

Public Health Preparedness at a Community Teaching Hospital: A Case Report Detailing Malaria Diagnosis and Treatment

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Introduction

- In August of 2023, CDC released an urgent public health update warning about the spread of malaria in the United States as well as advisories regarding countries in which malaria is endemic. Previously, the New Jersey Department of Health released an advisory statement regarding the rising cases of locally acquired malaria in Texas and Florida and the potential of increased cases in New Jersey.^{1,2}
- Hospital preparedness for malaria is crucial, as prompt treatment is required for this medical emergency. AtlantiCare Regional Medical Center (ARMC) proactively ensured the acquisition of appropriate antimicrobial therapy for malaria.
- We present the case of a patient who presented to ARMC with presumed travel-related malaria and received prompt, appropriate treatment due to the hospital's diligent approach to the public health warnings.

Presentation to Hospital

- A 40-year-old woman with no significant PMH reported to the emergency department (ED) after several days of fever, chills, body aches, nausea, and vomiting. She recently traveled to Ghana for 3 weeks and did not take any malaria prophylaxis.
- Upon arrival to the ED, the patient had tachycardia and was febrile with a heart rate of 146 beats per minute and a temperature of 102.2 degrees Fahrenheit. Labs revealed elevated lactate of 4 mmol/L, platelet count of 34,000 platelets per microliter of blood, elevated ferritin of 695 ng/mL, and elevated direct bilirubin of 0.6 mg/dL.
- The patient received one dose of intravenous (IV) vancomycin and IV piperacillin with tazobactam in the ED, 3 liters of IV fluid, and subsequently tested positive for COVID.
- Infectious disease (ID) was consulted and the patient was placed on isolation precautions and admitted into the intensive care unit (ICU) due to sepsis and hemodynamic instability.

Hospital Course

Day 1

- Parasite smear positive for parasitemia with a slide estimate of 1.75% infected red blood cells (RBC). Pathology reported the smear showed the presence of ring form intracellular parasites in RBCs, morphology consistent with Plasmodium species (malaria) or Babesia.
- Patient received four atovaquone 250 mg/proguanil 100 mg tablets by mouth once daily.
- Additional antibiotics prescribed were azithromycin 500 mg by mouth daily, doxycycline 100 mg by mouth twice daily, and ceftriaxone 2 grams IV daily.

Day 2

- Patient was stabilized in the ICU with no symptoms of shortness of breath, fevers, chills, or diarrhea.
- Pathologist identified numerous rings on the peripheral parasite smear and noted the differential diagnosis of Babesiosis or Malaria would be defined by clinical correlation.

Day 3

- Patient hemodynamically stable and downgraded out of the ICU.

Day 4

- Repeat parasite smear collected which resulted as positive; however, there were only 0.2% infected RBCs and few intracellular ring forms identified.

Day 5

- Thrombocytopenia was resolving as platelets increased to 86,000 platelets per microliter of blood.
- Patient discharged after completing a 5 day course of atovaquone with proguanil.

Discussion

- Our patient was diagnosed with malaria based on her history of travel to an area where malaria is endemic in addition to the clinical signs and symptoms displayed. The positive parasite smear with intracellular rings also helped confirm this diagnosis.
- Babesia and Plasmodium species can be difficult to differentiate on parasite smear. Typically, Babesia smears contain extracellular and intracellular forms as well as tetrads. It is important to note that the pathologists only distinguished the presence of intracellular ring forms on parasite smear. While this is not a definitive diagnosis for malaria, the clinical presentation and travel history strongly suggested malaria in this patient.
- Once the diagnosis was confirmed by ID providers, atovaquone with proguanil was initiated. This is one of the two CDC recommended initial treatments of malaria.
- If ARMC had not heeded the CDC's and New Jersey Department of Health's warnings, the patient would have experienced a delay in care and potentially more severe outcomes.

Conclusion

This case demonstrates the value of both preparedness and interactive collaborations between Infection Preventionists, Pharmacists, Laboratory personnel, and ID providers. Healthcare providers should stay abreast of the CDC warnings in order to optimize patient outcomes.

References

- Important Updates on Locally Acquired Malaria Cases Identified in Florida, Texas, and Maryland [Internet]. Centers for Disease Control and Prevention; 2023 [cited 2023 Nov 9]. Available from: <https://emergency.cdc.gov/han/2023/han00496.asp>
- Malaria Advisory: Locally Acquired Malaria Cases Identified in the United States [Internet]. New Jersey Department of Health; 2023 [cited 2023 Nov 9]. Available from: https://www.nj.gov/health/cd/documents/topics/malaria/CDC_HAN_LINCS_Malaria_08282023.pdf