Case Report

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A Rare Presentation of Whitmore's Disease (Melioidosis) with Multisystem Abscess in a Diabetic Patient with Intractable Hiccups

Internal Medicine Section

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ABSTRACT

Whitmore's disease (Melioidosis) is caused by *Burkholderia pseudomallei* (*B. pseudomallei*), a gram-negative bacterium with high pathogenicity. The disease manifests in various forms, ranging from pneumonia or localised abscesses to acute septicaemia or arthritis. Culture and sensitivity tests are the gold standards for diagnosis. For treatment, ceftazidime or meropenem is recommended during the intensive phase (10-14 days), while oral co-trimoxazole is the drug of choice for the eradication phase (3-6 months). Surgical drainage of abscesses plays an important role in the management of melioidosis. However, the occurrence of multisystem abscesses is very rare. Hereby, authors report a case of a 63-year-old female with a known history of diabetes who presented with fever and hiccups for 40 days, deranged liver function tests, and leukocytosis. A Computed Tomography (CT) scan revealed lung and liver abscesses, and the culture yielded *B. pseudomallei*. The patient was diagnosed with melioidosis, treated with antibiotics, and subsequently discharged.

Keywords: *Burkholderia pseudomallei*, Diabetes mellitus, Meropenem, Multiple abscess

CASE REPORT

A 63-year-old female with a known history of Type II Diabetes Mellitus (DM) for 10 years was brought to the Emergency Medicine Department (EMD) with complaints of intermittent low-grade fever associated with chills and intractable hiccups for the past 40 days. These symptoms were accompanied by decreased physical activity over the past 10 days. She had a history of giddiness, described as a self-spinning type, not associated with blurring of vision, diplopia, tinnitus, or postural variation. There was no history of headaches or loss of consciousness. The patient experienced a fall due to giddiness, resulting in an injury to the left forearm, which was diagnosed as a displaced fracture of the left radial head. Orthopaedic consultation was obtained, and a cast was advised. There was no history of recent travel or exposure to agriculture, dust, or any other form of animal handling. Additionally, there was no history of tuberculosis or recurrent infections.

On clinical examination, the patient was conscious and oriented, with pallor and severe dehydration noted. She presented with tachycardia {Heart Rate (HR) of 130 beats per minute}, Blood Pressure (BP) of 120/80 mmHg, temperature of 100.4°F, Respiratory Rate (RR) of 30/minute, Capillary Blood Glucose (CBG) of 238 mg/dL, an SpO_2 of 96% on two liters of oxygen and a Glasgow Coma Scale (GCS) score of 15/15. A systemic examination of the Respiratory System (RS), Cardiovascular System (CVS), Central Nervous System (CNS), and abdominal examination was performed and found to be normal. The patient was immediately admitted for further investigations [Table/Fig-1].

The patient was started on intravenous (i.v.) fluids immediately. A few hours later, she complained of chills. Upon examination, she was drowsy; her HR was 140 bpm, and her RR was 42 breaths per minute. RS examination revealed bilateral crepitations in the infra- and interscapular regions, for which diuretics were given, and the patient was started on Non Invasive Ventilatory (NIV) support. A few hours later, her BP dropped further, and she was started on i.v. Noradrenaline. She was provisionally diagnosed with septic shock and acute liver injury, with differential diagnoses including sepsis (suspected urosepsis), hypovolemia and hyponatremia.

Test	Results (Day 1)	Normal values
Complete blood profile		
Total counts (WBC) (cells/mm^3)	14700	4000-11000
Platelets (mm^3)	92000	150000-450000
Electrolytes		
Sodium (Na+) (mEq/L)	114	135-145
C-reactive protein (CRP) (mg/L)	169.64	<10
Erythrocyte Sedimentation Rate (ESR) (mm/hour)	130	<20
Procalcitonin (ng/mL)	70	<0.05
HbA1c (%)	11	<5.7
Liver function test		
Albumin (g/dL)	2.4	3.5-5.2
AST (SGOT) (U/L)	114	8-48
ALT (SGPT) (U/L)	57	7-55
Urine routine		
Reaction	Acidic	
pH	6.0	
Albumin and sugar	Nil and trace	
Pus cells	5-6 High Power Filed (HPF)	
Bacteria	Occasional	
Epithelial cells	2-4	
RBC, casts, crystals	Nil	

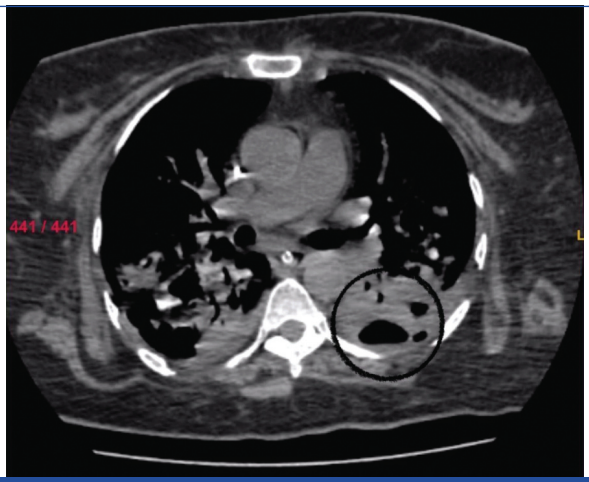
[Table/Fig-1]: Abnormal baseline laboratory investigations on admission day.

In view of the sepsis, blood and urine samples were sent for culture and sensitivity testing, with the blood samples inoculated into BacT alert bottles. Once flagged, the bottles were subcultured on sheep blood agar plates and MacConkey agar plates. The growth was then identified using the Vitek-2 compact machine, an automated method for identification and Antimicrobial Susceptibility Testing (AST). Without delay, the patient was started on i.v. cefoperazone-sulbactam, i.v. paracetamol as an antipyretic, subcutaneous insulin and other supportive medications in the EMD. The patient was immediately shifted to the Cardiac Care Monitoring unit (CCM)

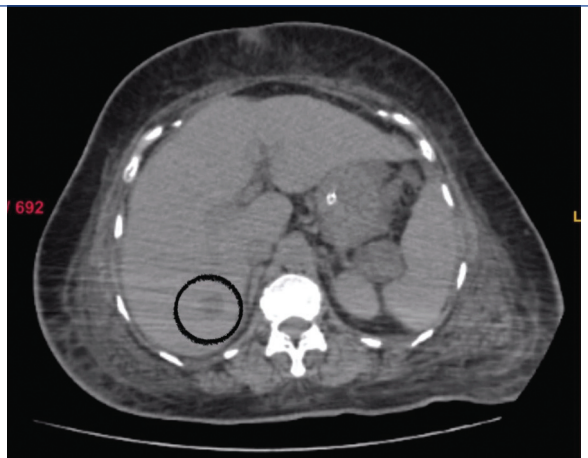
on the day of admission, and the antibiotics were escalated to i.v. Piperacillin-Tazobactam (PIPTAZ).

The culture and sensitivity report of the urine showed the presence of *Escherichia coli* (*E. coli*) with a colony count of 10^5 CFU/mL and sensitivity to nitrofurantoin, gentamicin and meropenem, with intermediate resistance to cefoperazone/sulbactam and amikacin. Meanwhile, the blood culture revealed *B. pseudomallei*, which was sensitive to ceftazidime, meropenem, cefoperazone-sulbactam and trimethoprim-sulfamethoxazole. Consequently, the patient's antibiotics were escalated to i.v. meropenem (2 g TDS), along with i.v. doxycycline (100 mg BD) and oral co-trimoxazole (160/800 mg BD). A repeat urine routine showed yeast cells, prompting the initiation of i.v. fluconazole (200 mg OD for 10 days).

Three days later, the patient was intubated due to persistent tachypnoea and impending respiratory arrest. A CT scan of the thorax [Table/Fig-2] showed a few lesions in the superior basal segment of the left lower lobe, suggestive of an abscess. Furthermore, a CT scan of the abdomen revealed a hepatic abscess. A surgical opinion was obtained, and a Contrast-Enhanced CT (CECT) scan of the abdomen [Table/Fig-3] was advised. Due to difficulty in weaning off ventilator support, a tracheostomy was performed, and in view of anaemia, one unit of packed Red Blood Cells (pRBC) was transfused. A repeat endotracheal tube culture revealed *Acinetobacter baumannii*, which was resistant to all tested antimicrobial agents (multidrug resistant). Despite this, the patient was continued on the same antibiotics for 15 days based on clinical judgment and the lack of alternative options.



[Table/Fig-2]: CT thorax of the patient showing lung abscess. (A lung abscess typically appears as a well-defined, round or oval cavity with an air-fluid level, surrounded by dense tissue).



[Table/Fig-3]: CECT abdomen showing liver abscess. (A liver abscess appears as a hypodense (*darker*) lesion, possibly with irregular or ring-like enhancement on imaging).

The patient symptomatically improved and was then shifted to the ward. An Echocardiography (ECHO) was performed, which showed concentric Left Ventricular Hypertrophy (LVH) with no Regional Wall Motion Abnormalities (RWMA) and an Ejection Fraction (EF) of 60%, along with positive Diastolic Dysfunction (DD). An infectious disease specialist was consulted and recommended i.v. meropenem (2 g) for four weeks and oral co-trimoxazole (160/800 mg) for three months. The patient was monitored in the ward and continued with daily chest physiotherapy, with frequent suctioning performed. A repeat CT scan was done to check on the abscess, and it was found to have resolved. The patient became symptomatically better and was started on oral fluids after an ENT consultation. The patient was discharged with instructions to continue i.v. meropenem for four weeks and to attend regular follow-up visits every two weeks for tracheostomy care and diabetes management.

During the follow-up, the patient demonstrated significant clinical improvement, with proper healing of the tracheostomy site, effective diabetes control and no recurrence of infection. The patient was clinically stable at the end of the treatment course.

DISCUSSION

Whitmore's disease (Melioidosis) is an infectious disease caused by the gram-negative bacterium *B. pseudomallei* [1,2]. The bacteria enter the body through wounds, inhalation, or ingestion following contact with contaminated soil or water [1,3,4]. It is an emerging infection in Asian countries and is endemic in Southeast Asian countries and northern Australia [2,3,5]. Although the incidence peaks between the ages of 40 to 60 years, the disease can also affect children (<5%) [2]. In India, the first case was reported by Raghavan KR et al., from Mumbai in 1991 [6]. Globally, approximately 165,000 people are diagnosed with melioidosis every year and mortality rates vary from 9-70% [3,7,8]. Affected patients present with symptoms of sepsis (predominantly fever), with or without pneumonia, localised abscesses, or other foci of infection [9]. The signs and symptoms resemble those of tuberculosis, making misdiagnosis common [3,10,11]. Moreover, it is a non notifiable disease in India, and since it is not included by the National Centre for Disease Control (NCDC) in the Integrated Disease Surveillance Program (IDSP), it poses difficulties for clinicians in diagnosing the disease at an early stage; thus, it is often considered an underdiagnosed disease [8].

The DM is one of the most common predisposing factors for this disease, leading to an immunocompromised state [4]. Vidyalakshmi K et al., found a correlation of 76% between DM and melioidosis and postulated that diabetes significantly increases the chances of mortality [12]. Similarly, a case report by Patil C et al., highlighted the occurrence of melioidosis in patients with DM [13]. The organism possesses a special capacity to interact with human insulin, which is the basis of a significant biological and clinical interaction with implications for DM [4,5]. In this case, the patient was diagnosed with T2DM for more than 10 years, which was one of the predisposing factors for melioidosis.

The organism is easily isolated from tropical environmental niches and sources such as rice paddies, still or stagnant waterways, and soil, where it serves as the main reservoir [5]. Melioidosis is transmitted via inoculation of compromised surface tissues with soil and water. Although its incubation period is not clearly defined, it might range from two days to as long as 26 years [5]. From acute fulminant septicaemia to a persistent, debilitating localised infection, it manifests as a febrile disease [2,3,5]. In the present case, the patient presented with febrile illness for more than 40 days and, notably, intractable hiccups, which were new and unusual symptoms that warranted consideration of varied differential diagnoses. These might include infectious causes due to systemic inflammation by *Burkholderia pseudomallei*, gastrointestinal irritation such as Gastroesophageal Reflux Disease (GERD) caused by a hepatic abscess irritating the phrenic nerve or diaphragm, metabolic disorders including encephalopathy secondary to sepsis or liver dysfunction, electrolyte disorders affecting the neuromuscular control of the diaphragm, or CNS lesions [14,15]. Moreover, the

patient's condition started to deteriorate slowly, leading to a diagnosis of sepsis.

Burkholderia pseudomallei causes abscess formation in various organs of the body, including the liver, lungs, prostate and soft-tissue [3,5,10,16]. Thus, early diagnosis and treatment are crucial. Similarly, in present case, the patient had multisystem abscesses in the lungs and liver, identified through a CT scan, followed by deranged LFTs, which prompted us to conduct blood cultures. In Bangladesh, Khan MR et al., also reported multiple abscesses with fulminant sepsis, similar to present case findings [17]. The cultures resulted in the identification of *B. pseudomallei*, leading us to treat the patient promptly with appropriate antibiotics. Therefore, culture is regarded as the gold standard diagnostic test for melioidosis.

This gram-negative bacillus can be identified with bipolar staining by taking a sample of the patient's pus, sputum, or wound. Additionally, the organism grows preferentially on Ashdown's medium and can thrive on a wide range of growth media, such as those used for catalase and oxidase tests [18,19].

The treatment for melioidosis consists of two phases: the i.v. intensive phase, followed by the eradication phase. The drug of choice for treating this disease is meropenem, as it is the preferred antimicrobial agent in severe cases due to its low minimum inhibitory concentrations, excellent intracellular penetration and tolerable side-effect profile [2,5,20]. Alternate drugs include imipenem, amoxicillin/clavulanic acid and ceftazidime, though no differences have been demonstrated between these drugs [2,4,5,9]. Another possibility is cotrimoxazole, which should be maintained for the duration of the intensive phase of treatment. Later, it can be changed to oral administration and is highly recommended for the oral eradication phase, starting at least three months following the intensive phase [2,5,9]. In present case the AST showed sensitivity to ceftazidime, meropenem, cefoperazone/sulbactam and trimethoprim/sulfamethoxazole. Hence, the patient was started on the following injections: meropenem, doxycycline and cotrimoxazole as the treatment course. Surgical drainage plays an important role in the management of melioidosis if an abscess is present [2,5,6,10].

Regarding recurrence, if the entire course of treatment is completed, the likelihood of a returning infection is 10%. However, for those who do not complete the full course of treatment, the relapse rate can reach 30%. About 4% of latent infections may become reactivated into active illness. Relapses may present as severe acute illness with potentially lethal consequences [2,9]. Hence, the patient needs to be monitored meticulously to avoid relapse and further complications.

CONCLUSION(S)

Melioidosis is an underdiagnosed infection in India, often due to its non specific presentation and a low index of suspicion among clinicians. Restricted laboratory resources to isolate the organism and a lack of knowledge about the disease can contribute to the misdiagnosis of this condition. This report highlights the importance of considering melioidosis in patients presenting with prolonged febrile illness, especially key clinical features such as multiorgan abscesses and unusual symptoms like intractable hiccups. Patients with diabetes mellitus or exposure to endemic regions should prompt clinicians to include *B. pseudomallei* as a differential diagnosis. Early diagnosis through culture and sensitivity testing, combined with timely initiation of appropriate antibiotics, is crucial in preventing complications and reducing mortality. This case underscores the importance of clinical awareness and prompt management of this rare but potentially life-threatening infection.

REFERENCES

[1] White N. Melioidosis. The Lancet. 2003;361:1715-22. Doi: 10.1016/s0140-6736(03)13374-0.
[2] Chowdhury FR, Jilani MSA, Barai L, Rahman T, Saha MR, Amin MR, et al. Melioidosis in Bangladesh: A clinical and epidemiological analysis of culture-confirmed cases. Trop Med Infect Dis. 2018;3:40. Doi: 10.3390/tropicalmed3020040.
[3] Limmathurotsakul D, Dance DAB, Wuthiekanun V, Kaestli M, Mayo M, Warner J, et al. Systematic review and consensus guidelines for environmental sampling of *Burkholderia pseudomallei*. PLoS Negl Trop Dis. 2013;7:e2105-e2105. Doi: 10.1371/journal.pntd.0002105.
[4] Ahmed T, Mollah MAH, Mohsin F, Nahar J, Talha A. Melioidosis in a patient with type i diabetes mellitus - A case report. Bangladesh J Child Health. 2018;42:46-48. Doi: 10.3329/bjch.v42i1.37052.
[5] Cheng AC, Currie BJ. Melioidosis: Epidemiology, pathophysiology, and management. Clin Microbiol Rev. 2005;18:383-416. Doi: 10.1128/CMR.18.2.383-416.2005.
[6] Raghavan KR, Shenoi RP, Zaer F, Aiyer R, Ramamoorthy P, Mehta MN. Melioidosis in India. Indian Pediatr. 1991;28:184-88.
[7] Gassiep I, Armstrong M, Norton R. Human melioidosis. Clin Microbiol Rev. 2020;33:e00006-19. Doi: 10.1128/CMR.00006-19.
[8] Dubey DK, Bano N, Dubey M, Sangwan P, Mitra SK, Kulshrestha V, et al. A case series of melioidosis: An underdiagnosed infection. ID Cases. 2023;31:e01685. Doi: 10.1016/j.idcr.2023.e01685.
[9] Currie BJ, Ward L, Cheng AC. The epidemiology and clinical spectrum of melioidosis: 540 cases from the 20 year Darwin prospective study. PLoS Negl Trop Dis. 2010;4:e900-e900. Doi: 10.1371/journal.pntd.0000900.
[10] Foong YC, Tan M, Bradbury RS. Melioidosis: A review. Rural Remote Health. 2014;14(4):2763. Doi: 10.22605/rrh2763.
[11] Alsaif HS, Venkatesh SK. Melioidosis: Spectrum of radiological manifestations. Saudi J Med Med Sci. 2016;4:74-78. Doi: 10.4103/1658-631X.178286.
[12] Vidyalakshmi K, Shrikala B, Bharathi B, Suchitra U. Melioidosis: An under-diagnosed entity in western coastal India: A clinico-microbiological analysis. Indian J Med Microbiol. 2007;25:245. Doi: 10.4103/0255-0857.34767.
[13] Patil C, Mangalagiri N, Ajmera P, Kumar KSP, Reddy H. A case report of Whitmore's disease: A true masquerader. Cureus. 2024;16(1):e52409. Doi: 10.7759/cureus.52409.
[14] Quiroga JB, García JU, Guedes JB. Hiccups: A common problem with some unusual causes and cures. Br J Gen Pract. 2016;66:584-86. Doi: 10.3399/bjgp16X687913.
[15] Cole JA, Plewa MC. Singultus. [Updated 2023 Jul 10]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK538225/.
[16] Pandey V, Rao SP, Rao S, Acharya KK, Chhabra SS. *Burkholderia pseudomallei* musculoskeletal infections (melioidosis) in India. Indian J Orthop. 2010;44:216-20. Doi: 10.4103/0019-5413.61829.
[17] Khan MR, Rahman S, Sami CA, Rashed HM, Khan AH, Arafat SM. Melioidosis: A case of multiple subcutaneous abscesses with sepsis. Bangladesh J Med. 2022;33:308-11. Doi: 10.3329/bjm.v33i3.61379.
[18] Ilhamjaya AM, Muhammad M, Ramadhan AR, Sjahril R. A rare finding of *Burkholderia pseudomallei* isolate from neck abscess, 4 years after the last report in Makassar: A case report. J Clin Microbiol Infect Dis. 2021;1(2):33-37. Doi: 10.51559/jcmid.v1i2.8.
[19] Ashdown LR. An improved screening technique for isolation of *Pseudomonas pseudomallei* from clinical specimens. Pathology. 1979;11:293-97. Doi: 10.3109/00313027909061954.
[20] Vijay J, Vedamanickam R, Devi KS. An interesting case of melioidosis. J Pharmaceut Res Int. 2021:634-37. Doi: 10.9734/jpri/2021/v33i59A34314.

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