Severe coinfection of melioidosis and dengue fever in Northeastern Brazil: first case report

Coinfeção grave de melioidose e dengue no Nordeste do Brasil: primeiro caso

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ABSTRACT

This report focuses on a fatality involving severe dengue fever and melioidosis in a 28-year-old truck driver residing in Pacoti in northeastern Brazil. He exhibited long-term respiratory symptoms (48 days) and went through a wide-ranging clinical investigation at three hospitals, after initial clinical diagnoses of pneumonia, visceral leishmaniasis, tuberculosis, and fungal sepsis. After death, Burkholderia pseudomallei was isolated in a culture of ascitic fluid. Dengue virus type 1 was detected by polymerase chain reaction in cerebrospinal fluid (CSF); this infection was the cause of death. This description reinforces the need to consider melioidosis among the reported differential diagnoses of community-acquired infections where both melioidosis and dengue fever are endemic.

Keywords: Melioidosis. Dengue fever. Coinfection.

RESUMO

Estudo de caso fatal de coinfeccção de melioidose e dengue grave em um motorista de 28 anos, residente no município de Pacoti, nordeste do Brasil. O paciente apresentou inicialmente sintomas respiratórios com evolução por 48 dias. Foi internado em três diferentes unidades de saúde com suspeitas de pneumonia, leishmaniose visceral, tuberculose e sepse fúngica. Após a morte, Burkholderia pseudomallei foi isolado em cultura de líquido ascítico. O vírus da dengue tipo 1 foi detectado por PCR no líquor do paciente. Esta descrição reforça a necessidade de considerar a melioidose entre os diagnósticos diferenciais de infecções comunitárias onde as duas doenças são endêmicas.


INTRODUCTION

Melioidosis was first diagnosed in Ceará in 2003¹², and so far, 17 cases have been confirmed. Recent studies indicate that the disease is endemic in northeastern Brazil¹⁴. Dengue fever is also endemic in this region, with cases reported since 1986 and widespread outbreaks occurring in 1994, 2003, 2008, and 2011, most significantly affecting the younger portion of the population¹⁵⁶. This is a report on a fatality involving severe dengue fever and melioidosis in a 28-year-old truck driver residing in Pacoti in northeastern Brazil. He exhibited long-term respiratory symptoms (48 days) and underwent a wide-ranging clinical investigation at three hospitals, after initial clinical diagnoses of pneumonia, visceral leishmaniasis, tuberculosis, and fungal sepsis.

On June 5th, 2010, the patient began to exhibit a daily evening fever, a persistent dry cough, malaise, and hyporexia. A physical examination revealed nothing abnormal. He was initially diagnosed with pneumonia 7 days after the onset of symptoms, and azithromycin was administered for 5 days (500mg 1x/d) followed by amoxicillin/clavulanate for another 7 days (800/125mg 3x/d). An initial investigation indicated pancytopenia with hemoglobin at 12.5g/dL (13.5-17.5g/dL), leukocytes at 2,700/mm³ (4,000-10,000/mm³), and platelets at 113,000/mm³ (130,000-400,000/mm³). However, a chest x-ray indicated nothing abnormal. The patient’s symptoms worsened, and in the middle of July, he was transferred to Fortaleza, capital of the State of Ceará, for further diagnosis. He had lost 5kg since the onset of clinical symptoms.

A complete blood count (CBC) revealed hemoglobin at 10.5g/dL (13.5-17.5g/dL) and leukocytes at 2,251/mm³ (4,000-10,000/mm³), including neutrophils at 1,000/mm³ (2,000-7,000/mm³), lymphocytes at 500/mm³ (1,000-4,000/mm³), and platelets at 104,000/mm³. A chest x-ray indicated a small opaque area in the right pulmonary hilum. Sputum samples tested negative for acid-alcohol-resistant bacillus (BAAR). An abdominal ultrasound scan revealed mild splenomegaly with no textural alterations. On July 10th, a high-resolution computed tomography indicated a thinned-walled cavitary lesion surrounded by satellite nodules and a “tree-in-bud” pattern located in the upper section of the inferior lobe of the right lung. On July 12th, as tuberculosis was suspected, tuberculosis treatment was initiated (rifampin, isoniazid, pyrazinamide, and ethambutol). The patient’s condition, however, did not improve, and he was hospitalized in Fortaleza on July 19th. A bronchoscopy was executed, and a bronchoalveolar lavage culture isolated Aspergillus spp. On July 24th, he was transferred to another hospital, as he was experiencing persistent daily fever (38.5 to 39°C), coughing with hyaline expectoration, respiratory discomfort, and bloatedness. A CBC revealed the following: hemoglobin, 9.83g/dL; Ht, 19.8%; leukocytes, 1,200/mm³, including neutrophils, 882/mm³, lymphocytes, 279/mm³, and platelets, 76,100 cells/mm³; blood urea, 27mg/dL; creatinine, 0.9mg/dL; sodium, 123mg/dL; potassium, 4.2mg/Dl; AST, 547U/L (15-37U/L); ALT, 267U/L;
Melioidosis has a broad clinical spectrum, from asymptomatic infection, localized acute or chronic supplicative infection, and latent chronic infection, to severe forms that include fulminant pneumonia and sepsis. Cavitary pneumonia accompanied by weight loss, often confused with tuberculosis, is another clinical presentation they also occur in other serious infections.

During the course of hospitalization, the patient developed respiratory distress with a drop in oxygen saturation, hypotension, abdominal discomfort, jaundice, and mental confusion. The following were found: arterial blood gas, pH 7.21 (7.35-7.45); PO2, 82mmHg (80-100mmHg); PCO2, 15mmHg (35-45mmHg); bicarbonate, 8.4mmEq/L (22-26mmEq/L); and StO2, 93.9%. Amphotericin B was discontinued and caspofugin (50mg 1x/d), imipenem (1g 2x/d), and teicoplanin (400mg 2x/d) were administered. Vigorous intravenous hydration with a crystalloid solution was maintained. After death, there were severe dyspnea, and endotracheal intubation was executed, along with the administration of vasoactive drugs. He was transferred to the Intensive Care Unit and died the same day. According to the pathologist, the cause of death was multiorgan failure, cardiovascular shock, and pulmonary edema.

**DISCUSSION**

Melioidosis has a broad clinical spectrum, from asymptomatic infection, localized acute or chronic supplicative infection, and latent chronic infection, to severe forms that include fulminant pneumonia and sepsis. Cavitary pneumonia accompanied by weight loss, often confused with tuberculosis, is another clinical presentation. The patient presented symptoms of chronic melioidosis with prolonged fever and lung involvement simulating pulmonary tuberculosis. The patient's symptoms progressively worsened after dengue infection, which probably began four days prior to death. The clinical presentation had 40 days of evolution and involved pancytopenia, which simulated other infections. The warning signs of dengue hemorrhagic fever could not have been suspected during the diagnosis involving the isolation of *Burkholderia pseudomallei* and DENV-1 confirms that the bacterial infection had a superimposed viral infection. Three important aspects make this noteworthy: 1) melioidosis should always be considered in differential diagnoses involving community-acquired infections in Brazil, where patients have a background of exposure to soil and water; 2) the clinical history of dengue fever, especially when it evolves into serious forms, may also simulate an acute melioidosis infection; and 3) dengue fever is a prevalent and serious health problem in the country, so the possibility of coinfection with melioidosis should always be taken into consideration. Moreover, a description of coinfection of dengue fever and melioidosis in Thailand supports the application of this recommendation in other countries where both diseases are endemic.

**REFERENCES**


**FINANCIAL SUPPORT**

This work was supported by the authors' own resources.