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A fatal case of imported malaria in a non-endemic developing country – Mongolia, 2016

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ABSTRACT

This report describes the first case fatality of imported malaria in Mongolia. The infection was acquired in Central Africa and the patient died nine days after onset of symptoms, four days after hospitalization, illustrating the need for improved familiarity with malaria in non-endemic, developing countries such as Mongolia.

1. Introduction

Plasmodium falciparum malaria is endemic throughout the tropical world, with hundreds of millions of cases and an estimated 438 000 deaths annually[1]. International travelers who contract malaria may not develop clinical disease until they return to their country of origin. In 2013, an estimated 6 800 cases of malaria were imported to non-endemic countries[2]. This poses a clinical

challenge to physicians in non-endemic areas (*e.g.*, Mongolia), as there may be critical delays in recognizing infection and obtaining access to artemisinin-based combination therapies.

2. Case report

In March 2016, a 31-year-old man presented to a provincial hospital in Mongolia with a five-day history of fever, vomiting, diarrhea, dizziness, and myalgia. He was evaluated, given Tylenol, and discharged that evening. The following morning, the patient returned to the hospital and was admitted, with additional symptoms of tachypnea and tachycardia. He received empiric doxycycline therapy in addition to supportive care, including fluid resuscitation and treatment for hyperglycemia. Upon

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admission to the hospital, the patient reported that disease onset occurred the same day that he had returned from the Democratic Republic of Congo (DRC), where he had been working for five months with a mining operation. He said he had been prescribed an unknown drug for malaria prophylaxis shortly after arriving in DRC, but reported poor adherence.

Shortly after admission, hospital staff sent a blood sample to the National Center for Zoonotic Diseases in Mongolia for testing. A peripheral blood smear revealed *Plasmodium falciparum* hyperparasitemia with an estimated 32% of erythrocytes infected (Figure 1). The diagnosis was confirmed by both rapid diagnostic test and PCR the same day.

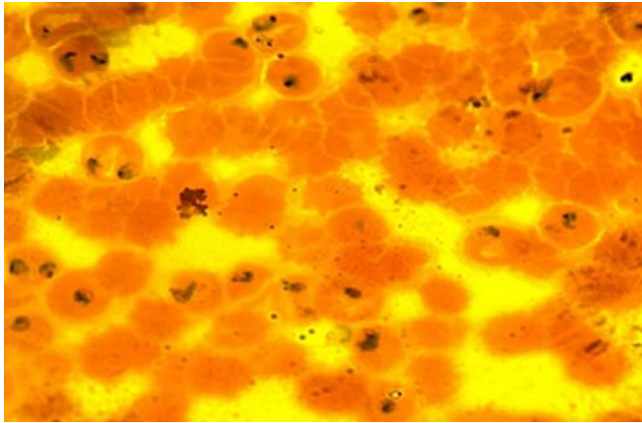


Figure 1. Thin blood smear of the patient showing high grade parasitemia with *Plasmodium falciparum* trophozoites and gametocytes.

Despite confirmed malaria diagnosis, access to treatment was delayed, as artemisinin-based combination therapy was not in stock at the admitting hospital. The following evening, seven days after illness onset (Day 2 of hospitalization), the patient began to receive intravenous artesunate, which was obtained from an international non-governmental organization. Despite initiating therapy, the patient developed subsequent renal and hepatic failure, followed by coma. Aggressive supportive measures were unsuccessful, and the patient died on the ninth day of illness (Day 4 of hospitalization). Delays in hospitalization, diagnosis, and treatment likely contributed to the patient's death.

3. Discussion

Malaria in immunologically naïve travelers often results in life-threatening disease. However, mortality from imported malaria is preventable with effective prophylaxis and prompt

diagnosis and treatment. The patient described above had traveled to an area of Africa with high malaria transmission intensity, and had reported poor compliance with his prophylactic regimen. Adherence to chemoprophylaxis, during time in malaria endemic countries and following returning home, must be emphasized in the pre-travel setting. Patients should be counseled to seek urgent medical care for any fevers following travel, and to report their travel history even if the physician does not ask. In this case, upon hospital admission, the patient was treated with doxycycline, which has antimalarial activity but would not be recommended as a sole agent for treatment of active infection. This chain of events underscores the difficulty in evaluating and treating malaria in non-endemic places where both physicians and patients are unfamiliar with infection. The international presence of Mongolia has grown as the country has transitioned from a socialist to a market economy, due in part to an expanding mining industry[3]. As international trade and travel increase, the frequency of imported malaria to Mongolia and other developing non-endemic countries will likely rise. This highlights the need to enhance recognition of malaria and ensure the availability of effective treatment in Mongolia and other non-endemic countries.

Conflict of interest statement

We declare that we have no conflict of interest.

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