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

Afifa Saulat1* and Anwar Nabeel Jafri1

1Department of Internal Medicine, Aga Khan University and Hospital, Karachi, Pakistan.

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
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=<3 years, ≥3 years) 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 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(699,650),(746,666)% 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 (29-31 years) (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                | Count               |               |         |
| R1                              | 7                   | 10            | 0.53    |
| % knowledgeable                | 35.0%               | 26.3%         |         |
| R2                              | 7                   | 12            |         |
| % knowledgeable                | 35.0%               | 31.6%         |         |
| R3                              | 4                   | 6             |         |
| % knowledgeable                | 20.0%               | 15.8%         |         |
| R4                              | 2                   | 10            |         |
| % knowledgeable                | 10.0%               | 26.3%         |         |
| Total                           | 20                  | 38            |         |
| % knowledgeable                | 100.0%              | 100.0%        |         |

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

| Knowledge                       | less knowledge | knowledgeable | P value |
|---------------------------------|----------------|---------------|---------|
| age                             | Count          |               |         |
| 25-28 years                     | 14             | 23            | 0.47    |
| % knowledgeable                | 70.0%          | 60.5%         |         |
| 29-31 years                     | 6              | 15            |         |
| % knowledgeable                | 30.0%          | 39.5%         |         |
| Total                           | 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 share 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)

| Year        | Count | % knowledgeable | Knowledgeable | % knowledge | P value |
|-------------|-------|------------------|---------------|-------------|---------|
| <3 years    | 13    | 65.0%            | 20            | 526%        | 0.36    |
| >3 years    | 7     | 35.0%            | 18            | 474%        |         |
| Total       | 20    | 100.0%           | 38            | 100.0%      |         |

Table 5. Stratification of knowledge (according to gender)

| Gender | Count | % within knowledgeable | Knowledgeable | % knowledge | P value |
|--------|-------|-------------------------|---------------|-------------|---------|
| Male   | 16    | 80.0%                   | 19            | 50.0%       | 0.02    |
| Female | 4     | 20.0%                   | 19            | 50.0%       |         |
| Total  | 20    | 100.0%                  | 38            | 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 3 years 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...
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.

REFERENCES

1. Daniel TM. The origins and precolonial epidemiology of tuberculosis in the Americas: can we figure them out? Int J Tuberc Lung Dis. 2000;4(5):395–400.
2. Zimmerman MR, Bull NY. Pulmonary and osseous tuberculosis in an Egyptian mummy. Acad Med. 1979;55(6):604–608.
3. World Health Organization. WHO tuberculosis programme: Framework for effective tuberculosis control. WHO/TB. 1994;94:179.
4. World Health Organization. Global tuberculosis report 2014. WHO/HTM/TB2014.08. Geneva, World Health Organization; 2014.
5. Wajid AN, Arshad.H, Mohammad N Fehmida. Status of health professionals’ awareness about resistant tuberculosis. Pak Chest Med. 2010;16(1):4-8.
6. National guidelines for management of DR tuberculosis, Ministry of Health, Government of Pakistan; 2009.
7. Javaid A, Hasan R, Ghafoor A, Pathan AJ, Rab A, Sadiq A. Prevalence of primary multidrug resistance to ATT in Pakistan. Int J Tuberc Lung Dis. 2008;12(3):326-31.
8. Arif K, Ali SA, Amanullah S. Physician compliance with national tuberculosis treatment guidelines: A university hospital study. Int J Tuberc Lung Dis.1998;2:225-30.
9. Hong Y P, Known D W, Kim S J, et al. Survey of knowledge, attitudes, and practices for tuberculosis among general practitioners. Tubercle Lung Dis. 1995;76: 431–435.
10. Busari A Adeyemi, O Busari: Knowledge of tuberculosis and its management practices among medical interns in a resource-poor setting: implications for disease control in sub-Saharan Africa. The Internet Journal of Infectious Diseases. 2008;6(2).

11. Javaid A, Hasan R, Ghafoor A, Pathan AJ, Rab A, Sadiq A. Prevalence of primary multidrug resistance to ATT in Pakistan. Int J Tuberc Lung Dis. 2008;12(3):326-31.

12. Marsh D, Hashim R, Hassany F, Hussain N, Iqbal Z, Irfanullah A, et al. Front-line management of pulmonary tuberculosis: an analysis of tuberculosis and treatment practices in urban Sindh, Pakistan. Tuberc Lung Dis. 1996;77:86-92.

13. Arif K, Ali SA, Amanullah S. Physician compliance with national tuberculosis treatment guidelines: a university hospital study. Int J Tuberc Lung Dis. 1998;2:225-30.

14. WHO: Guidelines for the programmatic management of drug-resistant tuberculosis; 2007.

15. Butt T, Ahmad RN, Kazmi SY, Rafi N. Multi-drug resistant tuberculosis in Northern Pakistan. J Pak Med Assoc. 2004;54(9):469-472.

16. Karamat KA, Rafi S, Abbasi SA. Drug resistance in Mycobacterium tuberculosis: A four years experience. J Pak Med Assoc. 1999;49(11):262-265.

17. Irfan S, Hassan Q, Hasan R. Assessment of resistance in multi drug resistant tuberculosis patients. J Pak Med Assoc. 2006;56(9):397-400.

18. Arsaalan Javaeed. General needs assessment of the undergraduate medical students to integrate courses on medical ethics, time management and communication skills into the bachelor of medicine, bachelor of surgery curriculum of Pakistani medical colleges. Cureus. 2019;11(4):e4433.

19. Jurcev Savicević A. Gaps in tuberculosis knowledge among primary health care physicians in Croatia: Epidemiological study. Coll Antropol. 2009;33(2):481-6.

20. Akhtar T, Imran M. Management of TB by practitioners of Peshawar. J Pak Med Assoc. 1994;44:280-2.

21. Khan JA, Zahid S, Khan R, Hussain SF, Rizvi N, Rab A, et al. Medical interns knowledge of TB in Pakistan. Trop Doct. 2005;35:144-7.