IJAM

ORIGINAL RESEARCH PAPER ISSN (O) : 2663 - 046X | ISSN (P) : 2663 - 0451

EPIDEMIOLOGICAL AND RADIOLOGICAL PROFILE OF DRUG SENSITIVE TB PATIENTS REMAINING SPUTUM AFB SMEAR POSITIVE AFTER 2 MONTHS OF ATT

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ABSTRACT tuberculosis continues to be a major cause of morbidity and mortality. Treatment of Tuberculosis is already had long course and in some patients delaying of sputum conversion has been observed. Hence this study was conducted in seventy four patients of Tuberculosis who were on ATT and sputum AFB positive after two months of ATT. Out of 74 patients 32 (43.2%) were severely thin and 70 (94%) patients had cavities in their chest x ray.

KEY WORDS : TB- Tuberculosis, ATT- Anti tubercular drug

INTRODUCTION:

Tuberculosis is an infectious disease caused by M. tuberculosis and less commonly by other organisms of the Mycobacterium complex. The disease continues to be a major cause of morbidity and mortality. [1,2] Globally 18 lakh people die from tuberculosis (TB) each year. India bears nearly 30% of the global tuberculosis burden. . Each year, 8.74 million people develop tuberculosis and nearly 2 million die. There were about 3.8 million bacteriologically positive TB cases in the country[3,4].

Tuberculosis is the commonest opportunistic infection occurring among HIV positive persons in India and it is estimated that 60-70% of HIV positive persons will develop tuberculosis in their lifetime.[5] The DOTS strategy of the RNTCP prescribes treatment for new smear positive patients, who have never taken anti tuberculosis treatment or have taken antituberculosis therapy for less than one month. According to the RNTCP status report, among the 553,116 patients registered for treatment under category I, the cure rate was 83.8%, the default rate 6.4% and the failure rate was 2.3%.[6] Hence this study is required to observe epidemiological features of patients having positive sputum smear for AFB after 2 months of treatment.

MATERIAL AND METHODS:

An observational study was conducted on total seventy four patients had diagnosis of TB and were taking anti TB drugs under DOTS. Study was conducted at Lala Ram Sarup Institute of Tuberculosis and Respiratory Diseases located on Sri Aurobindo Marg in south Delhi over period of a year. The study group consisted of patients who were sputum smear positive for AFB after 2 months of treatment regimen under DOTS.

On the first visit, patients were interviewed on their clinical and treatment histories. For all patients, informed consent was taken in either English or Hindi. The patients' physical characteristics like height and body weight was noted and the body mass index (BMI) was calculated and history of Diabetese melitus, were observed. The patients were subjected to HIV testing with pre-test and post-test counselling. Patients were subjected to do chest X rays.

The chest x-rays were classified as follows:

1) **Minimal**: minimal lesions include those that are of slight to moderate density but do not contain demonstrable cavitation. They may involve a small part of one or both the lungs, but the total extent, regardless of distribution, should not exceed the volume of lung on one side that occupies the space above the second chondrosternal junction and the spine of the forth or body of the fifth vertebra.

2) **Moderately advanced**: moderately advanced lesions may be present in one or both lungs, but the total extent should not exceed the following limits: disseminated lesions of slight to moderate density that may extend throughout the total volume of one lung or the equivalent in both lungs; dense and confluent lesions limited in extent to one –third the volume of one lung; total diameter of cavitation, if present, must be less than 4 cm.

3) **Far advanced**: lesions more extensive than moderately advanced.

For the purpose of simplicity and ease of analysis, less extensive and moderately advanced radiological diseases were clubbed together under "less extensive" disease and far advanced radiological disease was classified as "more extensive" disease.

RESULTS:

The study was conducted among the patients attending the DOTS centres coming under the purview of LRS institute of Tuberculosis and Respiratory diseases. The study group consisted of patients who were sputum smear positive for AFB after two month of category I treatment under DOTS. Patients were given category I treatment, of which those who were sputum smear positive for AFB after 2 month of treatment were enrolled.

Table 1: Baseline characteristics

Epidemiological data		No. of patients	percentage
Age (mean)		34.7	
Gender	Male	53	71.6
	Female	21	28.4
BMI (mean)	16.83		
History of Diabetes		6	8.1
HIV status		2	2.7
Radiological features	Far advance	58	78.6
	Less advance	16	28.4
Cavity in CXR		70	94.6
Initial sputum grading	3+	53	71.6
	Non 3+	21	28.4

Age and sex distribution: The study population consisted of 53 (71.6 %) males and 21 (28.4%) females. The age of the patients in the

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study group ranged from 14 to 70 years with a mean of 34.65 years. Fifty six (75.67 %) of the patients in the study group belonged to the age group of 15-45 years and 18 (24.32 %) were in the age group of 46-75 years.

Table 2: Age distribution

	Age in years		
	15-45	45-65	>65
No.(%) of patients	56 (75.67)	16 (21.62)	2 (2.72)

Figure1: Age distribution

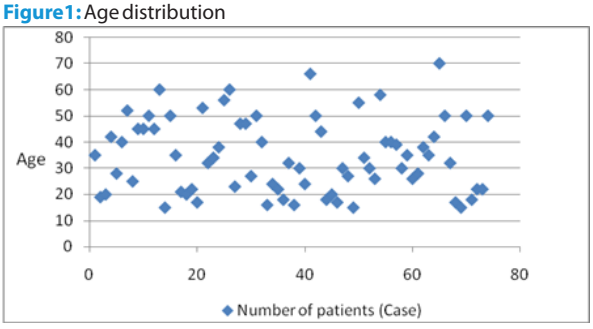


Table 3: Sex distribution

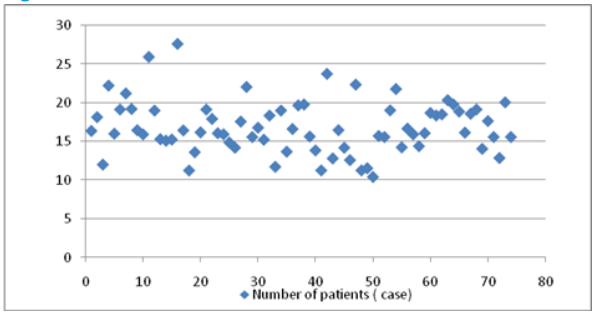
PATIENT GROUPS	GENDER	
	MALE	FEMALE
CASES (n = 74)	53 (71.6%)	21 (28.4%)

BMI of patients: The BMI of patients from the case group ranged from 10.40 to 27.63 kg/m^2 with a mean (SD) of 16.83 3.39 kg/m^2. According to WHO classification 32(43.2%) patients from case group were severely thin.

Table 4: BMI of patients

BMI according to WHO classification	**Type**
	Case
mild thinness	6
	8.1%
moderate thinness	12
	16.2%
severe thinness	32
	43.2%
pre obese	2
	2.7%
normal world 25	22
	29.7%

Figure 2: BMI of Patients



When low BMI was further analysed, it was found that BMI of 32(43.2%) patients was below 16 Kg/m2From study group.

Table 5: BMI of patients

BMI cutoff 16	
	Case
BMI <15.99	32
	43.2%
BMI >= 16	42
	56.8%

CXR profile: All x-rays were reviewed by us and 70 (94.6 %) patients among the study showed the presence of cavitating diseases. The remaining 4 (5.4 %) cases showed no cavity.

Table 6: No of patients with cavity in CX

CAVITY	
	Case
Yes	70
	94.6%
No	4
	5.4%

The x-rays which showed the presence of cavity were further divided on the basis of having single or multiple cavities. In the study group, 9 (12.2 %) and 61(82.4.%) had single and multiple cavities respectively. Thus, presence of cavitating disease was associated with sputum smear positivity after 2 month of treatment.

Table 7: No. of cavities in CXR

CAVITY NUMBER	
	Case
No cavity	4
	5.4%
Single	9
	12.2%
Multiple	61
	82.4%

Extent of disease:

Among the74 patients in the study group, 16(21.6%) had less extensive disease and 58 (78.4%) more extensive disease. it is seen that more extensive disease on chest X-ray is associated sputum smear positivity after 2 month of treatment.

Table 8: no of patients and extension of their disease on CXR

PATIENT GROUPS	**EXTENT OF DISEASE**	
	LESS ADVANCED	**FAR ADVANCED**
CASES (n=74)	16 (21.6%)	58 (78.4%)

DISCUSSION:

The aim of this study was to profile the patients who were sputum smear AFB positive after 2 month of treatment regimen under DOTS. The mean age of patients in the study group was 34.65 years and ranged from 16 to 65 years. Gupta et.al.[7] in a study also found mean age of tuberculosis patients 35.56 years In our study, fifty three (71.6%) cases were male and 21(28.4%) cases were of female sex. This is in accordance with the epidemiological findings that tuberculosis is more common among men and it usually affects people in the age group of 15-45 years and hence has severe economic implications for the country as a whole.

There were 6 patients of Diabetes mellitus among the patients in the case group and our patients among the control group. But there was no significant difference in the outcome of the treatment between diabetes group and non-diabetes group. Two patients from the case group turned out to be positive for the Human Immuno-deficiency virus. All HIV positive patients were cured on treatment. Singla et.al.[8] found in a study that the association of diabetes does not alter the final treatment outcome among PTB patients. Banu Rekha et.al.[9] found in a study that at the end of IP the smear conversion rate in PTB, DM-TB and HIV-TB group were similar in the three groups respectively. Balasubramaniam et.al.[10] found in another study that rates of 94% cure were obtained in diabetic patients despite poor glycaemic control. Swaminathan et.al.[11] found in a study that smear and culture conversion rates at 2 months were 70% and 91% respectively in HIV positive patients , indicating good initial response to the intermittent short course regimens used.

.On classifying BMI according to WHO classification 32(43.2%)

patients in case group were severely thin. This shows BMI does have a bad effect on persistent sputum smear positivity and treatment outcome.

Zachariah et.al.[65] found in a study that low BMI was associated with poor outcome. They also found that severe malnutrition was associated with poorer outcome as compared to mild malnutrition. Chheng et.al.[12] found low BMI as a predictor of pulmonary tuberculosis with P value of < .001. Santha et.al.[13] found higher death rates were independently associated with weight < 35 kg (AOR 3.8; 95% CI 1.9 –7.8) among PTB patients.

Radiologically advanced disease in the form of cavitating disease and more extensive involvement of the lungs was observed to be associated with a persistent sputum smear positivity and poor outcome. Singla et.al[8] also had the same observation in their study and they had concluded that cavitating disease on the chest x-ray was a harbinger of poor treatment outcome.

CONCLUSION:

This study concluded that, low BMI, radiological extensive disease and presence of cavitation delays the sputum conversion.

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