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Case Report

A SUCCESSFUL SALVAGE STORY - BURKHOLDERIAPSEUDOMALLEI PNEUMONIA WITH SEPTICAEMIA IN A HEALTHY ADULT GENTLEMAN

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ABSTRACT

Melioidosis is an infection caused by the facultative intracellular gram-negative bacterium, Burkholderia pseudomallei. The disease characterically occurs in well-defined endemic geographic areas. Severe septicemic disease and fatalities are uncommon in those without defined risk factors, although fulminant presentation has been reported in the apparent healthy subject. We describe the case of a young adult gentleman with no comorbid conditions who presented with acute pneumonia and respiratory failure. Sputum and blood cultures yielded Burkholderia Pseudomallei. Treatment was initiated as per current recommendations, which translated to clinical and radiological resolution. He remains relapse free as of current follow up.

INTRODUCTION

Melioidosis is caused by Burkholderiapseudomallei, a gram negative bacillus, the common presentations of which include pneumonia, osteomyelitis and septic shock. Although pneumonia is the most common presentation, clinical manifestations range from acute fulminantsepsis to chronic infection mimicking tuberculosis[1]. Pneumonia may be the primary presenting feature, or it candevelop secondary to initial disease at a distant focus.The highest incidence of meliodosis is reported from South East Asia and the Northern Territory of Australia[2]. However, there are cases reported from other locations globally. The bacillus is an environmental saprophyte which survives within stagnant water and wet soil in endemic areas; however it has been recognized as a potential bioterrorism agent also.

Fulminant melioidosis and fatalities are uncommon in those without defined risk factors, the most important risk factors being diabetes, hazardous alcohol use, chronic renal disease, and chronic lung disease[3]. Patients with diabetes are at increased risk for clinical disease and bacteremia as well as asymptomatic infection. Both chronic renal failure and urolithiasis increase the risk for symptomatic Melioidosis. *B. pseudomallei* can cause colonization and pulmonary infections in patients with cystic fibrosis. Severe disease has been reported in healthy adults, although much less frequently.

We describe the case of a 20 year old gentleman with no comorbidities who presented with pneumonia and respiratory failure needing ICU admission. Melioidosis was not suspected initially and the initial antimicrobial cover did not include targeted drugs. However, sputum and blood grew B Pseudomallei in 72 hours and antibiotic regime was altered to ceftazidime. He responded well to treatment. The importance of suspecting the entity even in healthy young adults residing in non-endemic areas needs special highlight.

Case History

A 20 year old gentleman with no medical comorbidities presented with high grade fever for 3 days followed by shortness of breath and lethargy for 1 day. He denied usage of tobacco products, ethanol consumption or any high risk sexual behavior. He was non atopic. He was tachypneic with a respiratory rate of 32 / minute and arterial PaO2 on room air was 47 mm of Hg. He was hemodynamically stable. Neck was supple to examination with no palpable peripheral lymphadenopathy or skin lesions. Complete hemogram revealed an elevated total leucocyte count (19,400 / cubic mm) with neutrophil predominance and a raised ESR (84 mm / first

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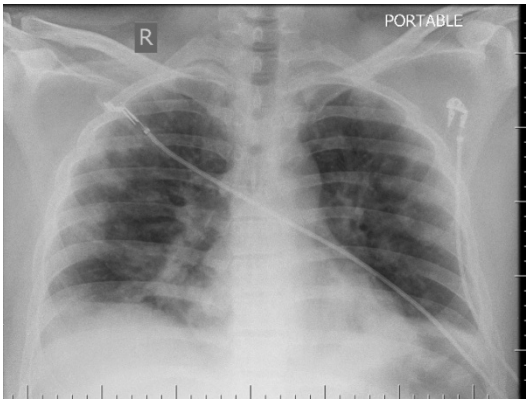
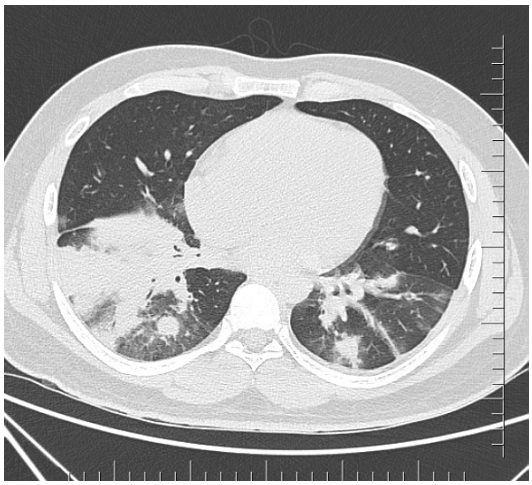
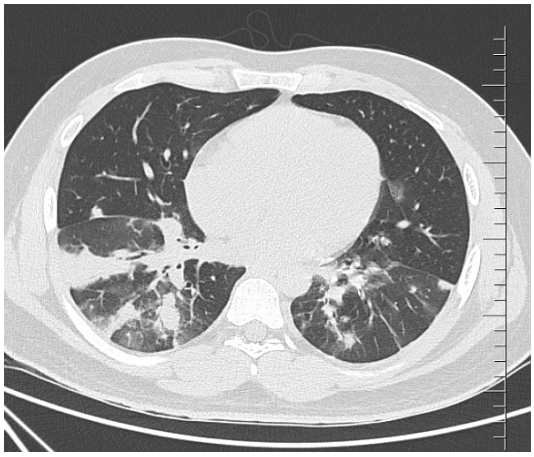
hour). A chest radiograph showed bilateral lower and mid zone alveolar infiltrates (Fig 1). CT scan of the chest with contrast study (Fig 2a and 2b) confirmed the findings of pneumonia. The consolidation appeared nodular at areas with origin from vascular twigs consistent with septic emboli. There was no pleural, mediastinal or airway lesions identified in the CT chest images. Blood sugar, renal functions, liver function tests and coagulation work up was normal.Serology for HIV returned negative. ECG revealed sinus tachycardia and a screening ECHO showed good left ventricular systolic function with no features of pulmonary hypertension.

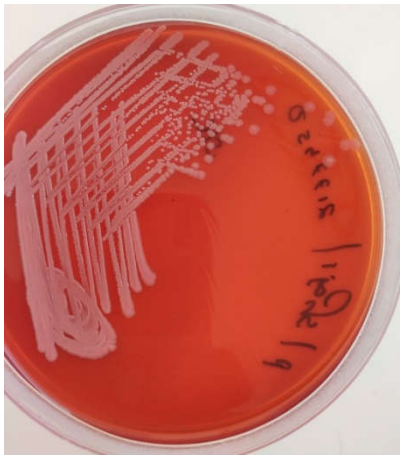
He was initiated on broad spectrum antimicrobials (piperacillin with tazobactam and doxycycline) with a provisional diagnosis of community acquired pneumonia. Blood and sputum was sent for cultures. He exhibited no response in the first 48 hours with continuing high fever spikes and hypoxia. Connective tissue serology was ordered at this juncture. By this time, blood and sputum cultures revealed growth of Burkholderiapseudomallei. The culture plate images and gram staining are depicted in Fig 3a, 3b and 3c. Growth on 5% sheep blood agar showed wrinkled grey coloured colonies and Growth of MacConkeys Agar showed pink wrinkled colonies with a metallic sheen Grams staining showed bipolar stained gram negative bacilli.

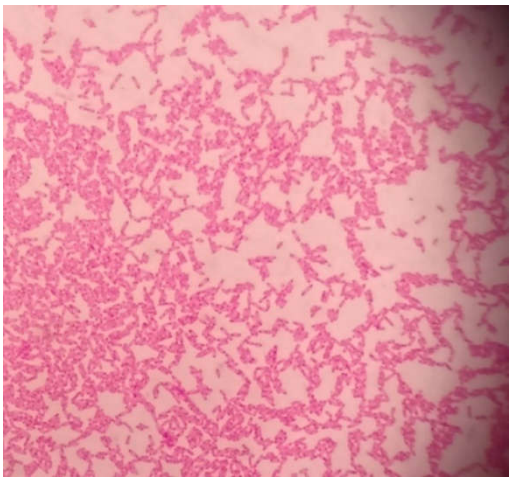
A diagnosis of Melioidosis septicaemia with pneumonia was made and antimicrobials were changed to ceftazidime as per sensitivity. Any intra-abdominal infection, osteomyelitis as well as skin / subcutaneous involvement were looked for with appropriate investigations and ruled out. He had dramatic response in the next 72 hours with defervescence of fever, improvement of hypoxia and early evidence of radiological resolution. 14 days of intravenous ceftazidime was given which led to complete radiological clearance (Fig 4) and the subject returned to his baseline premorbid clinical status. He was discharged on oral cotrimoxazole and is under regular follow up. One and a half month post discharge, he remains relapse free.

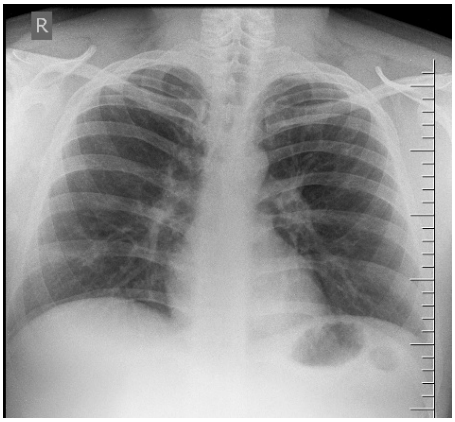












DISCUSSION

Burkholderia Pseudomallei is a facultative intracellular gram negative bacillus with its natural habitat being soil and fresh water. It is a common environmental saprophyte in endemic areas. Geographic terrains where the disease is endemic include Southeast Asia, northern Australia, South Asia, and China. The majority of diagnosed cases are from Thailand[4], Malaysia[5], Singapore, and northern Australia.In addition to geographic predilection, Melioidosis occurs in subjects with well-defined risk factors. Diabetes is the most common risk factor for acquiring melioidosis as reported by many authors including authors from India[6]. In those without medical risk factors, melioidosis most commonly affects adult men in particular geographic areas where contact will soil is present[7].

Adequate laboratory back up is crucial to the diagnosis of melioidosis. This needs a high index of clinical suspicion as well as confirmation by a standard set of tests. B Pseudomallei tends to be reported as non-fermenting gram negative bacilli in resource poor settings, and can potentially lead to treatment failure. Differentiation from Pseudomonas and Acinetobacter is of paramount clinical importance, as B. Pseudomallei is usually community occurred whereas the other two are hospital acquired. Drug sensitivities also exhibit diametrically opposite patterns. B Pseudomallei is sensitive to cotrimoxazole and doxycycline, and intrinsically resistant to aminoglycosides and polymyxins, the pattern being exactly the opposite of the more common hospital acquired non-fermenters. B Pseudomallei is a gram negative, motile, oxidase positive bacillus showing characteristic bipolar staining or safety pin appearance. Rough,wrinkled, pink colonies with a metallic sheen is seen on MacConkey'sagar. Oxidative utilization of glucose, lactose andmaltose is seen. Gelatin liquefaction and nitrate reduction test are positive. Growth in Ashdown's medium is positive with formation of rugose colonies resembling cornflower heads[8].

As previously discussed, the most common clinical manifestations are pneumonia and localized skin / joint infection. Over half of all patients are bacteremic and up to a quarter can present with septic shock[9]. Serological testing in endemic areas reveal that a substantial proportion of *B. pseudomallei* infections are subclinical. Bacteremic spread of the organism can affect virtually any organ system. Treatment of melioidosis may be practically divided into two phases. The initial induction phase in the acute care setting needs parenteral antibiotics given for 10-14 days based on clinical response. Ceftazidime and carbapenems are the agents used in the acute phase[10]. Neither agent is deemed superior as treatment outcomes are almost similar with both these antibiotics. The eradication phase typically spans for 6 months and the agent of choice is co-trimoxazole. In subjects with allergy to this agent, doxycycline may be considered a second alternative. Relapses are common without eradication therapy.Our case is unique in multiple aspects. First of all, our patient did not have any of the medical diseases predisposing to melioidosis. He resided in a low endemic geographic locality. He was a student with no potential contact with soil or contaminated water, which was confirmed on retrospective interrogation. The narration underscores the importance of keeping an open mind to uncommon infections occurring as sporadic cases, which needs optimal utilization of microbiological tests for diagnosis.

Summary

The case reports summarises a young gentleman with community acquired pneumonia due to B Pseudomallei with complications of septicaemia and respiratory failure. Successful therapeutic response was achieved with ceftazidime therapy. Clinical resolution was achieved with 14 days of parenteral therapy. Domiciliary therapy was continued with oral cotrimoxazole and he has sustained clinical, radiological and microbial remission. No relapse has been noted and he remains under clinical follow up. The case highlights the uncommon clinical scenario of meliodosis occurring as community acquired pneumonia in healthy individual without any defined risk factors. Further, he was resident of a non-endemic geographical area for meliodosis, which underscores the need for high index of clinical suspicion and state of the art microbial techniques for conclusive diagnosis.

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