Original Research Article

Study of Demographic and Clinico-Epidemiological Profile of Patients with Pulmonary Tuberculosis in a Tertiary Care Hospital in Northern India: A Prospective Observational Study

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ABSTRACT

Background: Tuberculosis has recently re-emerged as a major health concern. Each year, approximately 2 million persons worldwide die of tuberculosis and 9 million become infected. India accounts for 26% of all new cases of tuberculosis in the world annually. At the same time, India dealing with the highest burden of tuberculosis in the world. In India, according to the TB India Report 2014 by WHO, 40% of the country's population carries the Mycobacterium tuberculosis (the TB bacteria) in the passive form.

Materials and methods: The study was conducted in patients of pulmonary tuberculosis reporting to Department of Internal Medicine Government Medical College, Jammu. Our study was clinical, observational and prospective study conducted over a period of one year.

Results: The present observational, one year prospective study was conducted on 110 cases of pulmonary tuberculosis presenting to tertiary care centre in north India. In the study, 74 were male (67%) and 36 were females (32%) with a male to female ratio of 2.01:1. Mean age of the study group was 39.49 years with age group of >18yrs Years. Most of the patients were from rural areas 64 (58%).

Key words- Tuberculosis, Sputum positive and negative, BMI, ATT.

INTRODUCTION

Tuberculosis (TB) is contagious and airborne disease. It is an infectious bacterial disease caused by Mycobacterium tuberculosis, which most commonly affects the lungs. Nearly one-third of the global population, i.e. over two billion people, is infected with Mycobacterium tuberculosis and thus at risk of developing the disease. It causes ill-health among millions of people each year and ranks as the second leading cause of death from an infectious disease worldwide, after the Human Immunodeficiency Virus (HIV). Poverty, poor hygiene, illiteracy, drug resistance and poor compliance with medications are important reasons for the rising incidence of tuberculosis .Mycobacteria typically measure 0.5 μm by 3μm, are classified as acid-fast bacilli, and have a unique cell wall structure crucial to their survival.

Mycobacterium tuberculosis is spread by small airborne droplets, called droplet nuclei, generated by the coughing, sneezing, talking or singing of a person with pulmonary or laryngeal tuberculosis. These minuscule droplets can remain airborne for minutes to hours after expectoration Lee RB *et al.,* 2005. [1] Poverty may result in poor nutrition which may be associated with alterations in immune function. On the other hand, poverty resulting in overcrowded

living conditions, poor ventilation, and poor hygiene-habits is likely to increase the risk of transmission of tuberculosis Spence DP *et al.,* 1993. [2] In India, according to the TB India Report 2014 by WHO, 40% of the country's population carries the Mycobacterium tuberculosis (the TB bacteria) in the passive form. About 3.3 million people are suffering from one or the other type of TB and annually 276,000 lives are lost due to tuberculosis. As many as 9.4 million cases of TB are detected worldwide every year. India accounts for more than one-fifth of the same at about 1.98 million. It appears that a major change has come about in detection and treatment of tuberculosis cases between 1990 and 2014. Lonnroth K 2004 [3] in his study indicated that the disease is more common in patients belonging to the rural areas, which is probably secondary to the fact that the issue of illiteracy and poverty are major problems in the rural areas which are neglected in all regards. Individuals infected with TB can have latent TB infection or active TB disease. Those with latent TB infection do not exhibit symptoms and cannot spread the infection to others, whereas those with active TB disease exhibit a range of symptoms and are contagious. In healthy people, infection with Mycobacterium tuberculosis often causes no symptoms, since the person's immune system acts to "wall off" the bacteria Khanum, Sultana and Dhar, 2013. [4] Pulmonary TB should be presumed in a person who presents with persistent cough for three weeks or more, with or without production of sputum and despite the administration of a non-specific antibiotic. Thus Presumptive TB refers to a patient who presents with symptoms or signs suggestive of TB (previously known as a TB suspect). It is believed that the incidence of tuberculosis has reduced from 216 per 100,000 per year in 1990 to 176 per 100,000 per year in the year 2014 in India, the tuberculosis mortality per 100,000 population having been reduced from 38 in year 1990 to 22 in 2014. In absolute numbers, mortality due to TB has scaled down from 330,000 to 270,000 annually.

MATERIALS AND METHODS

The study was conducted in patients of pulmonary tuberculosis reporting to Department of Internal Medicine Government Medical College, Jammu and Chest diseases hospital during the time period from November 2017 to Oct 2018 after approval from members of ethical committee.

Our study is clinical, observational and prospective study conducted over a period of one year.

The data collected was transferred in to a Master chart which is then subjected for statistical analysis. Patients selected with following inclusion /exclusion criteria.

INCLUSION CRITERIA:
1. Patients age >18 yrs.
2. Sputum positive and negative pulmonary cases.

EXCLUSION CRITERIA:
1. Pregnant females.
2. Already diagnosed cases of diabetes mellitus.
3. Tuberculosis patients with other comorbid conditions like HIV/AIDS, malignancy, chronic liver disease.

RESULTS AND DISCUSSION
Distribution of patients according to sex

SEX	NO.	%age
Males	74	67
Females	36	32
Total	110	100.00

Male to Female ratio = 2.01 : 1

Out of 110 patients included in the study, 74 were male (67%) and 36 were females (32%) with a male to female ratio of 2.01:1

Distribution of patients according to age

Age Group{in years}	No.	%age
18- 30	42	38
30-35	23	21
45-60	24	22
>60	21	19
Total	110	100

Mean age -+standard deviation =39.49+17.62

Most of the patients were in the age group of 18- 30years, 42 (38%), followed by 45-60 years 24 (22%), 30-35 years 23 (21%) and >60 years 21(19%).

Thus most cases of pulmonary tuberculosis were in the age group of 18-30 years (38%) which comprised of young population.

Mean age of the study group was 39.49 years with a range of 18 to > 60 years.

Distribution of patients according to BMI

BMI	No.	%age
<18.5	30	27
18.5-24.9	80	73
>24.9	0	0
Total	110	100

Majority of the patients were having BMI in the range of 18.5- 24.9 (73%) followed by BMI of< 18.5 (27) with no patient above the BMI> 24.9.

Distribution of patients according to smoking

Smoking status	No	%age
Smokers	31	28
Non-smokers	79	72
Total	110	100

Most of the patients in the study were non smokers 79(72%) while 31 patients (28%) were smokers. Distribution of patients according to martial status

Martial status	No	%age
Married	61	55.4
Unmarried	49	44.5
Total	110	100

Most of the patients were married 61(55.4%) while unmarried patients comprised 49(44.5%).

Distribution of patients according to their residence

Residence	No.	%age
Urban	46	42
Rural	64	58
Total	110	100

Most of the patients were from rural areas 64 (58%) followed by urban areas 46 (42%).

Distribution of patients according to sputum examination.

Sputum examination	No.	%age
Sputum +ve	53	48
Sputum –ve	57	52
Total	110	100

Most of the patients were diagnosed with pulmonary tuberculosis were sputum -ve 53 (48%) while 53 patients (48%) were sputum +ve. Distribution of patients according to their duration of ATT

ATT duration (in weeks)	No.	%age
< 8	45	41
8-16	38	35
16-24	27	24
Total	110	100

Majority of the patients in the study were in the CONTINUATION PHASE (8-24weeks) of the treatment with about 38 patients in 8-16 weeks of treatment (35%) and 27 in the 16-24 weeks group (24%).

Others were in the INTENSIVE PHASE (<8weeks) of the treatment which were 45 in number (41%).

Distribution of patient according to TB symptoms.

S no.	Symptoms	No. (%age)
1	Cough	102 (93%)
2	Haemoptysis	25 (23%)
3	Fever	60 (54%)
4	Shortness of breath	33 (30%)
5	Chest pain	39 (34%)
6	Weakness	65 (59%)

The study showed that majority of the patients 102 (93%) suffered from cough followed by weakness 65(59%) where as minority of patients 25(23%) suffered from haemoptysis.

Distribution of patients according to ESR

ESR	No .	%age
<50	1	1
50 -100	62	56
>100	47	43
Total	110	100

Most of the patients were having ESR in the range of 50- 100 (56%), followed by >100 (43) and <50(1%).

Tuberculosis is present in India since 1500 BC. Tuberculosis is the 7th leading cause of death (The World Health Report 2003). Poverty, poor hygiene, illiteracy, drug resistance and poor compliance with medications are important reasons for the rising incidence of tuberculosis. The present study was conducted in a tertiary care

hospital for a period of one year wef 1st Nov 2017 to 30th Oct 2018.A total of 110 patients of pulmonary kochs were taken during the study period. Patel *et al.,* 2012 [5] during his study conducted in Indian population concluded that majority patients of TB were male (73.68%) while female were the minority (26.32%). This is same as our study in which 110 patients were included out of which 74 were males (67%) and 36 were females (32%) with a male to female ratio of 2.01:1. Leegaard *et al.,* 2011, [6] Moreno M A *et al.,* 2013 [7] in their study concluded that in developed countries most TB patients tend to be younger. Raghu Raman S *et al.,* 2014 [8] conducted a study in Kerala, in India, where mean age for male and female were 44.9 ± 12.9 and 36.2 ±16.2 respectively among patients with TB. Most of the patients in our study were in the age group of 18-30years, 42 (38%), followed by 45-60 years, 24 (22%), 30-35 years, 23 (21%) and >60 years 21(19%). Thus most cases of pulmonary tuberculosis were in the age group of 18-30years (38%) which comprised of young population. Mean age of the study group was 39.49 years with a range of 18 to > 60 years. The patients in our study were having BMI in the range of 18.5- 24.9(73%) followed by BMI of < 18.5 (27) with no patient above the BMI > 24.9. Siddiqui M S *et al.,* 2011 [9] conducted a study where 48.80% patients exhibited smoking. Likewise, tobacco use including smoking was also found significant with diabetes among TB patients. The patients in our study were non smokers 79(72%) while 31 patients (28%) were smokers. The reason for this may be that the history of smoking may be concealed by some patients willfully. Most of the patients in our study were diagnosed with pulmonary tuberculosis were sputum -ve 53 (48%) while 53 patients (48%) were sputum +ve. Lonnroth K *et al.,* 2004 indicate that the disease is more common in patients belonging to the rural areas, which is probably secondary to the fact that the issue of illiteracy and poverty are major problems in the rural areas which are neglected in all

regards. Most of the patients in our study conducted were from rural areas 64 (58%) followed by urban areas 46 (42%).This may be explained by the fact that people living in the rural areas are not much aware of the importance of nutrition and healthy life style and also the access to health care facilities in rural areas is not easily available. The study showed that majority of the patients 102 (93%) suffered from cough followed by weakness 65(59%) where as minority of patients 25(23%) suffered from haemoptysis. Most of the patients were having ESR in the range of 50- 100 (56%), followed by >100 (43) and <50(1%). Majority of the patients in the study were in the CONTINUATION PHASE (8-24weeks) of the treatment with about 38 patients in 8- 16 weeks of treatment (35%) and 27 in the 16-24 weeks group (24%). Remaining were in the INTENSIVE PHASE (<8weeks) of the treatment which were 45 in number (41%).

Most of the patients were married 61(55.4%) while unmarried patients comprised 49 (44.5%). TOFAZ T 2012 [10] in his study showed that majority of patients (89%) suffered from cough followed by weakness (43%) whereas minority of patients (18%) suffered from haemoptysis. The result of our study is also in concordance with studies in which majority of the patients 102 (93%) suffered from cough followed by weakness 65(59%) where as minority of patients 25(23%) suffered from haemoptysis.

CONCLUSIONS

The present observational, one year prospective study was conducted on 110 cases of pulmonary tuberculosis presenting to tertiary care centre in north India.

❖ Patients enrolled were in the age group of >18 yrs with both sputum +ve and sputum –ve status of either sex. In the study, 74 were male (67%) and 36 were females (32%) with a male to female ratio of 2.01:1.

❖ Mean age of the study group was 39.49 years with age group of >18 years.

- ❖ Most cases of pulmonary tuberculosis were in the age group of 18-30 years (38%) which comprised of young population.
- ❖ Majority of the patients were having BMI in the range of 18.5- 24.9 (73%).
- ❖ Most of the patients in the study were non smokers 79(72%) while 31 patients (28%) were smokers
- ❖ Most of the patients were married 61(55.4%).
- ❖ Most of the patients were diagnosed with pulmonary tuberculosis were sputum -ve 53 (48%) while 53 patients (48%) were sputum +ve.
- ❖ Majority of the patients in the study were in the CONTINUATION PHASE (8-24weeks) of the treatment with about 38 patients in 8-16 weeks of treatment (35%) and 27 in the 16-24 weeks group (24%).
- ❖ Most of the patients were from rural areas 64 (58%).
- ❖ Most of the patients were having ESR in the range of 50- 100 (56%) In our study 6 (6%) of total patients with pulmonary tuberculosis and diabetes were sputum +ve where as 1(1%) were sputum –ve.
- ❖ Most of the patients who were diabetic and having pulmonary tuberculosis were males 7 (6%) followed by females 2(2%).
- ❖ Most of the patients 102 (93%) suffered from cough followed by weakness 65(59%) where as minority of patients 25(23%) suffered from haemoptysis.

Conflicts of interest: None.

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