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Rare Case of Non-Resolving Bilateral Pneumonia with Septic Arthritis and Osteomyelitis

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Abstract

The diagnosis of melioidosis can be challenging due to its varied clinical presentation and its close resemblance to bacteria belonging to the genus pseudomonas. This case report detailed the clinical progression of a 38-year-old male patient diagnosed with diabetes who presented to our facility with intermittent fever, left knee pain, swelling in the lower limb for 20 days, and shortness of breath for one week. Initial CT and MRI imaging confirmed the presence of bilateral pneumonia and left knee arthritis with lower femur osteomyelitis. Acid fast bacilli (AFB) stain and aerobic culture test with left knee synovial fluid showed negative for tuberculosis. The blood culture demonstrated the presence of B. pseudomallei growth. The confirmation of positive blood culture for B. pseudomallei, in conjunction with the identification of radiological findings, firmly established the diagnosis of this uncommon disease in our case. Consequently, the patient was initiated on a treatment regimen of meropenem injections, followed by a course of trimethoprim-sulphamethoxazole for two weeks, and anticoagulant therapy for deep vein thrombosis (DVT). After a two-week hospital stay, the patient was discharged and continued treatment with trimethoprim-sulphamethoxazole and anticoagulants for a duration of three months. Subsequent follow-up confirmed the patient's complete recovery with no signs of recurrence.

Keywords: Burkholderia pseudomallei, bilateral pneumonia, melioidosis, osteomyelitis.

Introduction

Melioidosis is a bacterial infectious disease, caused by gram-negative obligatory aerobic non-spore forming bacillus, known as Burkholderia pseudomallei.[1] This organism is a soil saprophyte, commonly found in stagnant water and paddy fields.[2] Patients afflicted with diabetes mellitus, chronic renal failure, alcoholism, cirrhosis and immuno compromised conditions are at a heightened risk for melioidosis.[3] The clinical presentation of melioidosis encompasses a spectrum of manifestations, ranging from asymptomatic latent infection to localized cutaneous lesions, subacute pneumonia, bone and joint infections, abscesses within body organs and cranial abscesses, which can escalate to life-threatening septicemia.[4] Bone and Joint Infection (BJI) resulting from the bacterium B.pseudomallei, includes septic arthritis and osteomyelitis. These conditions represent rare but serious infection that can lead to adverse outcomes.[5] Melioidosis presents with a variety of clinical symptoms, many of which are similar with other bacterial infections such as pyogenic bacterial infection and tuberculosis.[6] Its diagnosis requires a combination of history findings, clinical features, radiological and microbiological confirmation.[5]

Here, we report the successful treatment of an adult man infected with B.pseudomallei and presented in our department with bilateral pneumonia, septic arthritis and osteomyelitis.

Case Presentation

A 38-year-old male with a previous history of diabetes and uncontrolled sugars has presented in our department with complaints of fever on and off for 45 days, left knee pain for 30 days, left lower limb swelling for 20 days and breathlessness for one week. An external evaluation of CT thorax revealed bilateral consolidation and MRI scan of knee showed, marrow edema in distal femur, focal minimal cortical thinning at anterior aspect of distal femur with no subperiosteal collection representing femur osteomyelitis. Results also revealed, suprapatellar effusion with synovial thickening in suprapatellar recess and in intercondylar region suggesting synovitis, ill-defined hyperintensity which is not liquified in medial and lateral head of gastrocnemius likely myositis and also loss of normal flow void of popliteal vein suggesting deep venous thrombosis. Bronchoalveolar lavage (BAL) sample showed klebsiella infection and was treated with antibiotics. Patient came to us in view of non-resolving symptoms like high grade fever, hypoxia and hypotension. He was started on vasopressor and noninvasive ventilation (NIV) support. Repeat chest X-ray showed worsening of bilateral consolidation (Fig 1A). As patient had chronic symptoms with multi systemic involvement differentials of tuberculosis, severe septicemia, infective endocarditis and melioidosis were suspected. Patient continued on broad spectrum antibiotics and supportive treatment. Patient evaluated further examination. 2DECHO was within normal limits. The left knee synovial fluid was found negative for the AFB stain and aerobic culture suggesting that the patient does not have tuberculosis. Synovial biopsy showed features of acute suppurative inflammation. Sputum evaluation was not contributory. Doppler studies showed left lower limb deep vein thrombosis (DVT). Blood culture showed positive for B.pseudomali resistant to Ceftazidime, Levofloxacin, Chloramphenical, Minocycline and sensitive to Meropenem, trimethoprim-sulphamethoxazole. The microbiological and radiological findings confirmed the diagnosis of melioidosis.

Patient was treated with Inj Meropenem (IV 2 gm thrice daily for 14 days) , Tab trimethoprim-sulphamethoxazole (Oral, 800 mg sulfamethoxazole and 160 mg trimethoprim Once daily, for 14 days) and anticoagulants

for deep vein thrombosis(DVT). Patient was clinically improved, noninvasive ventilation (NIV) weaned off slowly. Patient found hemodynamically stable without any fever spikes. With a Glasgow Coma Scale (GCS) score of E4VTM5 and 98% SpO2, he was discharged from the hospital after two weeks and treated with trimethoprim - sulphamethoxazole (Oral, 800 mg sulfamethoxazole and 160 mg trimethoprim Once daily) and anticoagulants for three months. Follow up chest X-ray (1B) after three months showed complete resolution of bilateral consolidation and clinical improvement in left knee swelling with patient able to mobilize without difficulty.

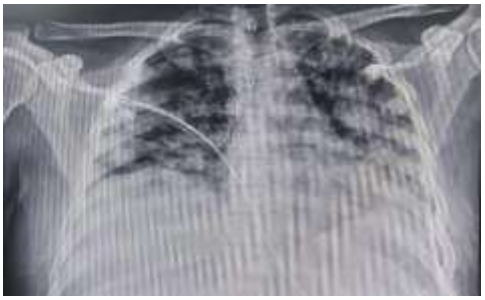

Figure 1: A) Chest x-ray posterior–anterior view after 2 weeks of treatment showing improvement

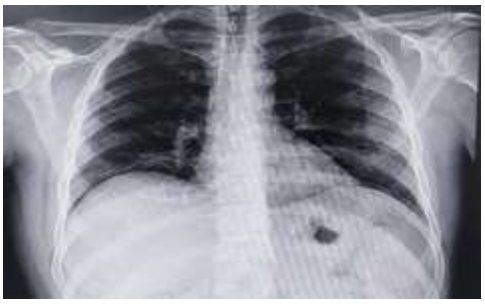

Figure 1: B) Follow-up chest X-ray posterior–anterior view after 3 months of treatment showing significant improvement.

Discussion

Melioidosis, a disease caused by the soil and water bacterium Burkholderia pseudomallei is endemic to tropical regions. India's rural population lives in close proximity to agricultural land and is quite susceptible to this neglected deadly disease. However, it is under reported in India because of lack of awareness, a low index of suspicion among health care providers, and an under-recognition of the disease symptoms and severity.[7] Recent research has indicated a rise in the incidence of melioidosis cases diagnosed in India, attributed to advancements in microbiological diagnostic methods and the utilization of polymerase chain reaction (PCR) based diagnostics.[8]

Risk factors for acquiring B.pseudomallei infection includes exposure to soil or water, diabetes mellitus, thalassemia, excessive alcohol intake, chronic lung diseases, renal disorders, systemic lupus erythematosus, and being the male.[9] Our patient had diabetes mellitus; this might have been the source of his melioidosis. Nonetheless, it should be noted that melioidosis can also be induced through ingestion, inhalation, and laboratory-acquired infection.[10]

There is considerable variation in the disease clinical manifestation; in the early stages, it often presents as asymptomatic or with a low-grade fever and cough. Since our patient had intermittent fever, it's likely that he was unaware that he was ill. It is therefore likely that the patient put off getting medical help because of a lack of knowledge and ignorance about the illness. It is known that the incubation period for a B. pseudomallei infection can last anywhere from few days to several years.[11] In our patient who is a male, the time from onset of symptoms to diagnosis was approximately 1.5 months. B.pseudomallei has been identified as an emerging infectious agent in India and research indicated that the majority of affected individuals are males originating from rural regions.[12]

Pneumonia is the most predominant symptom of the melioidosis, followed by genitourinary infection, skin and soft tissue infection.[13] Melioidotic osteomyelitis and septic arthritis are the frequently-recognized presentation

of melioidosis, sometimes also named rheumatological melioidosis involving one or more of joint, bone or muscle.[14,15] In the current study the patient developed symptoms like osteomyelitis, septic arthritis and bilateral pneumonia which are consistent with the findings from previous studies. In 93.2% of infected cases, blood sample is the most frequent clinical sample from where B.pseudomallei was isolated.[16] Positive blood culture of B.pseudomallei together with the radiological findings mainly computed tomography (CT) and magnetic resonance imaging (MRI) strongly suggested this rare disease in our case.

The management of melioidosis necessitates extended course of suitable antibiotics due to the recalcitrant nature of the infection. A preliminary intensive phase should include at least 10 to 14 days of intravenous ceftazidime or meropenem subsequently followed by oral therapy, which comprises administration of trimethoprim - sulfamethoxazole (TMP-SMX) taken every 12 hours for 3 to 6 months, either in isolation or in conjunction with doxycycline.[17] The combination of TMP-SMX and doxycycline is widely used as the standard oral regimen as a suitable treatment. However, a recent study has indicated that TMP-SMX administered alone does not demonstrate inferiority to TMP-SMX in conjunction with doxycycline.[18] Amoxicillin-clavulanate may serve as an alternative therapeutic option for eradication therapy in instances where there are contraindications associated with the utilization of TMP-SMX.[19] In our case also, the patient was initially administered with IV meropenem and trimethoprim-sulphamethoxazole orally for a duration of two weeks. Additionally, anticoagulants were taken to prevent deep vein thrombosis (DVT). Following discharge, the patient continued to receive treatment with trimethoprim - sulphamethoxazole and anticoagulants for a period of three months, without using any alternative medications. Our patient exhibited a favorable response to the prescribed antibiotic therapy. Upon discharge, he was asymptomatic, ambulant and recommended with a prolonged course of treatment. With prompt diagnosis and treatment this rare melioidosis with high fatality rate is being treated successfully. A detailed travel history to endemic areas and a high level of suspicion among clinicians and microbiologists are required for the diagnosis of melioidosis. It is significant to remember that certain melioidosis cases can arise even in the absence of known risk factors. The prevention of deadly consequences depends on early detection. The time has come to initiate an effective surveillance system that would provide more information about the clinical characteristics and distribution of this disease within nonendemic areas, such as India.

Conclusion

Diabetes is now recognized as a significant risk factor for melioidosis, an infectious disease that is on the rise in India. A better understanding of the geographical distribution of the organism and to augment awareness among healthcare workers is crucial to address this disease. Maintaining a high index of suspicion, coupled with swift diagnosis and initiation of treatment, is essential in mitigating mortality rates associated with this condition.

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