Responsive Treatment of Pleural Effusion Due to Probable Tuberculosis Infection


ABSTRACT
Early diagnosis of Mycobacterium tuberculosis disease is crucial for initiating treatment and interrupting disease transmission. In keeping with the pathophysiology of disease, bacteriological evidence in extra-pulmonary tuberculosis proves to be difficult. Clinical judgment and radiographic findings are important to establish diagnosis and to evaluate treatment response.

A case of 27 year-old male with shortness of breath and associated TB symptoms is reported. The tuberculin test was highly positive and chest X-ray showed massive right-lung pleural effusion. Pleural analysis showed exudates with high mononuclear cells (98%), protein level of 5.0 g/dL, glucose level of 87mg/dL, and high LDH level (1240 IU/L). The acid-fast bacilli (AFB) tests were negative for pleural fluid and sputum. Cultures of fluid and sputum were also negative. After being treated adequately with non-specific treatment, which showed no improvement and having undergone pleural puncture for his treatment and diagnosis, the patient started to have antituberculosis treatment. His condition was improved significantly as shown by serial of chest X-ray follow-up.

Key words: responsive treatment, pleural effusion, tuberculosis infection

INTRODUCTION
To date, the diagnosis of tuberculosis still depends on staining and culture of sputum or other clinical specimens which has been developed more than 100 years ago. Staining could not differentiate tuberculosis from other mycobacterial infections, and culture requires longer time. Rapid and accurate diagnosis in symptomatic patients is a cornerstone of global tuberculosis control and strategies. Remarkable progress has recently been made through upgrading speed and quality of mycobacteriological services in research centers. But in most of the world where TB still exists as a large burden of public health, those gains are still unrealized.

Pleurisy tuberculosis is second in frequency after lymphadenitis tuberculosis (24%). Conventional methods for diagnosis of pleural TB have been proven inefficient. Direct examination has low sensitivity (0 to 1%). Culture is more sensitive (11 to 50%) but it requires 2 to 6 weeks to grow Mycobacterium tuberculosis. Although cytochemical characteristics of pleural analysis are not specific, Light’s criteria have become a gold standard for identifying exudative effusions. Recently there have been a new diagnostic tools for TB. Methods such as measurements of adenosine deaminase (ADA) activity, quantification of interferon (IFN)-γ and polymerase chain reaction (PCR) to detect specific sequence of M. tuberculosis are presently available.

We reported a case of extra-pulmonary tuberculosis with negative AFB test and culture results which showed significant response to antituberculosis treatment.

CASE ILLUSTRATION
A 27 year-old-Papuan male was admitted with history of gradually progressive shortness of breath. There were orthopnea and exercise-induced dyspnea, but no paroxysmal nocturnal dyspnea and no wheezing. There was no history of edema, palpitation, or chest pain and he had never had such symptoms before. He also complained about continuous fever without chills, pain in all of his body, cough without expectoration, loss of appetite, weight loss but no nausea or vomiting. He had bloody cough 2 years before with no history of tuberculosis contacts ever. He has never been hospitalized nor has had any trauma. He is a theology student with no history of smoking, alcohol consumption or drug abuse. On clinical examination, he was fully alert and looked moderately ill, with normally vital sign. There was
no lymph node enlargement in the neck region. During inspiration the right hemi-thorax was left behind with decreasing fremitus sound and dull percussion, disappearing breathing sound, the rales and wheezing were hardly heard. Left lung and other conditions were normal. Laboratory findings were within normal limits. Chest X-ray showed massive right lung pleural effusion, with significant trachea and heart shifting. The ECG was normal. The first pleural puncture showed 600 cc yellowish fluid. At that time, he was treated with non-specific antibiotics, i.e. Ceftriaxone 2 grams and mucolytic (Potium Nigra). In this patient, the effusion was highly suspected caused by tuberculosis infection, with differential diagnosis of parapneumonic infection and malignancy. Before starting tuberculosis treatment, we performed TB diagnostic examination. Tuberculin test showed 15 mm result. Based on the result of previous puncture that showed minimally clinical and radiological improvement, we performed another thoracocentesis in the hospital ward. Results of pleural analysis showed exudates containing high mononuclear cells, high protein, and high LDH level. The AFB staining and culture were negative for sputum and pleural fluid. Although the mycobacterium tuberculosis had not been proven, antituberculosis treatment with drug category I was started on day 7. The symptoms and radiological result was significantly recovered. Patient was discharged on day 15, followed up by phone to evaluate any side effects such as nausea, vomiting and compliance for 1 week. Since then, the patient continued treatment in Papua.

**DISCUSSION**

Pleural involvement in tuberculosis infection is caused by hypersensitivity reaction on protein and lipopolysaccharide of *Mycobacterium tuberculosis* rather than due to bacterial invasion. Pauci bacillary causes difficulties to increase the sensitivity of conventional methods. Direct examination requires concentration of 10,000 bacteria/mL and culture needs 10 to 100 viable bacilli. The pathophysiology of tuberculosis pleural effusion explains difficulties of *M.tuberculosis* findings in pleural fluid specimens.

Bacteriological examination for TB infection is important to establish diagnosis because there are a lot of other possibilities of diagnose for exudates of pleural fluid results and it is also important to avoid over or under-diagnosis of TB infection itself. In the case reported here, diagnostic tools to find definitive etiology were already performed. Although *M.tuberculosis* could not be detected directly, there were typical symptoms, positive tuberculin test and pleural analysis which were appropriate to Light’s criteria suggesting diagnosis of pleurisy tuberculosis and therefore, antituberculosis drug could be instituted presumptively. The administration of 2 gram Ceftriaxone for 5 days showed no improvement of symptoms and radiology results. A good result was shown after being given specific antituberculosis medication for 1 week. Although tuberculosis pleural effusion may resolve over a period of several months without any treatment, a failure to perform diagnosis and treatment may cause lung fibrosis and involvement of other organs.

New diagnostic tools such as PCR and IFN-γ or ADA to evaluate response on infection have been available and it has been already proven to give better sensitivity and specificity compared to conventional methods. However, it was still not effective and we were not able to perform such methods on this patient due to financial problems.

**CONCLUSION**

Clinical judgement, tuberculin test, and pleural analysis are still important in establishing the diagnosis of pleurisy tuberculosis. Adjuvant treatment should be performed early after the data were enough to conclude tuberculosis infection although the *mycobacteria* could not be detected from AFB test or culture.

**REFERENCES**


