TB Disease and Diagnosis, only 20% doctors had adequate knowledge regarding TB treatment. Overall 64% of Practicing Paediatricians referred TB cases to DOTS centre for treatment. This knowledge-gap was significant more in non-referral doctors. Improving the knowledge of TB treatment of paediatricians by regular sensitizing them regarding TB management will go a long way in improving management of TB treatment.

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