Original Article

Chronic Respiratory Symptoms among TB Survivors in a High-TB Burden Setting in Indonesia: A Preliminary Study

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Abstract

Background: Tuberculosis (TB) affects over 10 million people worldwide and causes more than 1.4 million deaths in 2019. Despite improvements in TB treatment, many TB survivors experience ongoing health problems. Post-TB lung disease (PTLD) affects 30-60% of treated patients, leading to chronic respiratory impairments and reduced quality of life. Data on PTLD in Indonesia, a country with a high TB burden, are still scarce. We conducted a preliminary study in Bandung to estimate the burden of respiratory health problems among those who completed TB treatment.

Methods: Adults aged 18 years or older with a history of TB treatment and a minimum of 6 months since treatment completion were screened at two primary healthcare centres in Bandung municipality. Data on demographics, previous TB history, and clinical symptoms were collected.

Results: From 133 identified TB survivors, 61 eligible patients were interviewed. Persistent respiratory symptoms, such as cough or shortness of breath, were observed in 6 (9.8%) patients. Among these patients, some had abnormal chest x-ray and/or negative Gene Xpert MTB/RIF results.

Conclusion: Even after completing treatment, nearly 1 in 10 TB survivors experienced chronic respiratory symptoms. Greater efforts and awareness are needed to improve post-TB wellbeing, especially in high-burden settings like Indonesia.

Keywords: post-TB lung disease, preliminary study, respiratory symptoms, tuberculosis

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Submitted: November 6th, 2024
Accepted: July 28th, 2025
Published: July 31st, 2025

J Respirol Indones. 2025
Vol. 45 No. 3: 194–8
https://doi.org/10.36497/jri.v45i3.844

INTRODUCTION

Tuberculosis (TB) affects over 10 million people worldwide, causing more than 1.4 million deaths in 2019.[1] It is estimated that 155 million TB survivors were alive in 2020. While there have been improvements in TB treatment strategies, many TB survivors continue to experience health problems.[2] Mortality in individuals with a history of TB is 3–6 times higher than in those without.[3,4] Lung function impairment persists in 30–60% of patients even after treatment completion, often accompanied by chronic respiratory symptoms and chest X-ray abnormalities.[5–7]

Indonesia currently ranks second in the TB burden, with approximately 960,000 cases in 2022. Data regarding post-TB morbidity and mortality in the Indonesian setting are still limited. Ralph et al demonstrated that more than 25% of TB patients at an outpatient clinic in Papua had moderate to severe lung function impairments and persistent respiratory symptoms even after completing TB treatment.[8] Others have shown that post-TB patients experience symptoms due to post-TB obstructive lung disease.[9,10] Chronic pulmonary fungal infections, such as aspergillosis and histoplasmosis, occur in 10–25% of patients with previous TB history.[11,12]

Post-TB lung disease (PTLD) is defined as chronic respiratory impairment attributable at least in part to previous pulmonary TB.[13] PTLD may affect large and small airways, lung parenchyma, pulmonary vasculature, and pleura, and may be complicated by secondary fungal or bacterial co-

infection. Due to similar clinical presentation, PTLD is often misdiagnosed and mistreated as recurrent TB disease or TB relapse, especially in resource-limited settings where modalities for PTLD diagnostics, such as spirometry and CT scan examination, are scarce.[11,14]

West Java remains one of the provinces with the highest numbers of TB cases, approximately 184,000 cases in 2022. The burden of post-TB sequelae, including PTLD in West Java, is not fully known. Considering this knowledge gap, we conducted a preliminary study in Bandung, an urban city in West Java Province with a dense population and high TB burden, to determine whether patients who completed pulmonary TB treatment experience persistent respiratory symptoms.

METHODS

This descriptive study was performed in Bandung, West Java, Indonesia. Ethical approval was obtained from the Universitas Padjadjaran Research Ethics Committee (785/UN6.KEP/EC/2022).

Adults aged 18 years or older, with a previous history of TB treatment and a minimum duration of 6 months since treatment completion, were identified according to TB registries in two primary healthcare centres (PHCs) in Bandung municipality (Figure 1). Patients with incomplete contact information, ongoing treatment, or less than 6 months since treatment completion were excluded. Eligible individuals were contacted by phone, and interviews were scheduled and performed in person by a trained research nurse.

Sociodemographic data, clinical symptoms (cough, shortness of breath, chest discomfort, haemoptysis, weight loss, fever, fatigue), and TB history were collected using a questionnaire. Patients with chronic respiratory symptoms underwent further microbiological and chest X-ray and GeneXpert MTB/RIF assay. Chest X-rays were evaluated by a radiologist and categorized as abnormal (suggestive or not suggestive of active TB) or normal, based on radiological features such as fibrotic scars, calcified nodules, or volume loss, especially in the upper lobes or hilar area.[15]

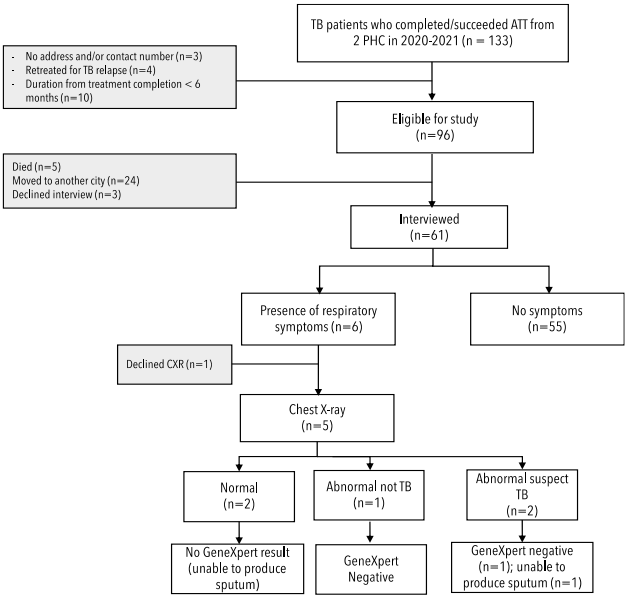

Figure 1. Enrolment of study participants

RESULTS

One hundred thirty-three TB survivors were identified from two PHC registries; 17 were excluded for the reasons mentioned above. Of the 96 eligible and contactable patients, 3 (3%) declined to participate, 24 (25%) had relocated, and 5 (5.2%) had died (Figure 1). Ultimately, 61 (63.5%) patients were interviewed.

Table 1. Characteristics of symptomatic post-TB patients

Sex	Age	Previous TB Treatment	Occupation	Smoking status	Symptoms	Comorbid	Chest X-Ray	Xpert MTB/RIF
Male	32	Treatment completed	Tailor	Non-smoker	Dyspnea	None	Within normal limit	Unable to produce sputum
Male	67	Treatment completed	Food seller	Non-smoker	Cough, dyspnea	None	Abnormal suggestive of active TB	*Mtb* not detected
Female	44	Treatment completed	Housewife	Non-smoker	Dyspnea	Hypertension, asthma	Abnormal suggestive of active TB	*Mtb* not detected
Female	27	Cured	Tax administrator	Non-smoker	Dyspnea	None	Within normal limit	Unable to produce sputum
Female	33	Cured	Housewife	Non-smoker	Cough, hemoptysis, dyspnea	None	Abnormal not suggestive of active TB	*Mtb* not detected

Persistent respiratory symptoms (cough and/or shortness of breath) were observed in 6 (9.8%) patients. Five patients consented to undergo sputum and chest X-ray examination (Table 1). Among them, two had abnormal chest X-rays suggestive of TB, one had abnormal findings unrelated to TB, and two had normal results. The Gene Xpert MTB/RIF assay was negative in two patients; the others could not produce sputum. One patient had a history of controlled asthma prior to TB treatment, and she often experienced dyspnea after completing her treatment regimen.

DISCUSSION

PTLD contributes to morbidity and mortality after TB treatment. The presence of chronic respiratory symptoms and impairment of lung function may affect patients' health and quality of life.[16,17] This preliminary study aims to look at chronic respiratory symptoms in post-TB survivors. We reported that approximately 8% of TB survivors experienced clinical symptoms, even after a successful TB treatment completion.

In countries with a high TB burden, patients with a TB history presenting with chronic respiratory symptoms are often suspected of having recurrent TB, especially when bacteriological examination is negative.[18] Other diagnoses, such as post-TB bronchiectasis, or chronic pulmonary fungal infection (CPA or chronic histoplasmosis), are rarely considered. In this study, nearly 1 in 10 TB survivors had persistent symptoms, some with residual lung abnormalities. Among the three patients with chronic respiratory symptoms and chest X-ray abnormalities, Gene Xpert results were negative.

In such cases, PTLD should be taken into consideration. Additional examinations, such as lung function tests, CT scan of the thorax, and microbiological examination including *Aspergillus* culture and serology, and also culture for non-tuberculous mycobacteria (NTM), should be performed. However, these tests are not always available in resource-limited settings. Therefore, patients are often misdiagnosed as having 'clinical' recurrent TB disease and hence started on anti-TB treatment.

Current epidemiological data on PTLD and post-TB sequelae are still lacking, especially in Southeast Asia, where the TB burden makes up approximately 40% of total global TB cases. Previous studies in Indonesia reported post-TB obstructive lung disease and bronchiectasis in post-TB patients, resulting in poor lung function and reduced quality of life.[9,19] Treatment for these patients includes administration of bronchodilators and pulmonary rehabilitation.[10] Rozaliyani et al and Dewi et al have also shown that chronic pulmonary aspergillosis (CPA) may occur in post-TB patients presenting with clinical symptoms and radiology similar to recurrent active TB disease, highlighting the need to screen such patients with further tests for fungal antibody and CT scan[11,12,20]

LIMITATION

This study has several limitations. First, spirometry was not performed due to limited access and lack of patient consent. The assessment of lung function and capacity would have been valuable in determining PTLD diagnosis. Second, in cases where patients were unable to produce sputum, sputum induction was not performed. Further microbiological testing could help distinguish recurrent TB from infections by NTM, Aspergillus species, or secondary infections due to post-TB bronchiectasis. In Xpert-positive patients, M. tuberculosis culture should have been done to differentiate relapse or reinfection from residual DNA. Third, longitudinal follow-up was not performed in the above patients. Therefore, not possible to determine the treatment received and also the outcomes. Despite the limitations in this study, we showed that some TB survivors had chronic symptoms, underscoring the need to screen for other diagnoses, including PTLD.

CONCLUSION

In summary, nearly 1 in 10 TB survivors in this study reported persistent respiratory symptoms

despite completing treatment. Most had negative Gene Xpert results, raising the possibility of PTLD or other complications. These findings suggest PTLD is an underrecognized contributor to ongoing morbidity. Larger studies are needed to determine its true burden in Indonesia. Future research should include long-term follow-up, lung function testing, imaging, and microbiological evaluation to better identify and manage symptomatic post-TB patients.

ACKNOWLEDGMENTS

The authors wish to thank the TB staff of the primary healthcare centres for their support in facilitating this study. Also, thank the participants for their cooperation, which made this study possible.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

FUNDING

This study was supported by Universitas Padjadjaran Research Grant awarded to IMWD.

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