CASE REPORT

It is tuberculosis or melioidosis? A clinical diagnostic dilemma

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SUMMARY

Pulmonary Tuberculosis (PTB) is an endemic disease in Malaysia and continues to cause great morbidity and mortality. However, the diagnosis and treatment may pose a challenge to the attending physician since other diseases such as melioidosis can mimic tuberculosis. Hence, the final diagnosis should be done thorough history of illness, physical examination, investigations, and interpretation of findings. We present here a case of a 27-year-old man who presented at our primary care clinic with underlying diabetes mellitus whose symptoms were suggestive of PTB, and who was treated with anti-tuberculosis but later his sputum grew culture *Burkholderia pseudomallei*.

INTRODUCTION

Tuberculosis (TB) is one of the commonest infectious diseases that cause morbidity and mortality worldwide. It is caused by *Mycobacterium tuberculosis complex* and transmits via airborne droplets. In 2015, the World Health Organization (WHO) estimated around 10.4 million people were infected with TB globally.[1] In Malaysia, notified TB cases had dramatically increased from 20,666 cases per year in 2011 to 24, 220 cases per year in 2015.[1]

Patients with PTB, especially the high-risk groups usually presented with pulmonary symptoms such as chronic cough and hemoptysis with non-specific symptoms such as fever, night sweats, weight loss and dyspnoea. Those who presented with these symptoms warrant TB screening as recommended by WHO. Apart from clinical presentation, the diagnosis of TB is supported by laboratory investigations such as detection of acid-fast bacilli (AFB) on smears and cultures from the clinical sample and radiological findings of consolidation with cavitation.

Apart from pulmonary TB (PTB), melioidosis can mimic symptoms of tuberculosis clinically and radiologically. Isolation of *Burkholderia pseudomallei* from sputum culture supported by radiological findings can be considered as having pulmonary melioidosis. We present a case of a 27-year-old gentleman with underlying diabetes mellitus (DM), presented with symptoms typical of PTB with *B. pseudomallei* isolated from the sputum which had caused a dilemma in managing and raises the possible role of *B. pseudomallei* as a respiratory colonizer.

CASE PRESENTATION

A 27-year-old gentleman, a mechanic and a smoker, presented to the primary care clinic with prolonged intermittent fever for one month. The fever was worse at night and associated with chills and rigors. He also complained of productive cough with yellowish sputum for three weeks associated with reduced appetite. He had lost six kilograms of weight within two months. Despite having completed a course of antibiotic (amoxicillin-clavulanic acid), the symptoms persist. He had no history of contact with PTB.

On examination, his temperature was 38.5°C and other vital signs were stable. He was not in respiratory distress. His capillary blood glucose reading on presentation was 10.7 mmol/L. Lungs examination revealed crepitations at the left upper zone. Other physical examinations were unremarkable. A chest radiograph showed multiple cavitations with consolidation changes over the left upper zone as shown in Figure 1.

His blood results showed hemoglobin level of 10.4 g/dL, white blood count of 14.7 10^9/L (81.2% neutrophils, 8% lymphocytes) and platelet of 499 10^9/L with a raised erythrocyte sedimentation rate (ESR) of 130 mm/Hr. His renal profile showed hyponatremia (Na 129 mmol/L), hypokalemia (K 2.8 mmol/L) with normal creatinine (97 umol/L). Liver function test was also noted to be deranged with alkaline phosphatase 126 U/L, alanine transaminase 110 U/L, aspartate transaminase 76 U/L. His HbA1C level was 10.7%. However, the sputum smear samples for AFB were persistently negative.

Based on the patient's history and investigations, he was diagnosed as having smear-negative pulmonary tuberculosis with newly diagnosed diabetes mellitus. Anti-tuberculosis and insulin therapy were initiated. Serial monitoring of his serum electrolytes dramatically improved after initiation of the treatment. However, despite intensive treatment for TB for three weeks, his symptoms instead got worst which warranted admission to the hospital. He became more breathless and was still febrile. A repeat chest radiograph showed worsening of consolidation of the upper and midzone of the left lung. Diagnosis of sepsis secondary to community-acquired pneumonia with underlying PTB smear-negative was made and intravenous Ceftriaxone was started.

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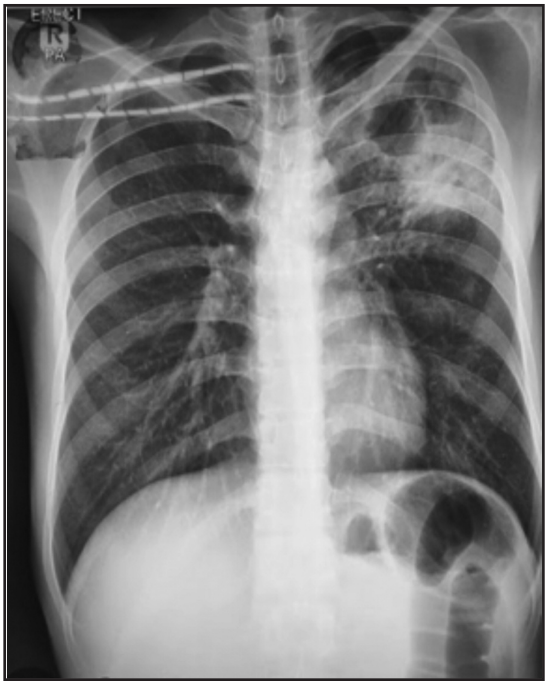

Fig. 1: Chest x-ray showing multiple cavitations with consolidation changes over the left upper zone.

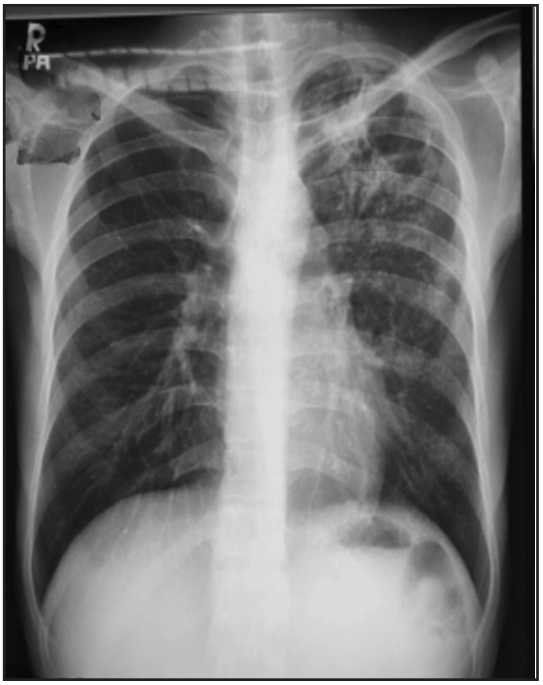

Fig. 2: Chest x-ray after completion of anti-tuberculosis therapy.

While in the ward, the sputum culture and sensitivity grew *B. pseudomallei* which was sensitive to doxycycline, imipenem, ceftazidime and amoxicillin-clavulanic acid. However, his blood culture revealed no growth of any organism. His diagnosis was then revised to pulmonary melioidosis and intravenous ceftazidime was initiated. He was subsequently referred to the respiratory physician for further management. Since his blood culture did not yield any organism of Burkholderia species and he showed excellent response to the previous antibiotic (intravenous ceftriaxone), a decision to discontinue the ceftazidime and continuation of anti-tuberculosis was made.

A week later, his symptoms improved, and he was discharged and seen in the outpatient clinic. Following discharge, he was seen biweekly in the clinic. His symptoms improved and his chest radiograph showed significant improvement as in Figure 2. His treatment was continued for six months. He responded well to treatment with resolution of symptoms, weight gaining and improved chest radiograph with no signs of disease relapse.

DISCUSSION

Melioidosis is caused by gram-negative bacilli *B. pseudomallei* and is endemic in Southeast Asia and tropical Australia. In Malaysia, the exact incidence of melioidosis is unknown, as melioidosis is not considered a notifiable disease even though many cases have been reported throughout this country. Individuals who are regularly in contact with soil and water are at high risk to get infected as it can be transmitted via percutaneous inoculation with contaminated soils or water, inhalation or ingestion. Therefore, it has been referred to as "the great mimicker" because of its similarity to other infections particularly tuberculosis.

Pulmonary melioidosis is the commonest clinical presentation of melioidosis where the patient may have features mimicking tuberculosis such as fever, productive cough, weight loss and upper lobe infiltration with or without cavitation on radiological findings as in this case. Isolation of *B. pseudomallei* from any clinical sample confirms the diagnosis of melioidosis.

However, in view that our patient had delayed response to anti-TB drugs, it has prompted the physicians to relook and revise the diagnosis especially when *B. pseudomallei* was isolated in the sputum.

Co-infection with PTB and melioidosis have been reported in some case reports.[2,3] In each of the case reports, the patient presented with clinical presentation of tuberculosis with concurrent isolation of *B. pseudomallei* from clinical culture. Both anti-TB drugs and chemotherapy for *B. pseudomallei* were commenced, making it difficult to identify whether the patient responded well either to the anti-TB drugs alone or the combination of both.

As in our case, the challenge in management was that the patient had newly diagnosed DM, had delayed response to anti-TB drugs and his clinical presentation worsened at week three of treatment. One of the commonest risk factors for melioidosis is DM, apart from renal disease, chronic alcoholic or other immunized compromised diseases.[4] Hence, a revisit on the diagnosis had to be made when *B. pseudomallei* was isolated. Furthermore, the absence of microbiological evidence of *M. tuberculosis* complex with isolation of *B. pseudomallei* infection on sputum culture made the diagnosis of melioidosis more likely.

However, since the blood culture and sensitivity results showed no growth of any organism and the patient responded well to the initial antibiotic and anti-TB drugs, thus the continuation of the current management was made. If *B. pseudomallei* had been isolated earlier, he would probably have been treated with antibiotics for melioidosis. This could lead to unnecessary exposure to antibiotics and increase the risk of antibiotic resistance. Wiersinga et al suggested that if *B. pseudomallei* is not detected in a subsequent adequate culture of specimen obtained before therapy, completion of the full course of antimicrobial therapy is generally not recommended.[5]

We postulate that *B. pseudomallei* was just a colonizer and not a true pathogen in our case, based on the clinical improvement of the patient after commencement of anti-TB drugs and response to Ceftriaxone. There are case reports that reported spontaneous recovery of melioidosis without antibiotic treatment. In one of the cases, all the patients infected with a mild form of cutaneous melioidosis had spontaneous clearance without receiving antibiotics treatment.[6] As postulated in our case, it might be possible that a lung disease with tuberculosis is considered the same phenomenon.

CONCLUSION

This case highlights the dilemma of the attending physician in diagnosing and managing between tuberculosis and melioidosis. As treatment for these two diseases is entirely different, it is crucial to differentiate between these two. It also raises the possibility of *B. pseudomallei* as a respiratory colonizer with spontaneous resolving pulmonary symptoms even though it is rare. Co-infection of melioidosis and tuberculosis should be assessed properly to make a proper treatment for both, thus avoiding unnecessarily costly prescription of broad-spectrum antibiotics and contributing to emerging of antibiotic resistance.

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CONFLICT OF INTEREST

None to declare.

REFERENCES

1. Disease Control Division (TB/Leprosy Sector) Ministry of Health Malaysia. National Strategic Plan for Tuberculosis Control (2016-2020). KKM/BI/5000/2018. Putrajaya:Ministry of Health Malaysia; 2016.
2. Shetty AK, Boloor R, Sharma V, Bhat GH. Melioidosis and pulmonary tuberculosis co-infection in a diabetic. Ann Thorac Med 2010; 5(2): 113-5.
3. Tan SY. Tuberculosis and Melioidosis at Distinct Sites Occurring Simultaneously. Sánchez Pérez HJ, editor. Case Rep Infect Dis 2020; 2020: 9818129.
4. Tang RY, Lim SH, Lam JE, Nurasykin S, Eileen T, Chan YW. A 5-year retrospective study of melioidosis cases treated in a district specialist hospital. Med J Malaysia 2019; 74(6): 472-6.
5. Wiersinga WJ, Currie BJ, Peacock SJ. Melioidosis. N Engl J Med 2012; 367(11): 1035-44.
6. Gibney KB, Cheng AC, Currie BJ. Cutaneous Melioidosis in the Tropical Top End of Australia: A Prospective Study and Review of the Literature. Clin Infect Dis 2008; 47(5): 603-9.