

Pulmonary Tuberculosis and Associated Complications among the Health Care workers

LIAQAT ALI DOGAR¹, MUHAMMAD ZAFAR IQBAL², RIAZ HUSSAIN MALIK³

ABSTRACT

Aim: To study the pulmonary TB and its associated complications among health care workers.

Methods: This descriptive study was carried out in the Department of Pulmonology, Postgraduate Medical Institute/Lahore General Hospital, Lahore from March 2012 to October 2012. The study was conducted among health care workers (doctors=35, nurses and nursing students=46 and other paramedics=19 like laboratory workers, ward assistants and cleaners), serving in the hospital for more than one year in the Medicine and allied, surgical and allied and Pathology department.

Results: Among doctors, 1(2.8%) case of active disease was detected while inactive disease was found in 4(11.4%) subjects. Tuberculous 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: Tuberculosis remains an occupational hazard for health care workers.

Keywords: Associated complications, Health care workers, Tuberculosis.

INTRODUCTION

Tuberculosis continues to be a global killer, with over 9 million new cases of active disease diagnosed every year. There has been a tremendous increase in the incidence of tuberculosis in the 20th century both in developed and developing countries. It has become the most important communicable disease in the world today, with over 8 million case of pulmonary tuberculosis occurring each year, 95% of which are in the developing countries¹. Health care workers (HCW) serve on the front lines of the battle against TB, and the risk of infection among HCWs 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 programmes⁴. It has become the most important communicable disease in the world today, with over 8 million cases of pulmonary tuberculosis occurring each year, 95% of which are in the developing countries⁵. As per WHO estimates, more than 300,000 new cases of tuberculosis develop in Pakistan every year, 3 quarters of which are in the productive age group¹.

The global increase in the incidence of tuberculosis aided by 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. WHO declared tuberculosis as a

global emergency⁶. All health care staff in regular contact with patients and laboratory workers handling specimens is potentially at risk of contracting tuberculosis especially those who work with tuberculous patients or specimens⁶.

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 that the risk of developing tuberculosis is maximum in the first year after infection^{7,8}. Health care workers exposed to even smear negative tuberculous patients undergoing endotracheal/ chest intubation, assisted ventilation and fiberoptic bronchoscopy have shown a high rate of tuberculin conversion⁹.

MATERIAL AND METHODS

This descriptive study was carried out in the Department of Pulmonology, Postgraduate Medical Institute/Lahore General Hospital, Lahore from March 2012 to October 2012. The study was conducted among health care workers (doctors=35, nurses and nursing students=46 and other paramedics=19 like laboratory workers, ward assistants and cleaners), serving in the hospital for more than one year in the Medicine, surgical and Pathology departments.

RESULTS

Five males and 11 females were in 2nd decade, 13 males and 15 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 to female ratio was 0.85:1.

¹Department of Pulmonology, PGMI/LGH, Lahore,

²Department of Medicine, GMI/LGH, Lahore,

³Department of Pathology, NMC, Multan

Correspondence to Dr. Liaqat Ali Dogahr, Asst Professor

Table 1: Group wise results of tuberculin test

Group	n	Mantoux (+ve)	Mantoux (-ve)
Doctors	35	23(65.7%)	12(34.3%)
Nurses & nursing students	46	38(82.6%)	08(17.4%)
Others	19	17(89.4%)	02(10.6%)

Table 2: Department wise results of tuberculin test

Department	Sex	n	+ve	-ve
Pulmonology	M	12	11 91.6%	01 9.3%
	F	23	20 86.9%	03 13.1%
Medicine	M	15	11 73.3%	04 16.4%
	F	24	18 75.0%	06 25.0%
Pathology	M	12	08 66.6%	04 33.3%
Surgery	M	09	05 55.5%	04 33.3%
	F	05	02 40.0%	03 60.0%

Table 3: Duration of job/exposure

Duration (years)	Gender	n	+ve	-ve
1-5	M	20	16 80%	04 20%
	F	10	08 80%	02 20%
5-10	M	15	12 80%	03 20%
	F	21	16 76%	05 24%
10-15	M	11	08 73%	03 27%
	F	23	20 87%	03 13%

Table 4: Results of sputum examination

Sputum AFB	n	Male	Female
+ive	04	01	03
Percentage	10.5	02.6	07.9
-ive	34	14	20
Percentage	89.5	36.0	52.5

Table 5: Results of radiological examination

Group	Normal	Active TB	Inactive TB	Non-TB
Male doctors 30	21(70%)	1(03.3%)	3(10%)	5(16.5%)
Other paramedics 16	7(43.7%)	2(12.5%)	3(18.7%)	04(25%)
Female doctors 5	3(60%)	-	1(20%)	01(20%)
Nurses 26	15(51.5%)	93(11.5%)	5(19.2%)	3(11.5%)
Nursing students 20	11(55%)	4(20%)	3(15%)	2(10%)
Other paramedics 3	01 33.3%	01 33.3%	01 33.3%	-

Pleural effusion was found in 7 cases. Two of these were staff nurses, 1 was student nurse, rest of 4 were other paramedics indicating 1 ward male servant, 1 male ward cleaner and 2 female ward servants. Pleural fluid analysis and pleural biopsy was done in all these cases, 5 turned out to be

having tuberculous effusion, 1 was having para pneumonic effusion and 1 was non-specific inflammation. Cervical lymph nodes were found to be enlarged in 11(11%) cases comprised of 1 male doctor, 4 nurses, 2 nursing students, 3 male paramedics and 1 female ward servant.

DISCUSSION

One hundred subjects were selected with at least 1 year or more jobs in the medical and allied units, surgical and allied units and pathology department. Those subjects were investigated who gave history of fever, cough, sputum/haemoptysis etc. for more than 3 weeks not responding to the antibiotics and treatment.

Minimum tenure of work selected inclusion criteria was at least 1 year but majority of the members were working in the said hospital from 5-15 years. In the present study, there were 46 males and 54 females. Out of 46 males, 20 males have duration of job/exposure in between 1-5 years, 15, 5-10 years and 11, 10-15 years. Out of 54 females, 10 females have duration of job/exposure in between 1-5 years, 21, 5-10 years and 23, 10-15 years.

Anaemia (pallor) was present in 35 (35%) subjects, cervical lymphadenopathy in 11(11%) cases and pleural effusion in (7%) cases. Almost similar symptomatology and signs have been described in a study¹⁰. Another study described fever, weight loss and easy fatigue as the commonest symptoms.

Among 35 doctors (30 males and 5 females) the tuberculous infection rate was found to be 65%. The low infection rate in doctors may be due to the higher socio-economic status of this professional class as well as their awareness about the disease and self care. Moreover about 20% of doctors were working in surgical and other wards where chances of exposure and contact to tuberculous patients are relatively less than medical and allied and pathology departments. Bokhari et al found infection rate among doctors to be 58.5% in males and 60% in females¹¹.

One study has found that infection rate was 6-17 times greater among nurses employed in institutions in which there was regular exposure to patients with TB¹². Similar results have been reported from USA where physicians of every age are said to have infection rate more than twice of the population of corresponding age group¹³.

There was 1(33.3%) case of active disease among doctors or our series while the inactive disease was present in (11.4%) doctors. Bokhari et al also found similar sort of results¹¹. In other paramedics of our study, active disease was found in 2 (12.5% males and 1(33.3%) female while inactive disease in 3(18.7%) males and 1(33.3%) female.

Bokhari et al found no case of active disease among male doctors but the inactive disease was present in 18.5% of cases, which is much higher than general population of corresponding age group.

In the present study when we analyze department wise, tuberculin positivity was found 91.6% in 12 males and 86.9% in 23 females HCWs of pulmonology department, whereas in medical wards it was 73.3% in 15 males and 75% in 24 females. It was progressively lower in pathology (laboratory staff) 12 males 66.6% and surgical and allied departments, 9 males (55.5%), 5 females (40). Active disease was detected in 2 males (16.6%) and 2 females (8.6%) while inactive disease was present in 1 male (8.3%) and 5 female HCWs (21.7%) of pulmonology department. In medical and allied 1 male (6.6%) and 3 females (12.5%) were detected having active while 4 females (16.6%) inactive disease. In laboratory staff 3 males (25%) were found having inactive disease. No case of active disease detected in laboratory staff. In surgical and allied 2 males (22.2%) and 2 females (40%) were detected having inactive diseases while no case of active disease was found. It is, therefore, evident from our department wise results that the risk of acquiring tuberculous infection/disease is more in health care workers serving in pulmonology & allied units as compared to those working in other departments. This is probably due to their more exposure and contact to the disease in these departments. Almost similar results were obtained in a study in which incidence of tuberculosis was studied in doctors, nursing staff and medical students. Lower paramedical staff was not included in the study¹⁴.

In present study 11(11%) cases showed cervical lymphadenopathy during general physical examination. Fine needle aspiration cytology/biopsy was done in all the cases. Six (54.5%) cases turned out to be consistent with tuberculosis, 2(18.5%) cases turned out to be non-specific chronic inflammation, 2 (18.2%) cases as reactive hyperplasia and 1(9%) case acute inflammation. Fine needle aspiration cytology/biopsy of cervical and other lymph nodes was done. They obtained the similar percentage of tuberculosis in their study¹⁵.

Pleural effusion was present in 7 cases. Pleural fluid analysis as well pleural biopsy was carried out in all these cases, 5 (71.5%) cases turned out to be tuberculous effusion, 1 (14.2%) acute inflammation and 1 (14.2%) revealed non-specific chronic inflammation.

In a study it was found out tuberculosis as the most common cause of lymphocytic pleural effusion

as diagnosed by pleural effusion analysis and pleural biopsy¹⁶. Similar results have been obtained in other studies^{17,18}.

CONCLUSION

Tuberculosis remains an occupational hazard for HCV.

REFERENCES

1. Anon. The global tuberculosis situation and the new control strategy of the World Health Organization. *Tubecle* 1991; 72: 1.
2. Joshi R, Reingold AL, Menzies D, Pai M. Tuberculosis among health-care workers in low- and middle-income countries: a systematic review. *PLoS Med* 2006; 3: 494.
3. Menzies D, Joshi R, Pai M. Risk of tuberculosis infection and disease associated with work in health care settings. *Int J Tuberc Lung Dis* 2007; 11: 593–605.
4. Organization WH (2009) WHO Policy on TB infection control in health-care facilities, congregate settings and households. Geneva, Switzerland: Stop TB Department, World Health Organization. pp. 1–144.
5. Pai M, Gokhale K, Joshi R, Dogra S, Kalantri SP. Mycobacterium tuberculosis infection in health care workers in rural India: comparison of a whole-blood, interferon-g assay with tuberculin skin testing. *JAMA* 2005; 293: 2746–2755.
6. Joint tuberculosis committee of the British Thoracic Society. Control and prevention of tuberculosis in the United Kingdom. *Tubercle* 1982; 63: 151.
7. Farhat M, Greenaway C, Pai M, Menzies D. False-positive tuberculin skin tests: what is the absolute effect of BCG and non-tuberculous mycobacteria? *Int J Tuberc Lung Dis* 2006; 10: 1192–1204.
8. Hussain M, Rizvi N. Clinical and morphological evaluation of tuberculous peripheral lymphadenopathy. *J Coll Phys Surg Pak* 2003; 13(12): 694-6.
9. Pai M, Zwerling A, Menzies D. Systematic review: T-cell-based assays for the diagnosis of latent tuberculosis infection: an update. *Ann Intern Med* 2008; 149: 177–84.
10. Hoheisel H, Chan BKM, Chan CHS, Chan KS. Endobronchial tuberculosis. *Resp Med* 1994; 593.
11. Bokhari SY, Husain M, Shaikh MY, Absari AA, Ahmad I. Incidence of pulmonary tuberculosis in doctors, nurses and medical students. *Pak J Med Res* 1985; 24: 183-5.
12. Kaleta J, Chaudhry NA. Epidemiological situation of tuberculosis in Pakistan. *JAMA* 1979; 42: 21.
13. Gopinath KG, Siddique S, Kirubakaran H, Shanmugam A, Mathai E. Tuberculosis among healthcare workers in a tertiary-care hospital in South India. *J Hosp Infect* 2004; 57: 339–42.
14. Pai M, Christopher DJ. Protecting young healthcare trainees from tuberculosis: Can we overcome apathy? *National Med J India* 2011; 24: 198–200.
15. Khalid M, Saeed MS. Supraclavicular lymph adenopathy. *Pak J Chest Med* 2000; 8: 9-13.
16. Khurram M, Jaffery AH, Khan HB, Malik MF, Javed S. Evaluation of lymphocytic exudative pleural effusion with pleural biopsy. *J Coll Phys Surg* 2002; 12: 74-7.
17. CTDTI (2009) RNTCP Status Report. New Delhi, India. pp. 1–72.
18. Gopinath KG, Siddique S, Kirubakaran H, Shanmugam A, Mathai. Tuberculosis among healthcare workers in a tertiary-care hospital in South India. *J Hosp Infect* 2004; 57: 339–342.