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# Obstructive Lung Disease as a Complication in Tuberculosis Survivors: Fate of Tuberculosis.

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## ABSTRACT

**Background:** Successful treatment of TB confirming the bacteriological clearance from involved site or completion of chemotherapy does not assess structural and functional effects on the involved organ. This study has been conducted to assess the post tubercular sequelae in cured pulmonary tuberculosis patients. **Methods:** It was an observational hospital based study conducted on about 120 patients attending or being admitted in the department of Pulmonary Medicine after fulfilling the inclusion criteria India to assess the post tubercular sequelae by using spirometry. **Results:** Out of 120 patients, 20 patients were excluded from the study as they could not perform the test at all. Hence a total of 100 patients were finally enrolled in the study. The prevalence of pulmonary impairment was only 32% with predominant lung function abnormality being obstructive pattern. **Conclusion:** Out of 120 patients, 20 patients were excluded from the study as they could not perform the test at all. Hence a total of 100 patients were finally enrolled in the study. The prevalence of pulmonary impairment was only 32% with predominant lung function abnormality being obstructive pattern.

***Keywords:*** COPD, Pulmonary tuberculosis, PFT, DLCO.

## INTRODUCTION

Tuberculosis is a global health catastrophe today which is responsible for about > 8 million cases of illness worldwide and nearly 2 million deaths annually. It is the most communicable disease in the world. COPD and tuberculosis are among the world's, first 10 most prevalent diseases , the main burden of the later being in the developing countries. Over the last two decades treatment of TB has significantly improved and patients were successfully treated for TB globally. However such successful treatment of TB confirming the bacteriological clearance from involved site or completion of chemotherapy does not assess structural and functional effects on the involved organ. Majority of the patients with pulmonary tuberculosis have a small structural and functional damage, which does not have significant long term health risks. But some patients with a single episode of pulmonary tuberculosis may herald the beginning of chronic respiratory diseases and have a significant long term health risks in spite of "successful" completion of treatment. COPD (Chronic Obstructive Pulmonary Disease) was the fourth leading cause of death (5.1%) in 2004 and it is expected to occupy third position in 2030 (8.6%). COPD is the major cause of chronic morbidity , it is ranked 11th in 2002 and it is projected to rise to seventh position in 2030.WHO estimates that more than 90% of the deaths are seen in low and ,middle income countries. The primary cause of COPD includes biomass exposure and tobacco smoking. This study has been conducted to assess the post tubercular sequelae by using spirometry in cured pulmonary tuberculosis patients.

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## MATERIALS AND METHODS

It was an observational hospital based study conducted on about 120 patients attending or being admitted in the department of Pulmonary Medicine, TMMC & RC, TMU, Moradabad, U.P, INDIA , who meet the inclusion criteria during the study period of one year. Ethical approval for the study was obtained from the institutional ethical review

committee. The Inclusion criteria were 1. Adults from 18-65 years , who had a definite past history of pulmonary tuberculosis, 2.Patients who had at least taken 20 weeks of anti-tubercular treatment, 3.Patients with radiological evidence of tuberculosis or sequelae of tuberculosis like fibrosis, cavitation, emphysema ,and other destructive lung changes in their latest chest radiographs.

The exclusion criteria were 1.Known case of chronic lung disease before taking ATT, 2. Any known cardiac illness, 3.Severe obesity, 4. Known case of severe Anemia, 5. Known case of Renal failure, 6.Chronic Liver Disease, 7.Known Neuropsychiatric illness, 8. Any known malignancy, 9. Known case of Musculoskeletal disease, 10. Patients who have taken ATT for less than 20 weeks, 11. Known Smokers. All patients included in the study were subjected to a standardized clinical and investigations protocol.

## RESULTS

Out of 120 patients, 20 patients were excluded from the study as they could not perform the DLCO and PFT at all. Hence a total of 100 patients were finally enrolled in the study. Among 100 patients male were more dominant than female in frequency (60%). Age group 36 to 45 years and 56-65 years were more in number (24%).The occupation was divided according to kuppuswamy classification which signifies that clerical ,shop-owners and farmers are maximum (32%). The uneducated were 74% and married were in majority (86%). Pulmonary function parameters and x ray finding were following

**Table 1: Pulmonary Function Parameters In Enrolled Patients.**

| | Number | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| FVC (PRE) | 100 | 0.57 | 4.54 | 2.07 | 0.83 |
| FVC (POST) | 100 | 0.6 | 4.56 | 2.19 | 0.80 |
| FEV1 (PRE) | 100 | 0.37 | 4.25 | 1.49 | 0.78 |
| FEV1 (POST) | 100 | 0.39 | 4.25 | 1.60 | 0.78 |
| FEV1/FVC PRE | 100 | 0.71 | 151 | 70.60 | 18.90 |
| FEV1/FVC POST | 100 | 39 | 96 | 70.42 | 14.45 |
| DLCO | 100 | 23 | 118 | 67.95 | 20.98 |

**Table 2: Pulmonary Function Impairement In Post Tubercular Patients.**

| | Sex | | Total |
|---|---|---|---|
| **Pattern** | **Male** | **Female** | |
| Normal | 19 | 8 | 27 |
| | 31.7% | 20.0% | 27.0% |
| Obstruction | 18 | 14 | 32 |
| | 30.0% | 35.0% | 32.0% |
| Restriction | 9 | 9 | 18 |
| | 15.0% | 22.5% | 18.0% |
| Mixed | 14 | 9 | 23 |
| | 23.3% | 22.5% | 23.0% |
| Total | 60 | 40 | 100 |
| | 100.0% | 100.0% | 100.0% |
| | 2.155(a) | 0.541 | |

| | Obstruction | |
|---|---|---|
| **FEV** | **Number** | **Percentage** |
| Mild | 5 | 15.6% |
| Moderate | 16 | 50.0% |
| Severe | 10 | 31.3% |
| Very Severe | 1 | 3.1% |
| Total | 32 | 100.0% |

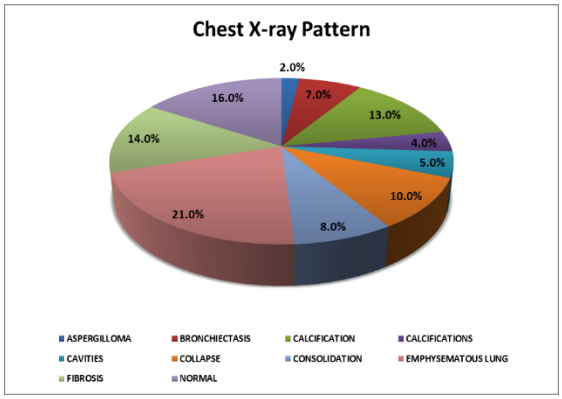


**Figure 1: Chest X-Ray Findings In Post Tubercular Patients**

## DISCUSSION

This was an observational, cross sectional, retrospective study that looked at complications of tuberculosis that persist beyond completion of treatment. In our study, all the 100 patients were Indians, including 60 (60%) were males and 40(40%) were females. The age range was from 18-75 years. The maximum belonged to 36-45 years of age. This is because of the relatively higher prevalence of tuberculosis in India. The prevalence of pulmonary impairment was only 32% with predominant lung function abnormality being obstructive pattern. There has been wide variation in prevalence of pulmonary impairement after TB treatment between various studies with predominant lung function abnormality being obstructive pattern; our findings mirror these studies Lee et al, Ferrer et al Miyamoto J and Koga H, Tarkinda KC et al, Verma et al. These studies showed that airflow obstruction was the most common defect. The pathophysiology of airflow obstruction following pulmonary TB treatment remains speculative. Bronchial stenosis has been shown as the result extrinsic pressure of enlarged peribronchial lymph nodes as well as the consequence of endobronchial involvement of TB with extensive granulation tissue destruction and subsequent fibrosis,. Moreover, similarly to exposure to smoke, TB increases the activity of metalloproteinases enzymes, contributing to pulmonary damage. After investigating on factors associated to Lung function impairement , this study found that increase in time spent between the onset of disease symptoms and the diagnosis of TB

was independently associated with Lung function impairement .We did not show the median duration of symptoms prior to TB diagnosis , which was noted in previous study. Long delay in diagnosis and treatment of TB have been demonstrated to be associated with poorer clinical outcomes. In such patients, the increase of lung damage and the resulting scarring of the lung is probably the cause of pulmonary function deterioration after the completion of TB treatment .In our study, the extent of the disease on the chest radiography was associated with the lung function impairment .This result is in favour of the previous research which showed that the radiological extent of tuberculosis on the chest radiograph is a predictor of pulmonary function impairment 15. Smoking which has also been identified as a risk factor for lung function impairment, but we excluded those patients from our study.

## CONCLUSION

There were few limitations observed in this study. Firstly , as this a thesis research work the total number of patients enrolled were 100 , generating a relatively small sample size with respect to the magnitude of the disease. Secondly, most of our study subjects belonged to middle and lower socioeconomic classes. Urban and rural distinction could not be performed. Thirdly, the health related quality of life assessment could not be carried out due to time limitation.

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