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Evaluation of Knowledge of MDR-TB among Medicine Training Doctors in Tertiary Care Hospital, Karachi, Pakistan

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Authors' contributions

This work was carried out in collaboration between both authors. Author AS designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors AS and ANJ managed the analyses of the study. Author ANJ managed the literature searches. Both authors read and approved the final manuscript.

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ABSTRACT

Tuberculosis is the oldest documented infectious diseases in humans and they still cause significant morbidity and mortality. Multi-Drug Resistant Tuberculosis (MDR-TB) is a growing hazard to human health worldwide and threat to control of tuberculosis. WHO estimates 3.2% incidence of MDR TB in new cases. MDR-TB new cases are created each year by a combination of poor patient compliance with treatment and physician error. The purpose of the study is to determine the status of knowledge and awareness amongst the medicine resident about the very basic knowledge of MDR-TB and need to strengthen teaching about tuberculosis to postgraduates so the objective of the study is to determine the frequency of knowledge of MDR –TB among medicine residents (postgraduate trainees) at a tertiary health care hospital Karachi. It is a descriptive based cross sectional study. 58 post graduates trainees were included. A simple questionnaire about MDR-TB was asked to fill in 30 minutes, each correct response will be given 10 marks and those who score 70% will be labeled as knowledgeable. The primary outcome measure was the frequency of knowledge of MDR –TB among medicine residents (postgraduate trainees) at a tertiary health care which turned out to be 65.5% knowledge among postgraduate

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trainees. So we concluded that there is a need of further studies with larger sample size and follow up studies after educating the trainees more of senior levels so that identification of predictors of mortality, so as to timely diagnose, intervene and hence prevent morbidity and fatalities. It is, therefore, important to develop continuous health education to improve TB knowledge and awareness at different levels.

Keywords: MDR-TB; medicine training doctors; human health worldwide; tuberculosis.

1. INTRODUCTION

Tuberculosis is the oldest documented infectious diseases in humans [1,2] and they still cause significant morbidity and mortality. The goal of anti-TB therapy is cure. There are two types of anti-TB therapy: definitive TB therapy for drug-susceptible infection, and therapy for drug-resistant TB [3,4].

Multi-Drug Resistant Tuberculosis (MDR-TB) is a growing hazard to human health worldwide and threat to control of tuberculosis. Pakistan ranks eighth on the list of 22 Global high burden countries while it has the largest registered population of MDR TB cases in the EMRO region (eastern Mediterranean region). China and India carry approximately 50% of the global burden of MDR TB WHO estimates, incidence of MDR TB in new cases is 3.2% while in treated cases and it is 35% in Pakistan [5,6]. In a study organized by the Pakistan Chest Society showed that MDR TB at 1.8% in new cases [7]. Other new cases of MDR-TB are created each year by a combination poor patient compliance with treatment and physician error [8].

Few attempts on how to measure physician tuberculosis knowledge and understanding of national TB guidelines in TB incidence countries [9,10] including Pakistan [11,12,13] but the recent knowledge of XDR-TB existence and as MDR-TB cases increasing, the knowledge and handling of TB treatment is still seems insufficient. Study done in Pakistan regarding "Status of health professional awareness about resistance tuberculosis "showed that among health professional's knowledge of MDR TB and XDR TB on the basis of experience and postgraduate qualifications was inadequate in all categories. So it was concluded that major gaps of knowledge are there, regarding DR -TB in health care providers and there is urgent need to address this issue. While Multi Drug Resistance Tuberculosis continue to gain momentum in Pakistan, diagnosis and a proper prescription written by a practicing physician should be adequate and is as important as treatment compliance by the patient, so that emergence of drug resistant tuberculosis should be controlled off.

The purpose of the study is to determine the status of knowledge and awareness amongst the medicine training residents about the very basic knowledge of MDR-TB and need to strengthen teaching about tuberculosis to postgraduates. As no such study has been done so far at the trainee level of health practitioners, the information will help in better understanding the present contribution of trainee doctors in T.B control and identify ways to involve them in the implementation of TB control programs in future. If residents are well aware of the diagnostic criteria of MDR-TB, it would implicate that they are well equipped to refer such patients to specialist chest physician. On the other hand if they are not aware about the diagnostic criteria then they need to be educated more on this.

1.1 Objective

To determine the frequency of knowledge of MDR –TB among medicine residents (postgraduate trainees) at a tertiary health care hospital Karachi.

1.2 Operational Definition

KNOWLEDGE of MDR-TB is based on that "Those residents who score > 70% in questionnaire will be deemed as knowledgeable."

2. METHODOLOGY

2.1 Study Design

Descriptive Cross-sectional study

2.2 Setting

Department of Medicine, Aga Khan University Hospital (AKUH), Karachi, Pakistan.

2.3 Sample Size

From the literature, status of knowledge of definition regarding the drug resistance in Tuberculosis in health care providers was 40%, with a bound on error of 13%, a sample of at least 55 will be required. However, there are only 58 training residents, So all internal medicine postgraduate trainees (58) will be included.

2.4 Sampling Technique

non probability consecutive sampling

2.5 Sample Selection

Inclusion criteria

- All internal medicine residents (year I, II, III, IV) working currently in Aga khan university and hospital.
- Resident Year 1 (those who completed 6 months training period).

Exclusion criteria:

- Responses not given spontaneously or with discussion would be excluded.
- Incomplete responses would also be excluded.

2.6 Data Collection

A simple questionnaire (proforma) was designed which is based on basic knowledge of MDR-Tb(definition, sign and symptoms, duration of treatment etc) and was presented to the medicine residents to respond by spontaneous answers to questions in the questionnaire. The participants were asked few questions regarding Multi Drug Resistant Tuberculosis (MDR TB).Thirty minutes time was given, each correct response was given 10 marks so out of 10 questions in a questionnaire, those who scored 70% was labeled as knowledgeable. They were not allowed to have discussion while filling the questionnaire.

2.7 Statistical Analysis

All analyses were conducted by using the Statistical package for social science SPSS (Release 17.0, standard version, copyright © SPSS; 1989-02). Mean and standard deviation would be calculated for quantitative variables i.e. physician age. Frequency and percentage were calculated for qualitative variables i.e. residency level, year after graduation (<3 years,>3 years), gender and knowledge. Stratification of age, level of resident, years after graduation (experience=<3years, <3years) and gender were done to control effect modifier to observe an outcome, applying chi square, p value < 0.05 will be consider significance.

3. RESULTS

Total 58 residents from department of medicine of Aga Khan University Hospital were included in the study. Performa of all included residents were reviewed at the end of session.70% marks holder residents were labeled as knowledgeable. All analysis was conducted by using SPSS (release 17, standard version, copyright © SPSS; 1989-02). The detailed results are given below.

Mean age of the residents was 27.98 (range from 25 to 31) while the clinical experience according to years of graduation was 3.37. The overall mean of the marks obtained by the residents according to their filled questionnaires was 71.38.

The Residents (n=58) were categorized according to the year of their residency training level, gender and knowledgeable. It shows more of residents of year two level n=19(32.8%) then year one n=17(29.3%) year four n=12(20.7%) and then year three level n=10(17.2%) while more male residents as compare to female residents n=35(60.3%) in the training and 38(65.5%) residents out of 58 residents are found to be more knowledgeable (who gained 70% marks). It shows residents with experience of less than 3 years are more in no. (n=33, %=56.9) as compare to residents experienced more than 3 years (n=25, %=43.1). Residents are divided into two according to age groups. Those who are in group (25-28 years) are more in no. (n=37, %=63.8) as compare to those who are in group (29-31years) (n=21, %=36.2).

3.1 Stratification of Knowledge

The main variable of our study i.e. knowledge was assessed further according to the level of residency, age groups, years of experience and gender. Data was stratified in order to avoid confounding effects and chi-square test was applied. P value of 0.05 was considered significant.

Table 1. Baseline characteristics of the study group (n=58)

Parameters	Frequency (n)	Percentages (%)
Residency Level		
R1	17	29.3
R2	19	32.8
R3	10	17.2
R4	12	20.7
Gender		
Male	35	60.3
Female	23	39.7
Knowledge		
Less Knowledgeable	20	34.5
More Knowledgeable	38	65.5
Experience in years		
Less than 3 years	33	56.9
More than 3 years	25	43.1
Age groups		
25-28 years	37	63.8
29-31 years	21	36.2

Table 2. Stratification of knowledge (according to level of residency)

			Knowledge		
			Less knowledgeable	**knowledgeable**	**P value**
Residency level	R1	Count	7	10	0.53
		% knowledgeable	35.0%	26.3%	
	R2	Count	7	12	
		% knowledgeable	35.0%	31.6%	
	R3	Count	4	6	
		%knowledgeable	20.0%	15.8%	
	R4	Count	2	10	
		% knowledgeable	10.0%	26.3%	
Total		Count	20	38	
		% knowledgeable	100.0%	100.0%	

Table 3. Stratification of knowledge (according to age criteria)

			Knowledge		
			less knowledge	**knowledgeable**	**P value**
age	25-28 years	Count	14	23	0.47
		% knowledgeable	70.0%	60.5%	
	29-31 years	Count	6	15	
		% knowledgeable	30.0%	39.5%	
Total		Count	20	38	
		% knowledgeable	100.0%	100.0%	

Different residency levels were assessed individually in terms of knowledge. Though P value was not found to be significant but it can be seen that the knowledge of R2 was higher (31.6%) followed by R1 and R4, who shares same percentage of being knowledgeable (26.3%) and then R3 (15.8%).

Candidates were divided into two age groups (25-28 years and 29-31 years) and their knowledge was assessed. Interestingly, the clinicians in lesser age group were found more knowledgeable (60.5%) as compared to other group (39.5%), though P-value was not significant (0.47).

Table 4. Stratification of knowledge (according to experience years)

			knowledgeable		
			less knowledge	knowledgeable	P value
Year	<3years of experience	Count	13	20	0.36
		% knowledgeable	65.0%	526%	
	>3 years	Count	7	18	
		% knowledgeable	35.0%	474%	
Total		Count	20	38	
		% knowledgeable	100.0%	100.0%	

Table 5. Stratification of knowledge (according to gender)

			knowledgeable		
			less knowledge	knowledgeable	P value
Gender	Male	Count	16	19	0.02
		% within knowledgeable	80.0%	50.0%	
	Female	Count	4	19	
		% within knowledgeable	20.0%	50.%	
Total		Count	20	38	
		% within knowledgeable	100.0%	100.0%	

Further, clinical experiences of the residents were grouped as less than 3 years and more than 3 years and their knowledge assessment according to that were done which showed around 5% more knowledge in the residents who had less than 3years of working experience (52.6%) while on the other hand it was 47.4% but P-value was not significant (0.36).

Knowledge is further checked on the basis of gender and the results showed that males and females were equally knowledgeable (50%) but there were more number of males who were in less knowledgeable category (80%) as compared to females (20%) and P-value was found to be significant (0.02).

4. DISCUSSION

This study was performed in Aga Khan University Hospital. It was a questionnaire based study. The data was entered twice to ensure avoidance of errors. Analysis was done through SPSS. WHO report suggests that globally 3% of M. tuberculosis isolates are MDR-TB [14] resistance to TB drugs is recognized in Pakistan [15,16] While community based information is lacking, laboratory data suggests an increasing frequency of MDR from 14% in 1999 to 28% in 2004 and 47% in 2006 [17]. Aga Khan University (hand out teams) –January to July 2007 tested 1240 strains out of which 410 were declared MDR TB. Alarming the response to this threat of MDR TB by government and the medical community is far from satisfactory. WHO mission for need assessment in provinces of Sind and Punjab highlighted major deficiencies. One of the areas highlighted was poor human resource availability, its distribution, training and advocacy. Lack of active and effective advocacy initiative in this field is another factor leading to poor Tuberculosis control. The review of under graduate and post graduate syllabi of Pakistan Medical Dental Council and College of Physicians and Surgeons of Pakistan shows an outdated rather redundant curriculum of training [18].

This study involved a tertiary care teaching hospital in which post graduate medical trainees were surveyed regarding the level of basic knowledge about MDR tuberculosis. High level of tuberculosis (TB) knowledge among physicians is important in order to achieve high case-finding and efficient case-management. Few attempts on how to measure physicians' TB knowledge and understanding of national TB guidelines in middle-TB incidence countries such as Croatia have been reported. Related surveys were carried out mostly in high or low incidence countries. The aim of this study was to investigate TB knowledge among general practitioners (GPs) and pediatricians. Median percentage of correct responses was not low (70.3%) [19]. Similar in our survey, though no. trainee were less (n=58) but the estimated knowledge was 65.5%.While 60.3 %(n=35) were male and 39.7 %(n=23) were female and

more residents were of year one level. Although the mean marks obtained by the trainee was above 70%, in which male and female were about the same knowledge level, but several areas of concern were revealed. Knowledge of junior residents (year 2 and then year 1) were found to be more (31.6%, 26.3% respectively) as compare to senior residents (R3=15.8%, R4=26.3).which could be the discrepancy of small sample size and probably the pulmonology rotation provided during year 1 and year 2 level. While similarly the trainee of less experience (<,=3 years of experience=52.6% and age(25-28 years=60.5%) were more knowledgeable which is similar to the study done in Rawalpindi, Pakistan by Wajid et al, Status of health professionals' awareness about resistant tuberculosis, in which less than 5 years of experienced postgraduates had 58.3% while more than this was 47.05%.Junior specialist seemed more informed than the two senior groups, which is quite similar with our study.

In a study from Pakistan, poor recognition of the burden of tuberculosis and its public health significance was equally identified among medical interns. Study done by Akhtar T, Management of TB by practitioners of Peshawar showed similar results [20], lacking knowledge, which quite opposite from our study. Of 460 interns from five teaching hospitals surveyed, only 22% correctly identified the estimated number of new TB cases in Pakistan [21], which is opposite from our study.

Several possible limitations of this study should be noted. First, in any survey using a questionnaire, the problem of non-response must be considered. Non-responders may have had different level of TB knowledge and practice. There is a need of further studies with larger sample size and follow up studies after educating the trainees more of senior levels so that identification of predictors of mortality so as to timely diagnose, intervene and hence prevent morbidity and fatalities. It is, therefore, important to develop continuous health education to improve TB knowledge and awareness at different levels.

5. CONCLUSION

The frequency of knowledge of MDR-TB is 65.5% among medicine residents at tertiary health care in Karachi. It is also found in subset analysis of seniority and experience amongst residency level, did not reveal a significant difference although junior specialist seemed more informed than the two senior groups.

CONSENT AND ETHICAL APPROVAL

All Internal medicine residents at Aga Khan University Hospital fulfilling inclusion criteria were included after taking informed consent as research ethic. They were required to give basic information about their age, gender, training and seniority; name was taken as optional as research ethic confidentiality. Ethics approved by Ethical review committee of the university.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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