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Clinicoradiological profile and its association with severity of pulmonary hypertension in post-tuberculosis sequelae: a cross-sectional study.

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Abstract

Background

Pulmonary tuberculosis (PTB) remains a major global health challenge. Even after microbiological cure, many patients develop sequelae involving parenchyma, airways, and vasculature, predisposing them to pulmonary hypertension (PH). Evaluating the relationship between clinicoradiological changes and PH severity is essential for improved management.

Objectives

To assess the clinicoradiological profile of post-PTB sequelae and its association with the severity of PH using spirometry, high-resolution computed tomography (HRCT), and echocardiography.

Methods

This hospital-based cross-sectional study included 100 patients with PH previously treated for PTB at a tertiary care center. Clinical symptoms, signs, radiological patterns, spirometry, and echocardiographic findings were recorded. HRCT was used to calculate the Total Lung Score (TLS). PH severity was determined by right ventricular systolic pressure (RVSP) on 2D echocardiography. Statistical associations between TLS, spirometry indices, and PH severity were tested using chi-square and ANOVA, with $p<0.05$ considered significant.

Results

The cohort comprised 66 males and 34 females with a mean age of 46.6 ± 10.5 years. Dyspnea (97%) and cough (79%) were the predominant symptoms. Radiological sequelae included mixed fibrosis with bronchiectasis (30%), fibro-cavitary lesions (27%), and fibrosis (23%). HRCT showed cardiomegaly in 42% and pulmonary artery dilatation in 25–31%. All patients had abnormal spirometry: mixed pattern (49%), obstructive (29%), and restrictive (22%). FEV1 impairment was moderate in 28%, moderately severe in 26%, and severe in 22%. Echocardiography revealed mild PH in 52%, moderate in 30%, and severe in 18%. TLS correlated significantly with PH severity ($p<0.001$). Mean FEV1% and FVC% predicted decreased with higher TLS categories ($p=0.03$ and $p=0.002$).

Conclusion

Post-PTB sequelae frequently lead to mixed ventilatory impairment and pulmonary hypertension, with the extent of radiological involvement strongly predicting PH severity.

Recommendations

Routine follow-up with HRCT, spirometry, and echocardiography should be integrated into post-PTB care to allow early detection and intervention.

Keywords: *Post-tuberculosis sequelae, pulmonary hypertension, spirometry, High-Resolution Computed Tomography, echocardiography, lung function impairment.*
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Introduction

Post-tuberculosis (post-TB) lung disease is increasingly recognized as a cause of chronic respiratory morbidity, with structural sequelae such as fibrosis, bronchiectasis, cavitation, and pleural change persisting long after microbiological cure [5]. These anatomical alterations may

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impair gas exchange, promote hypoxic pulmonary vasoconstriction, and contribute to pulmonary hypertension (PH), a condition associated with substantial functional limitation and adverse outcomes [1,2].

PH is defined hemodynamically and classified by contemporary consensus to guide evaluation and management [1,2]. In clinical practice particularly where invasive right-heart catheterization is not feasible transthoracic echocardiography offers a pragmatic, guideline-endorsed first-line approach to estimate PH probability and right-heart involvement [1,3]. High-resolution computed tomography (HRCT) complements this by characterizing the extent and pattern of post-TB structural damage that may underpin PH physiology [5]. Spirometry provides objective quantification of ventilatory impairment and is interpreted according to standardized ATS/ERS strategies to ensure reproducibility and comparability across studies [4].

Despite these advances, data integrating HRCT-defined post-TB sequelae, spirometric phenotypes, and echocardiographic estimates of PH within a single cohort remain limited. Establishing clinicoradiological correlates of PH severity in post-TB populations could refine risk stratification, inform surveillance, and prioritize timely intervention [1,2,5].

The present cross-sectional study was conducted to evaluate the clinicoradiological profile of post-PTB sequelae and to analyze its association with severity of pulmonary hypertension using spirometry, HRCT, and echocardiography in a tertiary care setting.

Methodology

Study Design and Setting

This hospital-based cross-sectional observational study was conducted in the Department of Respiratory Medicine, Gandhi Medical College and Hospital, Secunderabad, Telangana, over a period of 18 months (September 2022 to March 2024). Gandhi Medical College and Hospital is a major government-run tertiary care teaching institution that serves a large urban and semi-urban population. The hospital houses dedicated facilities for Respiratory Medicine, Radiology, and Cardiology, with well-established infrastructure for high-resolution computed tomography, spirometry, and echocardiography. As a referral centre for tuberculosis and post-tuberculosis sequelae, the institution provides an appropriate setting for comprehensive clinicoradiological and functional assessment of patients with post-PTB lung disease and pulmonary hypertension.

Study Population

Participant Selection

Eligible participants were identified from the Respiratory Medicine outpatient department and inpatient wards. All consecutive patients with a documented history of completed pulmonary tuberculosis treatment and echocardiographically confirmed pulmonary hypertension (RVSP >30 mmHg) presenting during the study period were screened. Individuals meeting inclusion criteria and consenting to participate were recruited using a consecutive sampling technique to minimize selection variation.

Inclusion Criteria

Patients with a documented history of completed PTB treatment.

Diagnosis of PH confirmed by 2D echocardiography (RVSP >30 mmHg).

Both male and female patients aged >18 years.

Exclusion Criteria

Patients with coexisting respiratory diseases such as asthma, interstitial lung disease, or COPD unrelated to PTB.

History of significant smoking or biomass exposure.

HIV-positive patients, transplant recipients, or those with autoimmune diseases.

Cardiac disorders unrelated to pulmonary hypertension.

Patients currently on anti-tubercular therapy or long-term oxygen therapy.

Study Size

A sample size of 100 patients was chosen based on the average annual load of post-tuberculosis patients attending the institution and the feasibility of detailed radiological, functional, and echocardiographic evaluation within the study duration. Previous Indian studies assessing post-TB sequelae have reported sample sizes ranging between 60 and 120, indicating that a cohort of 100 patients would provide adequate variability to study associations between radiological score, spirometric impairment, and pulmonary hypertension severity. The sample was therefore

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considered sufficient for meaningful statistical interpretation in this observational design.

Bias

Several steps were taken to reduce potential sources of bias. Consecutive sampling minimized selection bias. Diagnostic assessments such as HRCT, spirometry, and echocardiography were performed using standardized protocols. Spirometry was conducted by trained technicians following ATS/ERS recommendations to ensure reproducibility. HRCT scans were interpreted by experienced radiologists who were blinded to spirometry and echocardiographic findings, reducing observer bias. Echocardiographic measurements were obtained by cardiologists using uniform criteria to limit variability. Data entry and analyses were cross-checked to avoid transcription errors.

Clinical Evaluation

Demographic data, presenting symptoms, and clinical signs were systematically recorded. Dyspnea, cough, chest pain, haemoptysis, palpitations, abdominal distension, and pedal edema were the primary symptoms assessed.

Radiological Assessment

Chest radiography and high-resolution computed tomography (HRCT) were performed to detect post-TB sequelae such as fibrosis, fibro-cavitary lesions, bronchiectasis, bullae, and mixed forms. The Total Lung Score (TLS) was calculated zone-wise. HRCT evidence of PH including cardiomegaly, main pulmonary artery diameter >29 mm, and right pulmonary artery >16 mm was noted.

Electrocardiography (ECG)

Standard 12-lead ECG was assessed for P pulmonale, right ventricular hypertrophy (RVH), right axis deviation, right bundle branch block (RBBB), QT prolongation, and low voltage complexes.

Echocardiography

All patients underwent 2D echocardiography (Esoate Mylab Gamma). Pulmonary hypertension severity was categorized by right ventricular systolic pressure (RVSP) into mild (30–50 mmHg), moderate (51–65 mmHg), and severe (>65 mmHg).

Pulmonary Function Tests (PFTs)

Spirometry was conducted using a PC-based spirometer. Parameters included forced vital capacity (FVC), forced expiratory volume in one second (FEV1), and FEV1/FVC ratio. Patterns were classified as obstructive, restrictive, or mixed. FEV1% predicted was used to grade severity according to ATS/ERS guidelines.

Statistical Analysis

Data were managed using AI Research cloud platform and analyzed with Python (version 3.11.4). Continuous variables were expressed as mean ± SD, while categorical variables were summarized as frequencies and percentages. ANOVA for continuous variables. A p-value <0.05 was considered statistically significant.

Ethical Considerations

The study was approved by the Institutional Ethics Committee of Gandhi Medical College, Secunderabad. Informed consent was obtained from all participants, and confidentiality was maintained throughout the study.

Results

Participant Flow

During the study period, 138 individuals with a history of treated pulmonary tuberculosis were screened from both outpatient and inpatient services. Of these, 122 individuals were examined for eligibility, while 16 could not be evaluated further due to incomplete medical records or inability to undergo the required investigations. Among the 122 examined, 14 were excluded—nine did not meet the inclusion criteria such as absence of echocardiographic evidence of pulmonary hypertension, three declined consents, and two had exclusion conditions including COPD unrelated to tuberculosis or HIV infection. A total of 108 individuals were therefore confirmed eligible. Of these, eight participants could not complete spirometry or HRCT or withdrew prior to full evaluation. Ultimately, 100 participants were enrolled and included in the analysis, and all completed the required clinical, radiological, spirometric, and echocardiographic assessments.

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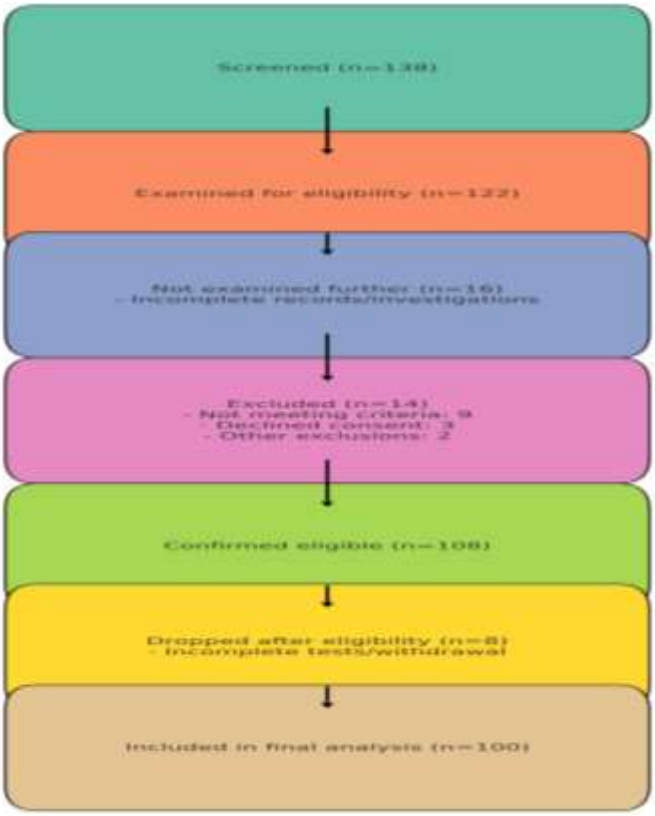

Figure 1: Participant Flow Diagram

Baseline Characteristics

Of the study population, 66 were males and 34 were females, giving a male-to-female ratio of 1.9:1. The mean age was 46.6 ± 10.5 years (range 21–70 years). The predominant presenting symptom was shortness of breath (97%), followed by cough (79%). Other symptoms included abdominal distension (18%), chest pain (15%), palpitations (14%), haemoptysis (12%), loss of appetite (9%), and weight loss (2%). On examination, the most frequent sign was a loud pulmonary component of the second heart sound (66%), followed by raised jugular venous pressure (37%), pedal edema (26%), and ascites (19%) (Table 1).

Table 1. Baseline Characteristics of Study Population (n=100)

Variable	Frequency(n)	Percentage (%)/Mean ± SD
Gender	Male – 66	66.0%
	Female – 34	34.0%
Age (years)	21–70 (range)	Mean: 46.6 ± 10.5
Symptoms	Shortness of breath – 97	97.0%
	Cough – 79	79.0%
	Palpitations – 14	14.0%
	Chest pain – 15	15.0%
	Abdominal distension – 18	18.0%
	Haemoptysis – 12	12.0%
	Loss of appetite – 9	9.0%
	Loss of weight – 2	2.0%
Clinical signs	Loud P2 – 66	66.0%

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	Raised JVP – 37	37.0%
	Pedal edema – 26	26.0%
	Ascites – 19	19.0%

Radiological and Electrocardiographic Findings

Chest radiography and HRCT revealed that mixed fibrosis with bronchiectasis was the most common sequelae (30%), followed by fibro-cavitary changes (27%), and fibrosis alone (23%). Less frequent findings included bronchiectasis (11%) and bullae (9%). HRCT evidence of pulmonary hypertension was noted in the form of cardiomegaly (42%), right pulmonary artery diameter >16 mm (31%), and main pulmonary artery diameter >29 mm (25%). Electrocardiographic abnormalities included P pulmonale (43%), right ventricular hypertrophy (42%), poor R wave progression (31%), right axis deviation (18%), QT prolongation (15%), low voltage complexes (14%), and right bundle branch block (8%) (Table 2).

Table 2. Radiological and ECG Findings

Investigation	Finding	Frequency (n)	Percentage (%)
Chest X-ray/CT	Fibrosis	23	23.0%
	Fibro-cavitary	27	27.0%
	Bronchiectasis	11	11.0%
	Bullae	9	9.0%
	Mixed fibrosis + bronchiectasis	30	30.0%
HRCT Pulmonary Hypertension	Cardiomegaly	42	42.0%
	Right PA >16 mm	31	31.0%
	Main PA >29 mm	25	25.0%
ECG	P pulmonale	43	43.0%
	RVH	42	42.0%
	Poor R wave progression	31	31.0%
	RBBB	8	8.0%
	QT prolongation	15	15.0%
	Low voltage complexes	14	14.0%
	Right axis deviation	18	18.0%

Pulmonary Function Tests

Spirometry demonstrated abnormal ventilatory patterns in all patients. Mixed obstructive-restrictive pattern was most frequent (49%), followed by obstructive (29%) and restrictive (22%). The mean FEV1 was 1.33 ± 0.39 L (57.6 ± 13.6% predicted), and mean FVC was 1.99 ± 0.54 L (71.5 ± 17.8% predicted). Regarding severity grading of FEV1, 28% had moderate, 26% moderately severe, 22% severe, 16% mild, and 5% very severe impairment, while only 3% had normal values (Table 3).

Table 3. Pulmonary Function Test Results (n = 100)

Parameter	Range	Mean ± SD	Distribution (%)
FEV1 (L)	0.48 – 2.78	1.33 ± 0.39	–
FEV1 (% predicted)	18 – 108	57.6 ± 13.6	–
FVC (L)	1.01 – 4.43	1.99 ± 0.54	–
FVC (% predicted)	31 – 126	71.5 ± 17.8	–
Pattern of Spirometry	–	–	Obstructive: 29 Restrictive: 22 Mixed: 49
FEV1 Severity	–	–	Normal: 3

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			Mild: 16 Moderate: 28 Moderately Severe: 26 Severe: 22 Very Severe: 5

Severity of Pulmonary Hypertension and Associations

Based on 2D echocardiography, 52% had mild PH (RVSP 30–50 mmHg), 30% had moderate PH (51–65 mmHg), and 18% had severe PH (>65 mmHg). The severity of PH did not show a significant association with duration since PTB treatment (p = 0.154) (Table 4A).

Table 4A. Severity of Pulmonary Hypertension by 2D Echo and Time Since PTB Treatment (n = 100)

Variable	Mild PH (n=52)	Moderate PH (n=30)	Severe PH (n=18)	p-value
2D Echo (RVSP values)	30–50 mmHg	51–65 mmHg	>65 mmHg	–
Time since PTB treatment	0–5 yrs: 13 6–10 yrs: 26 >10 yrs: 13	9, 12, 9	10, 6, 2	0.154

In contrast, the extent of lung involvement measured by Total Lung Score (TLS) demonstrated a strong correlation with PH severity (p < 0.001). None of the patients with TLS <7 had severe PH, whereas 7 out of 11 patients with TLS >12 had severe PH. Similarly, a significant association was noted between FEV1 severity and PH severity (p < 0.001). Mean FEV1% predicted declined progressively with increasing TLS (66.7% for TLS <7 vs. 51.5% for TLS >12; p = 0.03). Likewise, mean FVC% predicted was significantly reduced with higher TLS categories (91.8% vs. 56.1%; p = 0.002) (Table 4B).

Table 4B. Association of PH Severity with TLS, FEV1 Severity, and Spirometry Measures

Variable	Mild PH	Moderate PH	Severe PH	p-value
Total Lung Score (TLS)	<7: 7 7–12: 45 >12: 0	2, 24, 4	0, 11, 7	<0.001
FEV1 Severity	Normal: 3 mild Mild: 15 mild, 1 severe Moderate: 13 mild, 10 moderate, 5 severe Moderately severe: 11 mild, 12 moderate, 3 severe Severe: 9 mild, 8 moderate, 5 severe Very severe: 1 mild, 4 severe	–	<0.001	
Mean FEV1 % predicted vs TLS	<7: 66.7% 7–12: 56.9% >12: 51.5%	–	0.03	
Mean FVC % predicted vs TLS	<7: 91.8% 7–12: 70.5% >12: 56.1%	–	0.002	

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Discussion

This study demonstrates that pulmonary hypertension (PH) is a frequent and clinically important complication among individuals with post-tuberculosis (post-TB) lung disease. This observation is consistent with recent systematic reviews showing that up to one-third of TB survivors develop some degree of pulmonary vascular involvement, even after successful treatment, due to persistent parenchymal and airway abnormalities [9,10,11]. The predominance of dyspnea and cough in the present cohort is well supported by global evidence: residual respiratory symptoms have been documented in multiple pooled analyses of post-TB populations, where breathlessness and exercise intolerance persist in nearly 50–80% of patients despite microbiologic cure [9,10].

The radiological profile in this study with mixed fibrosis and bronchiectasis being the most common pattern mirrors findings from Indian and international studies. Prior CT-based analyses have shown that fibrosis, traction bronchiectasis, and cavitary destruction are the most frequent structural sequelae, and these abnormalities correlate strongly with impaired functional capacity and symptom severity [7,8]. Such similarities reinforce the external validity of our findings.

Abnormal spirometry in all participants, particularly the predominance of mixed ventilatory defects, is also in agreement with large multi-setting cohorts demonstrating high rates of post-TB airflow obstruction, volume loss, and combined physiologic abnormalities. Studies involving more than 14,000 post-TB individuals have confirmed that spirometric impairment is common and often severe, driven by airway remodeling, parenchymal distortion, and persistent inflammatory injury [6,8–10]. The graded association between worsening FEV1 and increasing PH severity observed in our study similarly aligns with published data indicating that reduced expiratory flow volumes are predictors of vascular stress and adverse cardiorespiratory physiology in post-TB populations [9,10,12].

The strong relationship between Total Lung Score (TLS) and PH severity further supports existing literature showing that CT-defined disease burden is a robust surrogate for functional limitation. Prior studies have demonstrated that greater CT abnormality scores correspond to reduced lung volumes, poorer gas-exchange efficiency, and higher symptom burden [7,9]. Recent meta-analyses also suggest that TB-associated PH is more common in individuals with marked structural destruction, especially those with fibro-cavitary or extensive mixed lesions [11,12].

Echocardiography served as a practical tool for non-invasive identification and grading of PH in this cohort. While right-heart catheterization remains the diagnostic gold standard, several observational cohorts and pooled analyses have relied on echocardiographic measurements to estimate PH burden in post-TB disease, reporting similar prevalence ranges and clinical trends [11,12]. By integrating CT abnormalities, spirometric impairment, and echocardiographic estimates, this study aligns with and strengthens the evolving evidence base describing the interplay between structural lung damage and pulmonary vascular remodeling in TB survivors.

Strengths and Implications

This study provides comprehensive clinicoradiological, functional, and echocardiographic correlation in a sizeable cohort, addressing a gap in Indian data. The results emphasize the importance of structured long-term monitoring in TB survivors.

Generalizability

The findings of this study are most applicable to patients with post-tuberculosis sequelae presenting to tertiary care centers in high TB-burden countries such as India. Given the predominantly middle-aged population, the results may not be directly generalizable to elderly patients or those with significant comorbidities. The exclusion of smokers, patients with other chronic lung diseases, and those with HIV infection limits extrapolation to these subgroups. However, the observed correlations between radiological severity, spirometric impairment, and pulmonary hypertension are biologically plausible and consistent with global evidence, suggesting that the key conclusions may extend to similar populations in other low- and middle-income countries with comparable epidemiological patterns. Larger multicentric studies are needed to validate these findings and enhance their external applicability.

Conclusion

This cross-sectional study highlights the significant burden of pulmonary hypertension among patients with post-tuberculosis sequelae. Dyspnea and cough were the predominant symptoms, while radiological abnormalities such as mixed fibrosis with bronchiectasis were frequent. Abnormal spirometry was universal, with mixed ventilatory defects being most common. Severity of pulmonary hypertension correlated strongly with extent of

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radiological involvement and degree of functional impairment, emphasizing the interplay between structural damage and vascular remodeling. These findings underscore the importance of structured follow-up in TB survivors. Incorporating HRCT, spirometry, and echocardiography into routine evaluation may enable early detection, timely interventions, and better long-term outcomes.

Limitations

The cross-sectional design restricts causal inference. Right heart catheterization, the gold standard for pulmonary hypertension, was not performed. Single-center data and exclusion of comorbid conditions limit wider applicability of findings.

Recommendations

Patients with post-tuberculosis sequelae should undergo structured long-term surveillance to identify progressive respiratory impairment and pulmonary hypertension at an early stage. Routine use of spirometry, HRCT, and echocardiography is recommended for baseline assessment and periodic monitoring. Incorporating these evaluations into standard post-TB care pathways may help in timely recognition of functional decline and vascular complications, thereby guiding therapeutic interventions such as pulmonary rehabilitation, pharmacological therapy, or referral to specialized centers. Multicentric prospective studies are needed to validate these findings, explore preventive strategies, and establish evidence-based guidelines for optimal long-term management of TB survivors.

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Abbreviations

ATS/ERS – American Thoracic Society/European Respiratory Society
CT – Computed Tomography
ECG – Electrocardiography
FEV1 – Forced Expiratory Volume in One Second
FVC – Forced Vital Capacity
HRCT – High-Resolution Computed Tomography
JVP – Jugular Venous Pressure
PA – Pulmonary Artery
PH – Pulmonary Hypertension
PTB – Pulmonary Tuberculosis
PFT – Pulmonary Function Test
RVH – Right Ventricular Hypertrophy
RVSP – Right Ventricular Systolic Pressure
TLS – Total Lung Score
WHO – World Health Organization

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Study has no funding

Conflict of interest

Author declares no cconflict of interest.

Author Ccontributions

PJ-Concept and design of the study, results interpretation, review of literature and preparing first draft of manuscript. Statistical analysis and interpretation, revision of manuscript. **BNJ**-Concept and design of the study, results interpretation, review of literature and preparing first draft of manuscript, revision of manuscript.**JM**-Review of literature and preparing first draft of manuscript. Statistical analysis and interpretation. **SDR-** preparing first draft of manuscript. Statistical analysis and interpretation, revision of manuscript

Data availability

Data available on request

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References

1.Humbert M, Kovacs G, Hoeper MM, Badagliacca R, Berger RMF, Brida M, et al; ESC/ERS Scientific Document Group. 2022 ESC/ERS Guidelines for the diagnosis and treatment of pulmonary hypertension. Eur Heart J. 2022 Oct 11;43(38):3618-3731. doi: 10.1093/eurheartj/ehac237. Erratum in: Eur Heart J. 2023 Apr 17;44(15):1312. doi: 10.1093/eurheartj/ehad005. PMID: 36017548.

2.Simonneau G, Montani D, Celermajer DS, Denton CP, Gatzoulis MA, Krowka M, et al. Haemodynamic definitions and updated clinical classification of pulmonary hypertension. Eur Respir J. 2019 Jan 24;53(1):1801913. doi: 10.1183/13993003.01913-2018. PMID: 30545968; PMCID: PMC6351336.

3.Augustine DX, Coates-Bradshaw LD, Willis J, Harkness A, Ring L, Grapsa J, et al. Echocardiographic assessment of pulmonary hypertension: a guideline protocol from the British Society of Echocardiography. Echo Res Pract. 2018 Sep;5(3):G11-G24. doi: 10.1530/ERP-17-0071. PMID: 30012832; PMCID: PMC6055509.

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Original Article

4.Stanojevic S, Kaminsky DA, Miller MR, Thompson B, Aliverti A, Barjaktarevic I, et al. ERS/ATS technical standard on interpretive strategies for routine lung function tests. Eur Respir J. 2022 Jul 13;60(1):2101499. doi: 10.1183/13993003.01499-2021. PMID: 34949706.

5.Meghji J, Simpson H, Squire SB, Mortimer K. A Systematic Review of the Prevalence and Pattern of Imaging Defined Post-TB Lung Disease. PLoS One. 2016 Aug 12;11(8):e0161176. doi: 10.1371/journal.pone.0161176. PMID: 27518438; PMCID: PMC4982669.

6.Gupte AN, Paradkar M, Selvaraju S, Thiruvengadam K, Shivakumar SVBY, Sekar K, et al. Assessment of lung function in successfully treated tuberculosis reveals high burden of ventilatory defects and COPD. PLoS One. 2019 May 23;14(5):e0217289. doi: 10.1371/journal.pone.0217289. Erratum in: PLoS One. 2019 Dec 5;14(12):e0226389. doi: 10.1371/journal.pone.0226389. PMID: 31120971; PMCID: PMC6532904.

7.Panda A, Bhalla AS, Sharma R, Mohan A, Sreenivas V, Kalaimannan U, et al. Correlation of chest computed tomography findings with dyspnea and lung functions in post-tubercular sequelae. Lung India. 2016 Nov-Dec;33(6):592-599. doi: 10.4103/0970-2113.192871. PMID: 27890986; PMCID: PMC5112814.

8.Santra A, Dutta P, Manjhi R, Pothal S. Clinico-Radiologic and Spirometric Profile of an Indian Population with Post-Tuberculous Obstructive Airway Disease. J Clin Diagn Res. 2017 Mar;11(3):OC35-OC38. doi: 10.7860/JCDR/2017/24555.9529. Epub 2017 Mar 1. PMID: 28511433; PMCID: PMC5427359.

9.Ivanova O, Hoffmann VS, Lange C, Hoelscher M, Rachow A. Post-tuberculosis lung impairment: systematic review and meta-analysis of spirometry data from 14 621 people. Eur Respir Rev. 2023 Apr 19;32(168):220221. doi: 10.1183/16000617.0221-2022. PMID: 37076175; PMCID: PMC10113954.

10.Taylor J, Bastos ML, Lachapelle-Chisholm S, Mayo NE, Johnston J, Menzies D. Residual respiratory disability after successful treatment of pulmonary tuberculosis: a systematic review and meta-analysis. EClinicalMedicine. 2023 May 8;59:101979. doi: 10.1016/j.eclinm.2023.101979. PMID: 37205923; PMCID: PMC10189364.

11.van Heerden JK, Louw EH, Thienemann F, Engel ME, Allwood BW. The prevalence of pulmonary hypertension in post-tuberculosis and active tuberculosis populations: a systematic review and meta-analysis. Eur Respir Rev. 2024 Jan 17;33(171):230154. doi: 10.1183/16000617.0154-2023. PMID: 38232991; PMCID: PMC10792440.

12.Bhattacharyya P, Saha D, Bhattacherjee PD, Das SK, Bhattacharyya PP, Dey R. Tuberculosis associated pulmonary hypertension: The revelation of a clinical observation. Lung India. 2016 Mar-Apr;33(2):135-9. doi: 10.4103/0970-2113.177433. PMID: 27051098; PMCID: PMC4797429.

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