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Is it Tuberculosis or is it not? - A Dilemma in Primary Care

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Abstract

Pulmonary tuberculosis is a major public health concern especially in primary care. Most of the time, the diagnosis and treatment are clear-cut based on the clinical, radiological and laboratory findings. However, the management of tuberculosis in a patient can pose a challenge to the treating physician when Non-Tuberculous Mycobacterium (NTM) is cultured. This case highlights the clinical significance and treatment dilemma of NTM infection in a pulmonary tuberculosis patient from the primary care perspectives.

Keywords: Non- tuberculous mycobacterium; Pulmonary tuberculosis; Chronic cough; Primary care

Introduction

Non- Tuberculous Mycobacterium (NTM) infections are increasingly been reported worldwide where it may mimic a tuberculosis infection [1]. It could be a cause in patients with chronic cough in primary care setting. NTM infections are commonly seen in immune-compromised patients [2]. However, it has also been reported that NTM can cause diseases in immune-competent patients [2,3].

Nonetheless, the presenting symptoms, clinical and radiological findings are almost similar to tuberculosis especially in patients with pre-existing lung disease. Thus, microbiological confirmation is needed in order to deliver the right treatment since most of NTM infections are resistant to anti-tuberculosis drugs [3]. We reported a case of pulmonary tuberculosis with isolation of NTM in the respiratory specimens to highlight the dilemma in managing in primary care.

Case Summary

A 41 year old Malay woman presented to the primary care clinic with persistent productive chronic cough for two months duration. She had no other symptoms such as hemoptysis, fever, chills, loss of weight and appetite. There were no similar symptoms in the family either. She was diagnosed with pulmonary tuberculosis in 2002 previously and had completed treatment. She has no other medical illness.

Clinically she is thin and not in respiratory distress. Her body mass index is 18kg/m². Her blood pressure was 120/80mmHg and pulse rate was 90 beats per minute. BCG scar was present over the left deltoid area. Lung examination revealed reduced air entry on the right upper zone of the lung. Other examinations were unremarkable. Her blood investigations were normal and retroviral status was negative. Sputum for acid-fast bacilli was positive for three consecutive readings and sputum culture was negative for any growth. Chest radiograph revealed opacity and cavitary lung lesion over the right upper zone (Figure 1).

She was diagnosed as Recurrent Pulmonary Tuberculosis based on the investigation and was started with anti-tuberculosis drugs. Upon completing two months of intensive phase, her symptoms still persist with poor weight gain. Nonetheless, her sputum has become negative for acid-fast bacilli.

After six weeks, the Mycobacterium tuberculosis culture and sensitivity grew Atypical Mycobacterium belonging to Runyon Group IV (*M. fortuitum chelonae complex*). A respiratory physician was consulted for possible NTM lung infection. A high resolution CT thorax was planned. However, in view of difficult access to the tertiary center and poor socio-economic status, patient could not afford to be referred for further evaluation. We continued her anti-tuberculosis treatment and monitored her closely. Two months later, she started to become asymptomatic and gained 3kg

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Figure 1: Chest radiograph showing opacity with cavitation over the right upper zone.

during the maintenance phase of the treatment. Another culture and sensitivity for *Mycobacterium* was sent which turned out to be negative. Patient recovered well with improvement of her symptoms and chest radiograph.

Discussion

Pulmonary tuberculosis has been a serious public health problem worldwide. It should raise suspicion in a patient presenting with cough more than two weeks duration [4]. In Malaysia, the incidence of TB cases is high (81.4 per 10000 population in 2010) and new cases have increased from 15,000 in 2005 to 19,251 in 2011 [4].

In countries such as Malaysia, which has high prevalence of pulmonary tuberculosis, any patient with Acid-Fast Bacilli (AFB) positive sputum or chest radiograph findings that is suggestive of active tuberculosis are assumed to have pulmonary tuberculosis and treated with anti-tuberculosis drugs such as in this patient [4].

However, isolation of NTM in sputum culture can pose a dilemma in the management whether the treatment with anti-tuberculosis drugs should be continued or changed. Nonetheless, being in primary care has its own challenges and limitations. A primary care physician must be able to analyze all possibilities with multiple aspects that need to be considered as well as red flags that should be watch for [5,6]. As in this case, NTM infection should be considered in view that she was still symptomatic despite on anti-tuberculosis treatment initially even though her sputum has been negative for AFB.

NTM species are mycobacterial species other than those belonging to the mycobacterium tuberculosis complex which are generally free living organism in the environment [3]. Infections caused by these mycobacteria mainly involve the lungs, lymph nodes, skin and soft tissue especially in the immune-compromised patients [3].

NTM infections of the lungs often occur in the context of pre-existing lung disease especially chronic pulmonary disease, bronchiectasis, cystic fibrosis and previous tuberculosis. Hence, they resemble closely in terms of symptoms, clinical and radiological finding [7]. In view that PTB and NTM symptoms are alike, radiographic changes also have similar and subtle differences. In NTM, changes include thin-walled cavities with less opacity from surrounding parenchyma, more marked involvement of the pleura both on chest radiograph and high-resolution computed tomography scan [3]. However, even with these changes it is difficult to differentiate

it from PTB.

In a study done by Kim et al, found that patients with cavitory lung lesion with positive AFB smears have similar clinical characteristic between PTB and NTM. However, in their study, elderly patients aged more than 65 years old and patients who had previous anti-tuberculous treatment were more likely to develop NTM [7]. In view of this, microbiology confirmation is needed to diagnose NTM.

American Thoracic Society/ Infectious Disease Society of America (ATS/IDSA) in its guideline states that NTM lung disease is diagnosed if NTM isolated from at least two expectorated sputum or one from a bronchial lavage specimen with pulmonary symptoms and abnormalities of chest radiograph or high resolution computed tomography scan of thorax after appropriate exclusion of other diagnosis is made [8].

Despite this, the significance of NTM isolation in respiratory specimens during treatment of pulmonary tuberculosis remains uncertain and not well studied. There have been cases of pulmonary tuberculosis co-existing with NTM infections [5]. HJ Jun et al found that 68 out of 958 patients with pulmonary tuberculosis had positive culture for NTM during treatment of anti-tuberculosis in which 65% of them had underlying lung disease [9]. They also found that the commonest NTM organism cultured is *M. fortuitum* which is a low virulence NTM rather than the others. Park et al found that 14.2% patients with isolated *M. fortuitum*, majority of them had underlying lung disease such as prior tuberculosis [10]. From this study, they concluded that *M. fortuitum* caused colonization rather than true infection which majority of the patients may not received treatment [10]. These findings indicate that isolation of NTM in pulmonary tuberculosis patient is not uncommon.

In view that NTM are abundantly found in environment, recovery of NTM in respiratory specimens culture may indicate infection, colonization or specimen contamination, thus treatment with anti-tuberculosis drugs is continued for this patient. Since *M. fortuitum* is considered as one of the Rapidly Growing Mycobacteria group (RGM) [3], they are generally resistant to the typical anti-tuberculosis agents such as isoniazid and rifampicin [8]. NTM treatment includes macrolides, quinolones and doxycycline and should be used under expert guidance.

Conclusion

The significance isolation of non-tuberculous mycobacterium in pulmonary tuberculosis patient remains uncertain. In a primary care setting, tuberculosis should still be the main concern and important to be treated in patients presenting with chronic productive cough with significant radiographic and sputum findings. Making a diagnosis of NTM of lung disease and treatment of NTM disease is not always a clear-cut decision thus consultation with an expert is needed.

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