



Pulmonary Medicine

TO STUDY THE LUNG FUNCTION TEST IN PATIENTS WITH POST-PULMONARY TUBERCULOSIS SEQUELAE

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ABSTRACT

Background- To study the lung function test in patients with post-pulmonary tuberculosis sequelae.

Methods- The study was conducted in Sardar Patel Medical College, Associate Group of Hospital, Bikaner in department of Respiratory Medicine. A tertiary care center for respiratory diseases in western part of Rajasthan, India.

Results- 42% patients had obstructive, 35% patients had restrictive, 15% patients had mixed and 8% patients had normal pattern on PFT. 28 smoker and 14 non smoker had obstructive, 13 smoker and 22 non smoker patients had restrictive, 12 smoker and 3 non smoker patients had mixed and 3 smoker and 5 non smoker patient had normal pattern on PFT.

Conclusion- Obstructive pattern of pulmonary functional impairment following treated PTB was more common.

KEYWORDS : PFT, PTB, Obstructive**INTRODUCTION**

Tuberculosis a scourge to the mankind and still a major infectious disease, which is taking a toll of deaths and significant morbidity worldwide. A total of 1.5 million people died from TB in 2018 (including 251 000 people with HIV). In 2018, an estimated 10 million people fell ill with tuberculosis (TB) worldwide. 5.7 million men, 3.2 million women and 1.1 million children.¹

Despite adequate pharmacologic treatment, the disease while healing produces fibrosis, cavitation and calcification leaving permanent sequelae in the lungs.^{2,3} For a significant proportion of patients, these morphologic sequelae continue to be a source of respiratory symptoms and compromised pulmonary function for rest of their life. Such patients present with varying severity of dyspnea, hemoptysis, pulmonary artery hypertension (PAH), or recurrent secondary infections; and are often treated with antitubercular therapy repeatedly.⁴ Hence, sequelae of pulmonary TB constitute a large burden on the public health system.

Post-TB sequelae can have diverse radiological manifestations involving pulmonary parenchyma, airways, vasculature, pleura and mediastinum. The spectrum of these manifestations includes: (a) Parenchymal lesions such as tuberculoma, thin-walled cavity, fibrosis, end-stage lung destruction, aspergilloma and scar carcinoma; (b) airway lesions such as bronchiectasis, tracheobronchial stenosis and broncholithiasis; (c) vascular lesions such as pulmonary or bronchial arteritis and thrombosis, bronchial artery dilatation and Rasmussen aneurysm; (d) mediastinal lesions such as lymph node calcification, esophago-mediastinal or esophago-bronchial fistula, constrictive pericarditis and fibrosing mediastinitis; (e) pleural lesions such as chronic empyema, fibrothorax, bronchopleural fistula and pneumothorax; and (f) chest wall lesions such as rib TB, tuberculous spondylitis and malignancy associated with chronic empyema.⁵ Thus, functional impairment in post-TB sequelae can be secondary to more than one of these diverse morphologic changes. The literature regarding the type of functional defect in post-TB sequelae is similarly heterogeneous; with some studies concluding that airflow obstruction is more common,⁶ while in others, restrictive and mixed restrictive-obstructive defects were more common.⁷

MATERIALS AND METHODS

STUDY POPULATION- The study was conducted in Sardar Patel Medical College, Associate Group of Hospital, Bikaner in department of Respiratory Medicine. A tertiary care center for respiratory diseases in western part of Rajasthan, India

Study Design : Hospital based observational study.

Source of Data: Patients admitted in Tuberculosis Respiratory Disease Hospital, Bikaner.

Study Period: From the approval of thesis till December 2020 or till the sample size was achieved.

Sample Size: Total 100 case of Post-tuberculosis sequelae patients, attending Respiratory Disease Hospital, Bikaner

The procedure followed in this study were in accordance with the ethical standards of our institutional committee on human experimentation.

Inclusion Criteria

1. Those who gave informed consent.
2. Age group 15-90 years old patients.
3. PTB cases completed anti-TB treatment as per the standard guidelines for 6 months.
4. PTB cases completed treatment as per national guidelines and declared cured.
5. Treated MDR TB cases were included.

Exclusion Criteria

1. Extra pulmonary tuberculosis.
2. Pregnant women.
3. Hemodynamically unstable patients.
4. Cases unable to cooperate during spirometry procedure or does not want to enroll in the study.
5. Cases who do not fulfill acceptability and reproducibility criteria of spirometry were excluded from the study.
6. Relapse or recurrent pulmonary tuberculosis cases were excluded.
7. HIV patients

Patients who fulfilled our selection criteria were included with a structured questionnaire regarding present complaints with duration, personal history (occupation, smoking status etc). Detail of past TB and its therapy was recorded according to patient history and documents, whenever available. "Smoker" was defined according to centres for disease control and prevention (CDC), USA guideline as the individuals who smoked at least 100 cigarettes or its equivalent in their lifetime. General survey, vital signs including saturation of oxygen measured by pulse oximetry (SpO₂) and detailed respiratory system examination findings were documented. Chest X-ray (postero-anterior view) was done and evaluated for signs of inactive TB. HRCT chest was done and evaluated for the pleuro-parenchymal involvement of lesions. Subsequently spirometry evaluation was done. The baseline spirometry was performed in subjects with sitting position and highest value of forced expiratory volume in 1 sec (FEV₁) and forced vital capacity (FVC) were obtained. Three acceptable values and at least two reproducible curves were obtained in each subject. Then inhaled salbutamol was given. Spirometry was repeated 20 min after administration of salbutamol. Reversibility was calculated in COPD patient groups. Patients showing FEV₁/FEV_{0.7} < 0.7 with NO significant reversibility was taken.

DATA ANALYSIS: All obtained data were tabulated and important statistical analysis was done with the help of primer software. Microsoft excel and Microsoft word were used to obtain various types of graphs such as bar diagram and pie diagram. Chi-square test was used as test of significance for qualitative data. p value (Probability that the result is true) of <0.05 was considered as statistically significant after assuming all the rules of statistical tests.

OBSERVATIONS

Table 1 : Distribution of cases according to Demographic profile

Mean age	58.21±14.52 Yrs
Male : Female	77 : 23

Table 2: Distribution of cases according to PFT (Pulmonary Function Test).

PFT (Pulmonary Function Test)	Number
Obstructive pattern	42
Restrictive pattern	35
Mixed pattern	15
Normal Pattern	8
Total	100

As per above table 42% patients had obstructive, 35% patients had restrictive, 15% patients had mixed and 8% patients had normal pattern on PFT.

Table 3: Distribution of cases according to PFT (Pulmonary Function Test) with correlation of smoking status

PFT (Pulmonary Function Test)	Smoker	Non Smoker	Total
Obstructive pattern (n=42)	28	14	42
Restrictive pattern (n=35)	13	22	35
Mixed pattern (15)	12	3	15
Normal Pattern (8)	3	5	8
Total	56	44	100
Chi square	11.608		
P value	0.011		

Above table shows that 28 smoker and 14 non smoker had obstructive, 13 smoker and 22 non smoker patients had restrictive, 12 smoker and 3 non smoker patients had mixed and 3 smoker and 5 non smoker patient had normal pattern on PFT.

Table 4 : Distribution of cases according to PFT (Pulmonary Function Test) with correlation of gender.

PFT (Pulmonary Function Test)	Male	Female	Total
Obstructive pattern (n=42)	35	7	42
Restrictive pattern (n=35)	21	14	35
Mixed pattern (15)	14	1	15
Normal Pattern (8)	7	1	8
Total	77	23	100
Chi square	9.420		
P value	0.031		

Above table depicts that 35 male and 7 female had obstructive, 21 male and 14 female patients had restrictive, 14 male and 1 Female patients had mixed and 7 male and 1 female patient had normal pattern on PFT

DISCUSSION

The present study was undertaken to Study the lung function test in patients with post pulmonary tuberculosis sequelae at tertiary care hospital in Western Rajasthan, in the Department of Respirator Medicine, Sardar Patel Medical College, Bikaner.

Chushkin and Ots et al.⁸ observed that approximately half of all PTB patients treated at the local TB dispensary suffered from impaired pulmonary function, a prevalence much higher than that observed in the general population. Pulmonary impairment was identified in 102 (47.7%) of the patients, the pattern being obstructive in 74 (34.6%), restrictive in 18 (8.4%) and mixed in 8 (3.7%) cases.

Manji et al.⁹ documented in their study, the prevalence of individual patterns of impairment was 42%, 13% and 19% for obstructive, restrictive and mixed patterns of lung disease, respectively.⁹

Baiget al.¹⁰ performed study in Pakistan and observed that 55.3% of treated PTB patients presenting with dyspnea and had an obstructive ventilatory defect. Study conducted by Patricio Jiménez et al. had also revealed that an obstructive pattern of pulmonary functional impairment following treated PTB was more common.

CONCLUSION

Obstructive pattern of pulmonary functional impairment following treated PTB was more common.

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