

Melioidosis in Andaman's: A report of two cases and a short review

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Abstract

Melioidosis, caused by *Burkholderia pseudomallei*, is an emerging infectious disease in the tropical regions of the world. The aetiologic agent is an environmental saprophyte and can be transmitted by percutaneous inoculation, inhalation and ingestion. The risk factors for disease acquisition are type II Diabetes Mellitus (DM), chronic alcohol use, chronic lung or renal disease and immune suppression. The diagnosis is an enigma due to varied manifestations, lack of clinical suspicion and capabilities for conclusive identification. Early diagnosis is crucial for initiating appropriate chemotherapy as Melioidosis respond to only a limited number of antibiotics given over a prolonged period of time and to prevent the worsening of clinical outcome and relapse. We report two cases of Melioidosis with lower extremity involvement, an entity which was probably undiagnosed for long, at Port Blair, Andaman and Nicobar Islands.

Keywords: *Burkholderia pseudomallei*, Melioidosis, Andaman and Nicobar Islands, Risk factors, Chemotherapy.

Introduction

Melioidosis, caused by *Burkholderia pseudomallei*, is an emerging infectious disease in the tropical regions of the world. The disease is endemic in South-eastern Asia and Australia but reports have emerged from wide geographical areas.¹ Environmental factors such as tropical climate, moisture, rainfall play an important role in the transmission of the disease.² The aetiologic agent is an environmental saprophyte and can be transmitted by percutaneous inoculation, inhalation and ingestion. The risk factors for disease acquisition are type II Diabetes Mellitus (DM), chronic alcohol use, chronic lung or renal disease and immune suppression.¹⁻³ The diagnosis is an enigma due to varied manifestations, lack of clinical suspicion and capabilities for conclusive identification.⁴ Early diagnosis is crucial for initiating appropriate chemotherapy as Melioidosis respond to only a limited number of antibiotics given over a prolonged period of time and to prevent the worsening of clinical outcome and relapse.⁵ We report two cases of Melioidosis with lower extremity involvement, an entity which was probably undiagnosed for long, at Port Blair, Andaman and Nicobar Islands.

Case I

A 48 years old male patient, working in the forest department was referred from district hospital with 2 weeks history of intermittent fever, chills, rigor, burning micturition and abdominal pain. Past history of Type II DM treated with oral hypoglycaemics since 10 years was elicited. On systemic examination there were no major findings. A provisional diagnosis of Urinary tract infection (UTI) with uncontrolled DM was made. On admission the patient had complained of pain in hip region and lower back. Tenderness was observed in the right sacroiliac joint with painful restricted movement

of right hip joint. Flexion and Straight leg raising test was painful at 45°C. On day 17 of admission, magnetic resonance imaging (MRI) showed - Osteomyelitic changes in right femur. The diagnosis was then changed accordingly and treatment started with ceftazidime and doxycycline. After 4 days of afebrile period, fever reappeared with persisting pain. Antibiotics were again changed to gentamicin and ceftriaxone. A repeat MRI showed no improvement on day 22. Surgical debridement was performed on day 28 and purulent exudate sent for culture and sensitivity yielded no growth of aerobic bacteria. The patient deteriorated on day 30 with features of septicaemia requiring admission to ICU. Blood culture sent on ICU admission, yielded colonies with metallic sheen on blood agar (Fig. 1) which was oxidase positive, bipolar stained pleomorphic gram negative bacilli (Fig. 2), colistin resistant and identified as *Burkholderia pseudomallei* by conventional method and confirmed by BD Phoenix System (BD, USA).

The patient continued to deteriorate and was referred to higher centre for further management. The outcome of the therapy is unknown as the patient was lost to follow up.



Fig. 1: Colonies of *Burkholderia pseudomallei* Blood agar

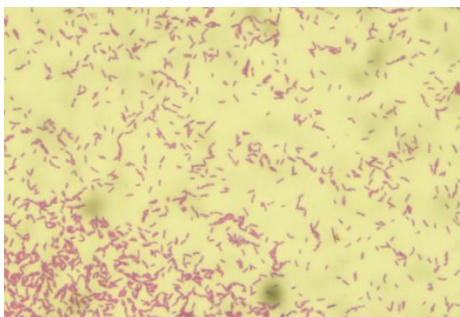


Fig. 2: Gram stain – Bipolar stained gram negative bacilli

Case II

A 61 years old male was brought to the emergency with complaints of high grade intermittent fever of 25 days, pain and swelling in left foot since 1 week. Past history was insignificant for any chronic illness. On per abdomen examination firm, tender hepatomegaly was present. Tenderness was noted in left foot. All laboratory investigation was within normal limit except for liver function tests and random blood glucose levels. A provisional diagnosis of Pyrexia of unknown origin (PUO) with left leg cellulitis with type II DM was made and the patient was started on oral hypoglycaemics and intravenous (IV) linezolid. On day 4 of admission, Ultrasound (USG) abdomen revealed enlarged liver, approximately 15.9 cm having two heteroechoic lesion with multiple septations in the right lobe, largest being 5.1 x 3.2cm. Intravenous amikacin, lower limb elevation and magnesium sulphate dressing was done. After initial improvement, patient deteriorated on day 10 of admission showing features of septicaemia and hence shifted to Intensive care unit (ICU). Abdominal USG showed enlarged liver, abscess in segment VI/VII with altered echotexturing of surrounding liver parenchyma. Blood culture sent upon admission to ICU yielded growth of bacterial colonies having metallic sheen on blood agar that was oxidase positive, bipolar stained gram negative bacilli resistant to colistin and identified as *Burkholderia pseudomallei* by conventional identification methods. This was further confirmed by automated BD phoenix system (BD, USA). The patient was then started on Meropenem and polymyxin B. Subsequently patient was referred to higher centre for further management.

Discussion

Burkholderia pseudomallei is a saprophyte bacterium with ability to survive in adverse soil and water condition for months to years.² Melioidosis is an endemic infectious disease in various tropical regions of the world, with highest incidence occurring in Thailand and northern Australia. It is also endemic in Vietnam, Laos, Malaysia, Indonesia and Singapore.^{4,7} A number of environmental and patient related host

factors have been implicated in literature from endemic areas. The environmental factors such as high rainfall and tropical climate have been associated with increased occurrence. Reports are also emerging from geographical areas beyond the traditionally reported areas like the Indian subcontinent. Many cases have been linked to occupational and recreational exposure to surface water, for example, rice paddy farmers in Thailand^{1,8,9} and outdoor work, landscaping and gardening in Australia.¹⁰ Diabetes mellitus is the most common predisposing risk factor and it increases the risk by 100 fold. The clinical manifestation varies from mild undifferentiated disease to life threatening deep seated abscess, pneumonia, septicaemia and disseminated disease with a high degree of mortality and morbidity.¹⁰ Bone and joint infection is rare but is an established entity. The most common joint affected is knee joint followed by ankle, hip and shoulder joint.^{1,6} Diabetes mellitus is an independent risk factor for bone and joint involvement.^{1,6,9} A high degree of suspicion is warranted for accurate diagnosis of osteomyelitis and septic arthritis.

Cases of Melioidosis are still being underreported due to the varied and confusing clinical manifestations. Many cases are reported from Southern India, although Melioidosis may be more widely prevalent in many parts of the country contrary to the popular perception.¹¹ The published reports are believed to represent just the tip of the iceberg.

Melioidosis may be missed due to lack of clinical awareness of this infection and limited laboratory training and correct microbiological diagnostic techniques. It is commonly misdiagnosed as *Pseudomonas* spp based upon oxidase positive, non lactose fermenting colony.¹¹ The routine clinical microbiology laboratory must characterize every isolate which is non-lactose fermenting, oxidase –positive, motile, gram negative bacilli with granular or safety pin appearance and colistin resistant, rather than dismiss as contaminants.¹² Knowledge of prevalence of this infection is necessary, as this would be useful in suspecting patients with typical/atypical presentations and initiating prompt therapy. Also a high index of clinical suspicion is required for the diagnosis where manifestation is obscure and treatment is ineffective.

The treatment of Melioidosis is prolonged and consists of intensive and eradication therapy. The intensive therapy constitutes parenteral administration of ceftazidime, cotrimoxazole amoxicillin clavulanic acid or meropenem as continuous IV infusion for a period of 4-8 weeks. Cotrimoxazole and doxycycline given over 6 months comprise the eradication therapy. The aminoglycoside's, penicillin's, cephalosporin's (first and second generations), polymyxin B, colistin, Rifamycins are considered ineffective for treatment of *B. pseudomallei* infections.^{13,14} Thus, a high degree of clinical suspicion for initiating appropriate therapy is

required. Limited awareness of the disease, confusion with other clinical conditions, wrong identification due to lab constraints of this clinical entity and lastly inappropriate antibiotic selection may lead to deterioration of the clinical condition and resulting in high morbidity.

Conclusion

For rapid and accurate diagnosis of Melioidosis a high index of suspicion is warranted in cases of persistent fever, PUO along with comorbid conditions like DM and good communication between the microbiologist and physicians is essential. Early diagnosis and initiation of appropriate treatment for complete cure and prevention of relapse is necessary for Melioidosis. Delay in diagnosis could adversely impact the outcome of disease or prove invariably fatal. The geographic location, environmental conditions and climate of Andaman & Nicobar Islands is conducive for the spread of the agent. Hence, the lab should be equipped to suspect and detect the cultures of *Burkholderia pseudomallei* precisely.

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