Knowledge and practices of health practitioners toward pulmonary tuberculosis in Saudi Arabia

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Abstract

Background: Appropriate TB knowledge and good practice attitudes are substantial particularly among health care personnel because of great occupational risks during their daily activities. Therefore, TB prevention and control have become an important issue on training courses. This study mainly aimed to assess the level knowledge and practices of health practitioners toward pulmonary tuberculosis in Saudi Arabia. In addition we aim to assess the perception of health practitioners toward the role of CXR.

Methodology: This is a cross-sectional online questionnaire-based study conducted in Al-imam medical clinics Saudi Arabia during 2022.

Results: A total of 95 participants responded to our survey. Almost two thirds of the sample were general practitioners (n = 67, 70.5%). A total of 27 physicians (28.4%) reported seeing a positive result of pulmonary tuberculosis and 43 participants (45.3%) agreed on doing CXR with/without Microbiologic testing to investigate a suspected pulmonary TB patient. Almost half of the participants (n = 47, 49.5%) reported referring to isolation as the next step for positive cases.

Conclusion: Generally speaking, there was a good understanding of TB and clinical knowledge among medical students and physicians which is particularly important for early detection, management and protective measures. Our results showed moderate knowledge regarding TB investigations and excellent knowledge in terms of dealing with positive or suspected cases.

Key words: pulmonary tuberculosis, health practitioners, Saudi Arabia

Introduction

TB (caused by Mycobacterium tuberculosis) is considered to be the ninth leading cause of death worldwide. As per the World Health Organization (WHO), 10.4 million cases were detected in 2016, and 1.4 million deaths were reported to be caused by TB in 2020 (1-2). Tuberculosis is not an area of concern for an individual but for national public health it is devastating and contagious. It is communicable disease caused by a special type of bacteria known as Mycobacterium tuberculosis, which cannot be detected by the formal gram staining method. The disease predominantly affects the lungs of an individual (90% of the cases), but it can also affect many different organs of the body (1). Multiple screening methods are now available to detect Mycobacteria, among which the most common is Chest X-ray, a relevant and rapid method to detect pulmonary changes in pulmonary TB (3). The best cost-effective, compliant, and easy method is CXR, but still, it has been discouraged for TB diagnosis due to its limitations of not being capable of diagnosing smear-negative TB (4). TB has contributed to a significant disease burden and economic loss worldwide. Early identification of TB infection has been challenging. This study aimed to assess the level of knowledge and practices of health practitioners toward pulmonary tuberculosis in Saudi Arabia, in addition to assessing the perception of health practitioners toward of role of CXR.

Methodology

This was a cross-sectional online questionnaire-based study conducted in Al-imam medical clinics Saudi Arabia during 2022. After obtaining ethical approval from Imam medical center, Imam Mohammad Ibn Saud Islamic University No. 292/2022. The self-administered questionnaire was distributed randomly among medical physicians in different specialties, intern doctors, and medical students. The questionnaire was designed to assess knowledge and practices of medical practitioners toward pulmonary tuberculosis. Additional questions related to the role of CXR were added to the survey. The questionnaire was distributed in the English language. Those who were non-health practitioners were excluded.

Results

Characteristics of responders

A total of 95 participants responded to our survey. Almost two thirds of the sample were general practitioners (n = 67, 70.5%); where 40% of the participants were medical students and 30.5% intern doctors. However, family medicine doctors were the highest from medical specialties with an estimated 6.3% compared to internal medicine (5.3%) and emergency medicine (4.2%). The majority of participants had experience of less than 5 years (n = 79, 83.2), however, 11 participants had experience more than 10 years (11.6%). More than half of the sample reported working in a hospital other than Imam Medical Center (n = 53, 55.8%). (Table 1)

Assessment of clinical knowledge

A total of 27 physicians (28.4%) reported they had seen a positive result of pulmonary tuberculosis. Among them, 22 have seen one to five cases, however, three physicians saw five to ten cases and only two physicians reported seeing more than ten cases. Further, 13 of those who had seen positive cases were general practitioners; either medical students or intern doctor.

Regarding the investigation advised for suspected pulmonary TB patients, 43 participants (45.3%) agreed on CXR with/without Microbiologic testing and 40 participants (42.1%) agreed on Microbiologic testing with/without CXR. More than half of the sample (53.7%) reported microbiologic testing as a confirmatory test for pulmonary TB patients, compared to 33.7% who reported CXR. A total of 12 participants (12.6%) were not sure about the investigation for suspected pulmonary TB and the confirmatory test.

In terms of role of CXR in pulmonary TB cases, most participants (n= 35, 36.8%) agreed on its role as a screening tool to detect active TB, followed by being a faster tool (28.4%) and high availability (22.1%). However, 13 physicians agreed in all items (13.7%) for being available, cheaper, faster and as a screening tool to detect active TB.

A total of 80% of responders reported engaging a radiologist to read the CXR, and 42.2% agreed to use CXR to follow up the patients. Cavitation was the most frequent reported lesion expected to be seen in case of pulmonary TB by CXR reported by the vast majority of participants (n = 81, 85.26%), followed by enlarged hilar lymph node (n = 72, 75.8%), pleural effusion (n = 68, 71.6%) and consolidation (n = 62, 65.3%). However, one participant reported tumor, space occupied lesions as an extra lesion to the abovementioned lesions. (Table 2).

Almost half of the participants (n = 47, 49.5%) reported referring to isolation as the next step for positive cases; 31 participants (32.6%) reported referring to pulmonologist. Meanwhile, 13 participants thought ordering additional investigation and only four suggested medications prescription as a next step. (Figure 1).

Table 1: characteristic of included participants

Items	N	%
Medical specialty		
Emergency medicine	4	4.2
ENT	1	1.1
Family medicine	6	6.3
General surgery	5	5.3
Intern doctor	29	30.5
Internal medicine	5	5.3
Medical student	38	40.0
Neurology	1	1.1
Ob/gyn	1	1.1
Pediatrics	4	4.2
Psychiatry	1	1.1
Years of experience		
5 - 10 years	5	5.3
Less than 5 years	79	83.2
more than 10 years	11	11.6
Have you worked in a hospital other than Imam medical center?		
Yes	53	55.8
No	42	44.2

Figure 1: What is the next step for positive cases?

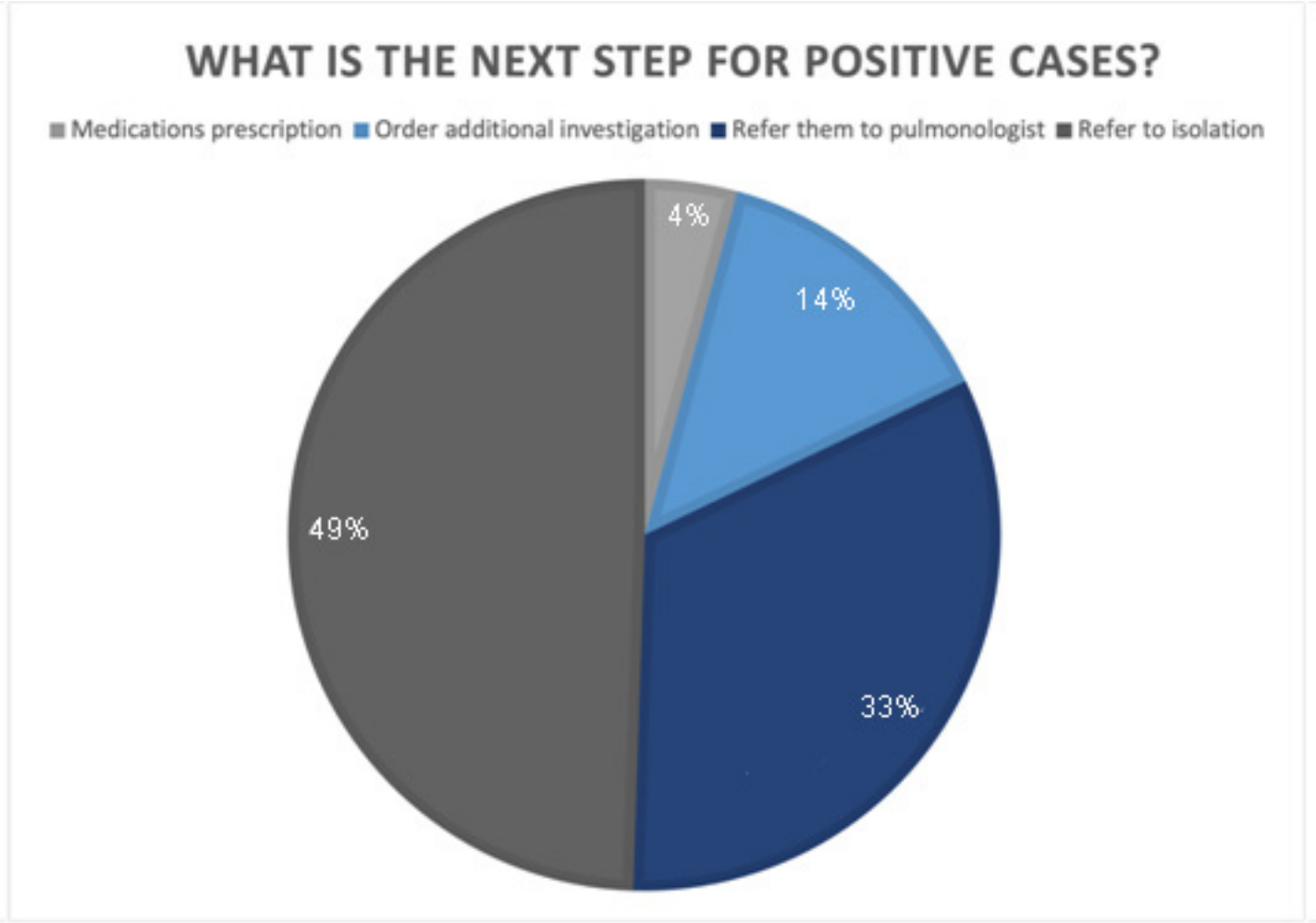

Table 2: The level of knowledge and practices of physicians

Item	N	%
Have you ever seen a positive result of pulmonary tuberculosis?		
No	68	71.6
Yes	27	28.4
Approximately how many cases you ever seen?		
+10 cases	2	2.1
1 - 5 cases	22	23.2
6 - 10 cases	3	3.2
None	68	71.6
Investigation advised for suspected pulmonary TB patient?		
CXR with/without Microbiologic testing	43	45.3
Microbiologic testing with/without CXR	40	42.1
Not sure	12	12.6
Confirmatory test for pulmonary TB patient?		
CXR	32	33.7
Microbiologic testing	51	53.7
Not sure	12	12.6
Role of CXR in pulmonary TB cases?		
Availability	21	22.1
Cheaper	6	6.3
As screening tool to detect active TB	35	36.8
Faster	27	28.4
Not sure	12	12.6
All	13	13.7
What is the next step for positive cases?		
Medications prescription	4	4.2
Order additional investigation	13	13.7
Refer them to pulmonologist	31	32.6
Refer to isolation	47	49.5
Do you engage a radiologist to read the CXR?		
No	19	20.0
Yes	76	80.0
CXR can be used to follow up with patient		
No	34	35.8
Not sure	21	22.1
Yes	40	42.1
What is expected to be seen in case of pulmonary TB by CXR?		
Cavitation	81	85.26
Hilar lymph node	72	75.8
Plural effusion	68	71.6
Consolidation	62	65.3
Tumor, space occupying lesions	1	1.1

Discussion

Appropriate TB knowledge and good practices and attitudes are substantial particularly among health care personnel because of the great occupational risks during daily activities. Therefore, TB prevention and control have become an important issue on training courses [5]. One of the United Nations Millennium Development Goals (MDGs) was to decrease the TB incidence by 2015 and target TB control [6]. Our findings revealed that the percentages of diagnostic knowledge, awareness of radiological findings, and appropriate clinical management of suspected cases were satisfactory among our sample. In our study, approximately 45% of participants had adequate knowledge regarding the investigation advised for suspected cases and about 50% had accurate knowledge regarding the confirmatory test of TB. Our results come higher than percentages found in Bangalore city where adequate knowledge was reported by 30% only [7]. In the USA, a self-reported survey was provided for students in The National Tuberculosis Curriculum Consortium (NTCC) schools prior to the availability of NTCC-developed educational course to evaluate the baseline level of knowledge about TB. Most students thought TB education was important to their academic program and their career path. However, 40% of the respondents reported that they were unconfident about their level of TB knowledge for their career needs [8]. This emphasizes the need to establish effective and sufficient TB educational programs worldwide.

Concerning the appropriate management step after diagnosing TB, in a study done in Japan in 2002 among physicians in 80 medical school hospitals, about 89.3% of doctors believed the necessity of isolation for TB patients and about 70.5% reported offering anti TB drugs for patients with any complications [9]. Conversely, in our study almost half of the participants reported referring to isolation as the immediate next step for positive cases, and only four suggested medications prescription.

In Brazil, a cross-sectional survey was conducted among 1,094 undergraduate medical students in early and late clinical years. Many students did not have sufficient knowledge regarding the main routes of TB infection and protective measures of using face mask during examination of an active TB case [10]. In Italy, the results from a cross-sectional survey among the fifth medical year students (n=183) showed that around half of the sample had correct answers regarding TB knowledge (56.5% ± 11.6%), epidemiology and prevention (63.5% ± 16.3%), diagnosis (54.1% ± 12.4%), and treatment (45.7% ± 20.4%) [11].

According to meta-analysis, PBL in medical education was found to have favorable outcome on student medical knowledge and acquired skills [12]. The majority of our sample were medical students or intern doctors and showed a satisfactory knowledge of TB similar to that found with students in the final or graduation medical year from Canada, India, and Uganda who had significant basic knowledge and practice competency[13]. In this context, Kilicaslan et al. showed that TB related questions in pulmonology exam for undergraduates did not meet the learning objectives by WHO covering only nine objectives [14].

According to the Centers for Disease Control Core Curriculum, all health care professionals should have adequate knowledge of TB burden, screening, prevention, and BCG vaccination [15]. For instance, in a survey conducted among nursing students, average knowledge about the sputum smear examination being diagnostic was 50% [16].

There are other aspects challenging TB knowledge and control issues and it is important to raise the awareness of these obstacles. The social stigma of TB was mainly because of fear of infection, physical frailty, and association with human immunodeficiency virus/acquired immune-deficiency syndrome (HIV/AIDS) [17]. Further, several infection control measures have been recommended to reduce TB transmission including adequate ventilation, triage and isolation of patients with cough which might be unavailable in lesser facilities [18]. The new generation screening tool, QuantiFERON-TB test, has excellent utility and accuracy, especially in BCG-vaccinated populations and immunocompromised patients that might be difficult to obtain due to the high cost [19]. Furthermore, according to systematic review with 37 included studies, there were reasonable numbers of inappropriate TB regimens prescription including type, dose, frequency of dosing and combination in 67% of the studies, despite the quality of reporting studies being low The authors recommended the need to improve implementation of the WHO treatment guidelines. On the other hand, patient education is important as much as health workers, especially in high-risk groups. For instance, employed patients were more likely to adopt adequate infection control strategies [20].

There are some limitations to our study; firstly, the small sample size who responded to our survey. Secondly, the majority of respondents were medical students or intern doctors who have minor clinical experience with TB patients and who did not accurately assess the clinical practice. Thirdly, the results were based on self-reports by the participants which may be biased to present themselves in a positivemanner. Fourthly, we could not assess the knowledge of drug regimen for TB. Nevertheless, the strength of the study is that the findings highlight the level of knowledge in our sample in terms of clinical management of suspected cases, diagnostic tools and radiological findings that were not assessed by other published surveys

Conclusion

Generally speaking, there was good understanding of TB and clinical knowledge among medical students and physicians are particularly important for early detection, management and protective measures. Our survey outlined TB knowledge among our sample, in which, medical students and intern doctors were the majority. Our results showed moderate knowledge regarding TB investigations and excellent knowledge in terms of dealing with positive or suspected cases.

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