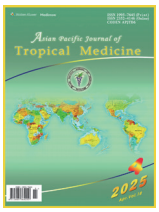

Case Report

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Melioidosis in kidney transplant recipients: A report of two cases

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ABSTRACT

Rationale: Melioidosis is a serious opportunistic infection caused by *Burkholderia* (*B.*) *pseudomallei*, primarily affecting immunocompromised individuals, particularly in endemic regions. Timely diagnosis and appropriate treatment are crucial to prevent fatal outcomes.

Patient concerns: Case 1 was a 34-year-old male kidney transplant recipient who presented with a 15-day history of intermittent fever, accompanied by liver and spleen abscesses. Case 2 was a 37-year-old female kidney transplant recipient who presented with acute febrile illness and developed leucopenia. Blood cultures for both patients grew *B. pseudomallei*.

Diagnosis: Both patients were diagnosed with melioidosis caused by *B. pseudomallei*, with the diagnosis confirmed through pus culture from the liver abscess in Case 1 and blood culture in Case 2.

Interventions: Both patients were treated with an intensive regimen of meropenem (renal-adjusted doses), followed by a 3-month course of oral cotrimoxazole for eradication therapy.

Outcomes: Case 1 experienced resolution of liver and spleen abscesses after 3 months of treatment and continued to recover well. In Case 2, blood cultures became sterile after 4 weeks, with no further complications observed.

Lessons: Melioidosis should be suspected in immunocompromised patients, especially kidney transplant recipients, who present with unexplained fever and sepsis-like symptoms. Early diagnosis through aspiration of abscesses and prompt treatment are critical for preventing relapses and improving patient outcomes.

KEYWORDS: Kidney transplant; Melioidosis; Deep seated abscess; Disseminated infection; Meropenem; Cotrimoxazole

1. Introduction

Melioidosis is a diverse clinical illness caused by the Gram-negative bacterium *Burkholderia* (*B.*) *pseudomallei*. The tropical areas of Southeast Asia and northern Australia are recognized as endemic regions for melioidosis, where annual incidence rates have been reported to reach up to 50 cases per 100 000 population[1]. Its geographical spread now encompasses the Indian subcontinent, Sri Lanka, China, Korea, Mauritius, Madagascar, and several countries in Africa. Sporadic cases and clusters have also been documented in the Americas[2]. It is likely that the actual incidence of this disease is underestimated due to insufficient clinical suspicion and challenges in microbiological identification. It has been sporadically documented in the Indian subcontinent, and in 2003, George *et al.* have reported the first case of melioidosis in kidney transplant recipient in India, from our institution, marking a significant milestone in global medical literature[3]. Melioidosis is increasingly recognized as an opportunistic infection among vulnerable individuals in endemic regions, posing a significant risk of mortality if diagnosis and treatment are delayed or inadequate. Timely initiation of appropriate antimicrobial therapy is crucial

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in preventing fatal outcomes. In this report, we describe two cases of melioidiosis in kidney transplant recipients occurred during the period from 2015 to 2023.

2. Case presentation

A 34-year-old male with unknown native kidney disease underwent deceased donor kidney transplantation in 2016, received anti-thymocyte globulin induction followed by maintenance immunosuppression with prednisolone, tacrolimus, and mycophenolate. He did not experience post-transplant infections such as cytomegalovirus infection, BK virus nephropathy, urinary tract infections nor other complications like diabetes. However, after 4 years, he presented with a 15-day history of fever, without localized symptoms or signs, and no history of occupational exposure or recent travel. Initial evaluation revealed anaemia and thrombocytopenia, with stable graft function (serum creatinine 1.3 mg/dL), sterile blood cultures, normal blood sugars. Ultrasound abdomen showed no abnormality. He was empirically treated and discharged but was readmitted a month later with intermittent fever of 39.4 ℃. Further evaluation *via* contrast-enhanced computed tomography of the abdomen revealed multiple evolving abscesses in the liver and spleen as depicted in Figure 1 (A, B and C). Ultrasound-guided aspiration of a liver abscess yielded pus that grew *B. pseudomallei*. At the time of infection, his tacrolimus trough level was 5.4 ng/mL, and mycophenolate area under the curve level was 38.9 mg h/L.

A 37-year-old woman, with native kidney disease due to immunoglobulin A nephropathy, underwent live related donor ABO compatible kidney transplantation in 2018. She received basiliximab induction followed by maintenance immunosuppression with prednisolone, tacrolimus and mycophenolate initially for three months. Subsequently, mycophenolate was stopped due to persistent severe leucopenia. 6 months post transplant, she presented with a history of acute febrile illness without localising symptoms and signs and no history of occupational exposure or recent travel. On evaluation, she had leucopenia, stable graft function with serum creatinine of 1.5 mg/dL, normal chest and abdomen imaging. The tacolimus trough level (Co) was 6.7 ng/mL at the time of infection. Her blood culture grew *B. pseudomallei*.

Both patients received an intensive regimen with renal-adjusted doses of injection. Meropenem one gram intravenously every eight hours for 6 weeks in first patient and 4 weeks in the second patient (stopped after demonstrating no growth of *B. pseudomallei* in blood cultures). Both patients subsequently started on eradication therapy with oral cotrimoxazole (160 mg trimethoprim and 800 mg sulfamethoxazole) two tablets twice daily for 3 months. At 3 months, the repeated imaging showed resolution of the abscesses in the first patient and in the second patient repeat blood cultures were sterile at the end of 4 weeks.

3. Discussion

Melioidosis can affect both humans and various animals, and is

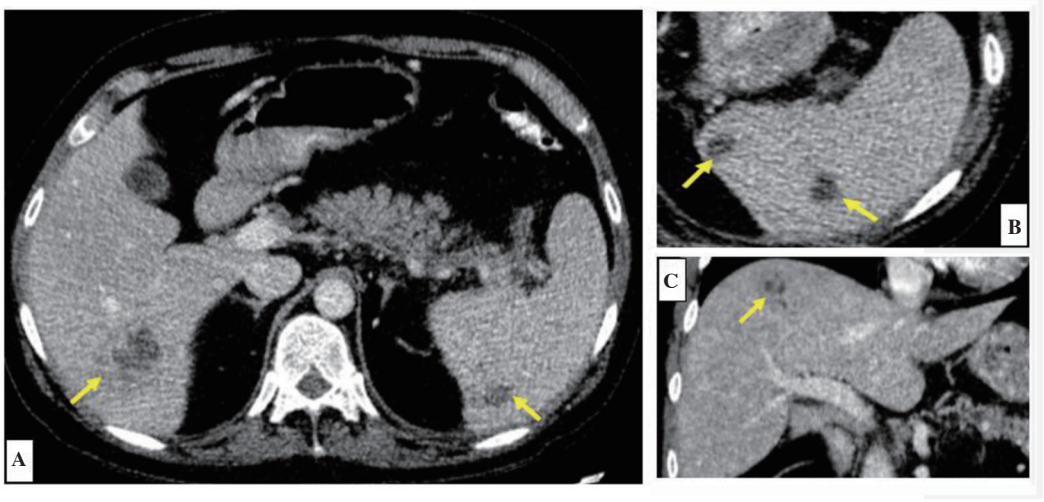

Figure 1. Computed tomography axial (A and B) and coronal (C) sections. Arrows indicate multiple clusters of partially liquefied thick walled abscesses in the liver (largest in segment 6 measures 2.5 to 3.0 cc) and spleen observed in a 34-year-old male presented with a 15-day history of fever 4 years after kidney transplantation.

typically transmitted through percutaneous inoculation, inhalation, and ingestion. Percutaneous inoculation, leading to bacterial seeding, is widely regarded as the primary mode of transmission, although the inhalation of aerosolized bacteria is also recognized as significant. Numerous cases have been linked to occupational activities, including rice farming and outdoor work such as garden maintenance, landscaping, and various trades. Additionally, instances of melioidosis have been reported in connection with sporting activities held on wet, muddy sports fields. Diabetes mellitus, along with hazardous alcohol consumption, chronic kidney disease, and chronic lung disease, have been identified as a significant independent risk factor for melioidosis[4,5]. In endemic regions, the use of high-dose prednisolone and/or other immunosuppressive therapy has been linked to an elevated risk of melioidosis in 6%-12% of cases[6].

Melioidosis has been previously documented in renal transplant recipients, presenting as septic arthritis and urinary tract infection, respectively[7]. The most common presentation of melioidosis is community-acquired pneumonia, occurring in over half of all cases in most case series. In the Darwin prospective study, which encompassed 540 documented cases of melioidosis over a 20-year period, pneumonia emerged as the most frequent primary presentation, accounting for 51% of cases, while isolated bacteremia in 11%, deep visceral abscesses and secondary foci in the lungs or joints were prevalent among affected individuals[8]. In a recent prospective study from South India by Raj S *et al*[9], the most frequent presentation was sepsis (47.1%), followed by skin and soft tissue infection (32.9%) and pneumonia (25.7%) with a mortality rate of 50%. However, our first patient had liver and splenic abscesses and the second patient had isolated bacteremia.

In non-critically ill patients without central nervous system involvement, the drug of choice for the treatment of melioidosis is meropenem (25 mg/kg up to 1 g) administered intravenous every 8 h or ceftazidime (50 mg/kg up to 2 g) intravenous every 8 h[10]. Initial intensive intravenous antibiotic therapy is typically administered for a minimum of 14 days, a duration largely aligned with the protocols observed in clinical trials focusing on the treatment of melioidosis. However, longer durations, extending to at least four to eight weeks may be necessary in specific scenarios like critical illness, extensive pulmonary disease, deep-seated collections or organ abscesses, osteomyelitis, septic arthritis, or neurological involvement. Eradication therapy with 3-6 months aims to kill any residual bacteria and minimize the risk of relapse.

Neither of our patients had a history of occupational exposure or recent travel, and no other risk factors like diabetes or alcohol consumption. However, both of them had chronic kidney disease, with an average dialysis vintage of 2.2 years prior to kidney transplantation, which is reported as one of the risk factors of melioidosis. It is plausible that environmental exposure combined with their immunosuppressive state played a role in the development of melioidosis in our patients. Fortunately, both patients responded well to treatment, maintaining stable graft function without any mortality.

In conclusion, there is no singular diagnostic test available for detecting rare infections such as melioidosis. Initial cultures and imaging may yield negative results, as observed in our first patient. Therefore, maintaining a high index of suspicion, particularly in immunocompromised patients, is crucial. Aspiration of deep-seated pus can prove invaluable in establishing a diagnosis. Providing the appropriate medication and ensuring the correct duration of intensive treatment, followed by eradication therapy, are pivotal for effectively treating melioidosis and preventing potential relapses.

Conflict of interest statement

The authors declare that they have no conflict of interest.

Ethical approval and patients' consent

Written informed consents were obtained from the patients for publication of this case report and any accompanying images.

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Authors' contributions

CR: Conceptualization, methodology, case analysis, data collection, writing original draft; JV: Provided radiological images and explanation for images; UM: Literature review, data analysis, and manuscript revision; JJE: Patient care and management, clinical data collection, and manuscript revision; AT&EEJ: Data interpretation, and manuscript revision; ATV: Reviewing, and editing the manuscript; SA: Supervision of clinical aspects and case formulation; VGD: Contribution to the case discussion and interpretation of results; JSM: Provided microbiological aspects of melioidosis; SV: Final manuscript approval and critical review of the work.

References

[1] Limmathurotsakul D, Wongratanacheewin S, Teerawattanasook N, Wongsuvan G, Chaisuksant S, Chetchotisakd P, et al. Increasing incidence of human melioidosis in Northeast Thailand. *Am J Trop Med Hyg* 2010; **82**(6): 1113-1117. doi: 10.4269/ajtmh.2010.10-0038.

[2] Wiersinga WJ, Currie BJ, Peacock SJ. Melioidosis. *N Engl J Med* 2012; **367**: 1035-1044.

[3] John TG, Jesudason MV, Lalitha MK, Ganesh A, Mohandas V, Cherian T, et al. Melioidosis in India: The tip of the iceberg? *Indian J Med Res* 1996; **103**: 62.

[4] Suputtamongkol Y, Chaowagul W, Chetchotisakd P, Lertpatanasuwun N, Intaranongpai S, Ruchutrakool T, et al. Risk factors for melioidosis and bacteremic melioidosis. *Clin Infect Dis* 1999; **29**: 408-413.

[5] Mardhiah K, Wan-Arfah N, Naing NN, Hassan MRA, Chan HK. Comparison of Cox proportional hazards model, Cox proportional hazards with time-varying coefficients model, and lognormal accelerated failure time model: Application in time to event analysis of melioidosis patients. *Asian Pac J Trop Med* 2022; **15**(3): 128-134.

[6] Malczewski AB, Oman KM, Norton RE, Ketheesan N. Clinical presentation of melioidosis in Queensland, Australia. *Trans R Soc Trop Med Hyg* 2005; **99**: 856-860.

[7] Varughese S, Mohapatra A, Sahni R, Balaji V, Tamilarasi V. Renal allograft recipient with melioidosis of the urinary tract. *Transpl Infect Dis* 2011; **13**: 95-96.

[8]Sullivan RP, Marshall CS, Anstey NM, Ward L, Currie BJ. 2020 Review and revision of the 2015 Darwin melioidosis treatment guideline; paradigm drift not shift. *PLoS Negl Trop Dis* 2020; **14**(9): e0008659.

[9]Raj S, Sistla S, Sadanandan DM, Kathirvan T, Rameesh BM, Amalnath D. Clinical profile and predictors of mortality among patients with melioidosis. *J Global Infect Dis* 2023; **15**: 72-78.

[10]Dance D. Treatment and prophylaxis of melioidosis. *Int J Antimicrob Agents* 2014; **43**: 310-318.

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