

## Characteristics and outcomes of endobronchial tuberculosis therapy

Sir,

Nonclassical respiratory symptoms in endobronchial tuberculosis (EBTB) often cause misdiagnosis. EBTB is a health problem due to the formation of bronchostenosis as a complication, regardless of anti-TB administration. The eradication of *Mycobacterium tuberculosis* and prevention of persistent airway stenosis are the goals of EBTB therapy through early diagnosis and optimum therapy.

We report clinical and radiological improvements with acid-fast bacillus (AFB) conversion in EBTB patients with anti-TB drugs, steroids, and bronchoscopic dilatation.

We collected retrospectively data of EBTB patients from January 2013 to December 2017. The protocol was approved by the Ethical Committee of Faculty of Medicine Universitas Indonesia. There were 30 patients with EBTB. The patients' characteristics are summarized in Table 1. The majority were female (86.7%), with a mean age of 28 years, and had never received prior anti-TB drugs (63.3%). The average period of medication was 12 months. Most (80%) were given a combination of rifampicin, isoniazid, pyrazinamide, and ethambutol. Almost all patients received steroids; 73.3% were with inhalation steroids, while 23.3% used systemic steroids. All EBTB patients had bronchoscopic abnormalities. The lesions' location was in the trachea (60%), main left bronchus (40%), right

main bronchus (33.3%), and carina (10%). Bronchoscopic balloon dilatation was done in 23.2% of subjects.

There were improvements in symptoms [Table 2]. All patients had radiological abnormalities in chest X-ray at the beginning of treatment, while on the end, 50% of the patients had normal chest X-ray. There were 3.33% of the patients who had normal bronchoscopic findings and 26.6% of the patients with 100% AFB conversion at the end of therapy.

In this study, we found more females and young age; it is similar with several previous studies.<sup>[1,2]</sup> Female gender, a period of respiratory symptoms more than 4 weeks, and no prior TB therapy might be the independent predictive factors of EBTB in active pulmonary TB patients.<sup>[3]</sup> The correlation between prior TB treatment and comorbidities and risk of EBTB is still unknown.<sup>[4]</sup>

The EBTB symptoms might be affected by the type, location, and a number of airway lesions. The endobronchial involvement in lung TB can be 95%–97% detected using thoracic computed tomography (CT).<sup>[5]</sup> In this study, we found specific EBTB in CT scans such as consolidation (45%), airway obstruction (45%), and a tree in the bud appearance (15% of cases).

Bronchoscopy is not routinely performed in TB patients, but it should be routinely performed to evaluate EBTB lesion

**Table 2: EBTB Therapy Response (n=30)**

Characteristics (n=30)	Before treatment (%)	Last month of treatment (%)
Symptoms		
Dyspnea	83.33	10.00
Cough	80.00	0.00
Productive cough	66.67	10.00
Hemoptysis	3.33	0.00
Stridor	36.67	0.00
Wheezing	33.33	3.33
Chest x-ray		
Normal	0.00	50.00
Fibrosis	33.33	26.66
Infiltrate	53.33	26.66
Consolidation	33.33	26.66
Ground glass opacity	6.66	0.00
Thoracic CT*		
Atelectasis	20.00	0.00
Consolidation	46.66	37.50
Tree in bud	20.00	0.00
Thick or irregular mucosa	13.33	12.50
Airway abnormalities	46.66	37.5
Bronchoscopic findings		
Normal	0.00	3.33
Non-specific bronchitis	16.66	3.33
Hyperemia oedema	6.66	0.00
Granulous	16.66	0.00
Casesous necrosis	3.33	3.33
Ulceration	3.33	0.00
Tumor	3.33	0.00
Fibrostenosis	86.66	86.66
Positive acid fast bacilli sputum	26.67	0.00

\*15 patients had thoracic CT scan prior to therapy and 8 patients had thoracic CT scan in the last month of therapy

**Table 1: Characteristics of EBTB Patients (n=30)**

Characteristics	n	%
Gender		
Male	4	13.3
Female	26	86.7
Age, year		
<40	22	73.3
≥40	8	26.6
Prior anti-tuberculosis drugs		
Yes	11	36.7
No	19	63.3
History of smoking		
Yes	4	13.3
No	26	86.7
Comorbidity		
Yes	7	23.3
No	23	76.6

subtype and therapy response. In the early phases, we can find nonspecific bronchitis lesions or normal bronchus. Meanwhile, fibrostenosis lesion as the advanced phase of the EBTB disease course was often found.<sup>[2]</sup> Bronchoscopic balloon dilatation provides stenosis improvements in this study although the proportion persisted at the end of treatment. Early treatment suggested better outcome.<sup>[6]</sup>

The steroid is often considered beneficial to prevent bronchial stenosis due to its anti-inflammation effect.<sup>[7]</sup> The systemic steroid was given in patients with bronchial stenosis with advanced invasive treatment a few days before and after balloon dilatation. The administration of anti-TB drugs with systemic or inhaled steroid can reduce EBTB symptoms quickly but cannot prevent or diminish existing fibrostenosis lesions.<sup>[8]</sup>

Hence, the combination of pharmacological and invasive bronchoscopic therapy may be further studied for EBTB patients to prevent persistent airway stenosis and improve quality of life.

#### Financial support and sponsorship

Nil.

#### Conflicts of interest

There are no conflicts of interest.

**Wahju Aniwidyarningsih, Mia Elhidsi, Adistya Sari,  
Erlina Burhan**

*Department of Pulmonology and Respiratory Medicine, Faculty of Medicine, Universitas Indonesia - Persahabatan National Respiratory Referral Hospital, Jakarta, Indonesia  
E-mail: mia.elhidsi@gmail.com*

**Submitted:** 09-Mar-2020      **Revised:** 10-Sep-2020

**Accepted:** 15-Sep-2020      **Published:** 31-Dec-2020

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<p><b>Quick Response Code:</b></p> 	<p><b>Website:</b> <a href="http://www.lungindia.com">www.lungindia.com</a></p>
	<p><b>DOI:</b> 10.4103/lungindia.lungindia_132_20</p>

**How to cite this article:** Aniwidyaningsih W, Elhidsi M, Sari A, Burhan E. Characteristics and outcomes of endobronchial tuberculosis therapy. *Lung India* 2021;38:101-3.

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