ORIGINAL ARTICLE

Tuberculin and Sputum Smear Positivity among Doctors and Paramedics of a Tertiary Care Hospital

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ABSTRACT

Aim: To study tuberculin & sputum smear +ve among doctors & paramedics of a tertiary care hospital.
Methods: The study was carried out in the Department of Pulmonology, Nishtar Hospital, Multan from April 2016 to july2016. A total no of 100 doctors and paramedics (nurses, nursing students and other paramedics like laboratory workers, ward assistants and cleaners), serving in the hospital for more than two years in the pulmonology, medicine, surgery and allied and Pathology department.
Results: Among doctors, 02 (5.4%) cases of sputum smear positive disease was detected while inactive disease was found in 4 (11.4%) subjects. TB infection rate was found to be 65.7%. Among nurses, 3 (11.5%) were detected having active disease and 5 (19.5%) inactive disease. Among nursing students, 4 (20%) were suffering from active disease and 3(15%) inactive disease.
Conclusion: It is concluded from the study that tuberculosis remains an occupational hazard for Doctors and paramedics and strict protective measures should be implemented .also tuberculin positivity along with sputum smear positivity is an effective tool for screening of infection among health care professionals .
Keywords: Tuberculin, Sputum smear, Doctors, Paramedics

INTRODUCTION

Doctors, nurses and other paramedics are always exposed to infections like Hepatitis B and C, HIV, respiratory infections like influenza A and B etc. to name a few. Tuberculosis is no different. It continues to be a global health issue, with over 10 million new cases of active disease diagnosed every year[1]. Health care workers (HCW) serve on the front lines of the battle against TB, and the risk of infection among them is especially high[2,3]. In 2009, the World Health Organization released guidelines on TB Infection Control (TBIC) in resource limited settings, and is now actively promoting TBIC programmes[4] over the years.

A study conducted in central India reported latent TB LTBI prevalence of around 40% among Indian Doctors and other paramedics using either the tuberculin skin test (TST) or the novel interferon-gamma release assays (IGRA). The study found an increased prevalence of LTBI with increasing age, and years worked in health care[5]. Similarly, the annual risk of TB infection (ARTI) among medical and nursing trainees was found to be 5%, 3 times higher than the 1.5% estimated ARTI for the general population in India[6]. The global increase in the incidence of tuberculosis especially coupled with human immuno-deficiency virus (HIV) pandemic and the increase in multi drug resistant tuberculosis (MDR TB) has made this disease a serious occupational hazard for health care workers worldwide[7]. The health care workers who are in regular contact with patients and laboratory workers handling specimens are potentially at risk of contracting tuberculosis [8].

The duration of exposure may be variable and no hard and fast time of exposure is mentioned in the literature but generally a prolonged contact with a highly infectious case is necessary to have a tuberculous infection but on the other extreme it may be acquired even by a single exposure. It has been observed by the British Medical Research Council that the risk of developing tuberculosis is maximum in the first year after infection[9,10].

The health care staff exposed to even smear negative tuberculous patients undergoing procedures like bronchoscopy, chest intubation endotracheal intubation and assisted ventilation have shown a high rate of tuberculin conversion[11,12].

MATERIAL AND METHODS

This descriptive study was carried out after fulfilling the inclusion/exclusion in the Department of Pulmonology, Nishtar Hospital, Multan from April 2016 to July 2016. The study was conducted among health care workers (doctors, nurses, nursing students and other paramedics like laboratory workers, ward assistants etc), serving in the hospital for more than one year in the Medicine and allied, surgical and allied and Pathology department.

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Tuberculin test was done with 5 TU and was read by two doctors trained in chest diseases after 48 hours. It was declared positive if induration was more than 5mm. early morning thick specimen of sputum was checked by trained laboratory assistant on two separate occasions and positive result was declared even if 01 sample was positive for AFB at least 1+ AFB per high power field.

RESULTS

Six males and 08 females were in 2nd decade, 12 males and 18 females in 3rd decade, 18 males and 15 females in 4th decade and 10 males and 13 females were in 5th decade of life. Male to1 ward male servant, 1male ward cleaner and 2 female ward servants. One ward boy was found to have pleural effusion which was lymphocytic exudative. His medical video pleuroscopy was done and biopsy was done from hyperemic inflamed mucosa which on histopathology revealed Tuberculosis. Cervical lymph nodes were found to be enlarged in 07 (07%) cases comprised of 1 male doctor, 02 nurses, 2 nursing students, 1 male paramedic and 1 female ward servant. One ward assistant was found to be a contact case of an MDR TB patient. Gene expert was also performed on his sputum which showed MTB detected and rifampicin resistance was also positive in him his culture was also sent for DST and he was found to have MDR TB.

Table 1: Group wise results of tuberculin test

Group	n	Mantoux (+ve)	Mantoux (-ve)
Doctors	31	20(66.7%)	11(33.3%)
Nurses & nursing students	44	35(80.6%)	09(19.4%)
Others	25	23(89.4%)	02(10.6%)

Table-2: Results of tuberculin department wise

Department	Sex	n	+ve	-ve
Pulmonology	M	12	11(91.6%)	1(9.3%)
	F	23	20(86.9%)	3(13.1%)
Medicine	M	15	11(73.3%)	4(16,4%)
	F	24	18(75%)	6(25%)
Pathology	M	12	8(66.6%)	4(33.3%)
Surgery	M	09	5(55.5%)	4(33.3%)
	F	05	2(40%)	3(60%)

Table-3: Duration of job/exposure

Duration (Years)	Sex	n	+ve	-ve
1-5	M	20	16(80%)	4(20%)
	F	10	08(80%)	2(20%)
5-10	M	15	12(80%)	3(20%)
	F	24	18(75%)	6(25%)
10-15	M	11	8(73%)	3(27%)
	F	23	20(87%)	3(13%)

Table 4: Radiological examination

Group	Normal	Active TB	Inactive TB	Non-TB
Male (28) doctor	19 (70%)	01 (03.3%)	02 (03.3%)	05 (16.5%)
Other (18) paramedics	07 (40.7%)	04 (14.5%)	03 (18.7%)	04 (25%)
Female doctor (5)	03 (60%)	-	01 (20%)	01 (20%)
Nurses (26)	15 (51.5%)	03 (11.5%)	05 (19.2%)	03 (11.5%)
Nursing students 20	11 (55%)	04 (20%)	03 (15%)	02 (10%)
Other (3) paramedics	01 (33.3%)	01 (33.3%)	01 (33.3%)	-

Table 5: Results of sputum examination

Result	n	Male	Female
+ive	02	1	1
Percentage	10.5	05	05
-ive	34	14	20
Percentage	89.5	36.0	52.5

DISCUSSION

There is relatively little research in this part of the world on epidemiology of TB in this part of the world despite a great debate on incidence of TB in health care professionals .in the current study both tuberculin test with 5 TU and sputum smear microscopy was performed. Although tuberculin positivity alone does not signify the active disease because BCG vaccination as well as past infection may also give rise to positive skin test reactions, but here we labeled the test as positive when induration was more than 5mm and or vesicles formation which was also present in two subjects which were declared active diseases sputum smears were also positive in these cases (more than 02 cases per high power field) our study was in concordance with other national and international studies. One hundred subjects were selected with at least 02 year or more job tenure in the medical and allied units, surgical and allied units and pathology department. Those subjects wee investigated who gave history of fever, cough, sputum/haemoptysis etc. for more than 3 weeks not responding to the antibiotics and treatment.

False positives can happen with the TST, either because of previous BCG vaccination or by sensitization to non tuberculous mycobacteria (NTM. An Italian study also found tuberculin skin positivity in health care workers as high as 11%[13]. Our study is in concordance to the Indian, Italian and Irish studies with a difference that we also done sputum smear microscopy in all these health care professionals[14].

With the WHO TBIC policy guidelines now available[4], the emphasis should be on improving the

safety of health care workers in India. Indeed, the Indian RNTCP has recently published guidance on airborne infection control in healthcare settings, but implementation of this guideline has been weak[15]. Our data suggests that the RNTCP guidelines must be urgently implemented, especially among young nursing and healthcare trainees because of their higher risk of TB infection and impact, especially in young HCWs and trainees. In this subgroup of young HCWs, the benefits outweighed the potential risks and adverse effects of IPT.

While testing all HCWs in India is daunting, we think a strong case can be made for at least doing annual TSTs on young HCWs and trainees – especially medical and nursing students, interns, allied health sciences students who are at risk of TB exposure, and postgraduates during their residency training[16]. In these groups, TST can be an integral component of pre-training/employment screening at the start of training, and repeated every year to identify those who are newly infected. Such convertors must then be screening to rule out active TB disease, before initiation of preventive therapy some limitations of our study is that we did not have a baseline TST therefore no incidence is available. Moreover in our study, the TST was performed only to those HCW who started working and\or were considered at risk for TB during the two year period.

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