Case Report

Burkholderia pseudomallei: An Uncommon Cause of Bacteraemic Pneumonia in a Diabetic

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ABSTRACT

A 55-year-old woman presented with fever, breathlessness and shock. She was diagnosed to have diabetes mellitus (Type 2) after admission. Blood culture grew *Burkholderia pseudomallei.* The patient responded to intravenous ceftozidime for two weeks and a prolonged course of six months with cotrimoxazole and doxycycline.
[Indian J Chest Dis Allied Sci 2011;53:185-187]

Key words: Type 2 diabetes mellitus, Pneumonia, Sepsis, *Burkholderia pseudomallei.*

INTRODUCTION

Melioidosis, an infection caused by *Burkholderia pseudomallei*, a gram-negative aerobic bacillus, is endemic in northern Australia and parts of South-East Asia, including Vietnam and the Philippines.[1] It has also been reported in tsunami survivors from Indonesia, Sri Lanka and Thailand. The likely modes of transmission include percutaneously through skin abrasions and by inhalation. Minor wounds and abrasions are common in farmers during the planting season, and inoculation through these wounds during their occupational exposure might be the common mode of spread. The organism has also been considered as a potential agent for biological warfare and biological terrorism. However, melioidosis is under-reported from India. We report a case of a middle aged woman who presented with shortness of breath, arthralgias and septic shock and was diagnosed as having melioidosis.

CASE REPORT

A 55-year-old woman presented with a history of fever, severe breathlessness and cough with mucoid expectoration of 10 days duration. She gave history of pain and had difficulty in moving the left shoulder, left elbow and the right knee. There was no history of diabetes or hypertension. She used to work in the rice fields as a farmer 10 years ago. Physical examination on admission revealed tachycardia, a respiratory rate of 40 per minute, and blood pressure of 80/50mmHg. Swelling and tenderness of the left shoulder and right knee were noted. Crepitations were also heard on left side of the chest.

Laboratory investigations revealed random blood sugar of 525mg/dL. Haemoglobin was 13gm/dL, and total leukocyte count was 13,000/cmm with a neutrophilic predominance. Chest radiograph (postero-anterior view) showed a left upper lobe consolidation (Figure). Renal function, liver function tests and 2D echocardiogram were normal. Two sets of blood culture were sent to the microbiology laboratory and empirically, intra-

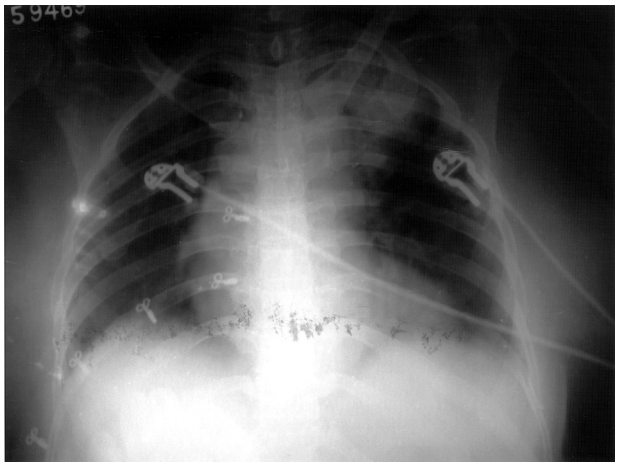

Figure. Chest radiograph (postero-anterior view) showing left upper lobe consolidation.

[Received: August 10, 2010; accepted after revision: January 19, 2011]

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venous ceftriaxone (2g every 12 hourly) was started alongwith six liters oxygen per minute, intravenous fluids, inotropes, and rapid acting insulin. Computed tomography of lower limbs showed a subcutaneous collection and increased density in the medullary fat of the right tibia with an intact cortex. The patient's condition deteriorated with increasing breathlessness. A repeat chest radiograph showed lung infiltrates on both the sides. Antibiotics were changed to intravenous piperacillin with tazobactam. The patient responded clinically after 48 hours. Meanwhile the report of blood culture growing *Burkholderia pseudomallei* was received. Intravenous ceftazidime (2g every 12 hourly) was started as per the sensitivity report. After two weeks, cotrimoxazole (8mg of trimethoprim per kilogram of body weight per day and 40mg of sulfamethoxazole per kilogram per day), given together with doxycycline (100mg twice daily) was started and continued for six months. Swelling and pain of the right lower limb gradually subsided and the patient made a remarkable recovery after one month. There was no recurrence of symptoms after completion of the treatment.

Finally, a diagnosis of type 2 diabetes mellitus with bilateral pneumonia, arthritis involving right knee and left shoulder, septic shock due to *Burkholderia pseudomallei* infection (disseminated melioidosis) was made.

DISCUSSION

The clinical spectrum of melioidosis is extremely broad, and melioidosis has been referred to as "the remarkable imitator".[2] The presentation is variable and includes acute and chronic, localised and systemic, sub-clinical and clinical disease. Most often, it manifestes as a cavitary pneumonia, skin or soft-tissue infection, genitourinary infection, or sepsis.[3] Risk factors for melioidosis include diabetes, renal disease, chronic lung disease, alcoholism, and other causes of immunosuppression.[4] Diabetes mellitus was identified as the most frequent predisposing factor in most case series of melioidosis,[5] as was in our patient, while an acute pulmonary infection is more common. *B. pseudomallei* also causes a chronic pulmonary infection with systemic manifestations that mimic tuberculosis, including chronic cough, fever, night sweats, and cavitary disease.[4]

Clinical manifestations of articular melioidosis are similar to other infective arthritis include localised pain over the underlying bone or joint, associated swelling, painful movements and fever. Melioidosis usually involves the large weight-bearing joints, especially knees followed by ankle, foot, shoulder, pelvis and thoracic or lumbar spine.[6-7] Often soft tissue abscess with osteomyelitis co-exists.

A definitive diagnosis of melioidosis can be made by culturing the organism from a clinical sample. The practice of sending at least two sets of blood cultures prior to initiating antibiotic therapy in a case of community-acquired pneumonia is very important in order to identify both usual and unusual organisms *Burkholderia pseudomallei* may be mistaken for *Pseudomonas* species, since they share several common phenotypic characteristics. Even automated identification systems may wrongly identify the organism as pseudomonas species. A clear understanding of the culture characteristics, biochemical reactions and antibiogram are essential for recognising this pathogen in the diagnostic microbiology laboratory.

Treatment of melioidosis is divided into two stages—an intravenous high intensity stage and an oral maintenance stage to prevent recurrence.[8] Intravenous ceftazidime is the current drug of choice during the intensive stage of melioidosis. All cases of melioidosis, even mild disease, should be treated with an initial intensive therapy of at least two weeks of intravenous ceftazidime followed by oral eradication therapy for a minimum of three months with cotrimoxazole and doxycycline. Meropenem, imipenem and cefoperazone-sulbactam are also active against *B. pseudomallei*. Krishnan *et al*[9] observed initial clinical improvement and resolution of a splenic abscess in a case of septicaemic melioidosis with piperacillin with tazobactam. Interestingly our patient too showed initial improvement with the initial empiric antibiotic piperacillin with tazobactam.

The organism is characteristically resistant to penicillin, ampicillin, first- and second-generation cephalosporins, gentamicin, tobramycin, and streptomycin. It is possible that our patient acquired the infection when she was a farmer but manifested the illness only after she developed diabetes. *B. pseudomallei* can remain dormant for months or years, only to be reactivated when the immunity of the host is compromised.[10] Even with adequate treatment, mortality rates can be high (e.g., 20% in Australia and 40% in north-east Thailand). One of the key problems with treating melioidosis is its recalcitrance to therapy and high relapse rate. Ten percent of the patients have a relapse despite the recommended duration of maintenance therapy.[11]

Studies on the environmental distribution of *B. pseudomallei* as well as sero-prevalence studies would help in investigating the possibility of the disease being endemic in our country.[12] Awareness of this rare infection is important among the clinicians and the microbiologists for appropriate and timely diagnosis and long term management.

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