Severe Babesiosis in a patient on Imatinib following a tick bite in Winter

Marianne Riordan, MD[1]; John Stern, MD[2]
[1]Department of Medicine, Pennsylvania Hospital, Philadelphia, PA; [2]Department of Medicine, Division of Infectious Diseases, Pennsylvania Hospital, Philadelphia, PA

Introduction

Babesiosis is primarily caused by the protozoa, Babesia Microti which is endemic to the Northeastern and Upper Midwestern United States. The vast majority of cases are diagnosed in summer and immunosuppressed patients are at increased risk of severe disease.

We describe the case of an older adult male, on imatinib, who presented with fever and hemolysis in January 2021 following a tick bite in December in Pennsylvania.

Case Presentation

A 65-year-old man with a history of coronary artery disease, hyperlipidemia and chronic myelogenous leukemia (CML), stable on imatinib for years, presented in January with a **one-week history of worsening fever, malaise, diarrhea and dark urine.**

Exam was remarkable for pallor and petechiae. He was febrile to 103.2F but other vitals were stable.

Labs were notable for pancytopenia and elevated AST, lactate, CRP and CK (see Table 1). Hemolysis was evident with low haptoglobin and elevated LDH and indirect bilirubin. Imaging was unremarkable. He was started on broad spectrum antibiotics. Imatinib was held.

Blood smear revealed chronic CML in remission, pancytopenia, spherocytes signaling hemolysis and intracellular ring parasite (trophozoites) and tetrad (Maltese cross) forms in RBCs consistent with babesiosis (See Image 1). **Parasitemia was 13.2%.** Further history revealed that the patient walked in woodland near his Pennsylvania home daily and had removed a tick from his leg 6 weeks prior.

He started **Azithromycin and Atovaquone**. He was also briefly on doxycycline while Lyme and anaplasmosis testing was pending. underwent **red cell exchange transfusion** for severe infection with parasitemia exceeding 10% and worsening anemia (Hb 6.5). Parasitemia improved to 3.2% day 1 post exchange transfusion and was 0% on day 10. He completed 6 weeks of Azithromycin and Atovaquone.

Table 1
Initial lab results

Lab	Value
White cell count	2.7 THO/uL
Platelets	38 THO/uL
Hemoglobin	8.1 g/dL
ALT	56 mg/dL
AST	135 mg/dL
Total Bilirubin	2.8 mg/dL
Direct Bilirubin	0.7 mg/dL
Indirect Bilirubin	2.1 mg/dL
Haptoglobin	< 30 mg/dL
Lactate Dehydrogenase	78 U/L
Ferritin	8286 ng/ml
Creatine Kinase	591 U/L
CRP	> 160 mg/L
Lactate	3.1 mmol/L
INR	1.4

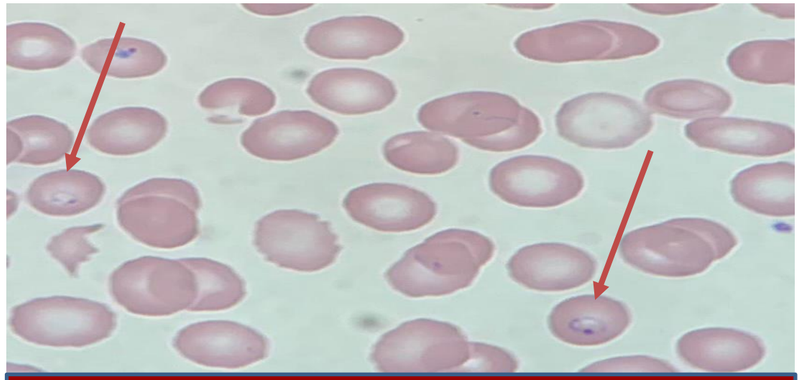

Image 1

Discussion

Incidence of babesiosis is increasing due to changes in patient and geographic factors. Traditional risk factors for severe babesiosis include advanced age, asplenia, and immunosuppression due to HIV/AIDS, cancer, chemotherapy, and transplantation.

The population of immunocompromised patients is growing due to the surge in development and use of biologic therapies. Cases have been described in patients on TNF-alpha inhibitors (infliximab) and anti-CD20 agents (rituximab) but, to our knowledge, this is only the second reported case of babesiosis in a patient on a tyrosine kinase inhibitor like imatinib.

Between 2011 and 2015, 94.5% of cases in the United States occurred in seven states, which did not include Pennsylvania.[1] However, the endemic region has expanded to include Southeastern Pennsylvania due to the increasing territory of Ixodes scapularis ticks and increasing prevalence of Babesia within them.

Most cases are diagnosed between June and August during peak tick activity; however, ticks can be active in winter when temperatures are warmer.

Conclusion

As the use of biologic agents increases and the endemic region expands along with lengthening peak season due to climate change, the population at risk continues to grow.

It is critical to remain vigilant for babesiosis but also for all tick-borne illnesses throughout the year and to have a high index of suspicion in patients on immunomodulatory therapies.

Reference

1 Gray EB, Herwaldt BL. Babesiosis Surveillance — United States, 2011–2015. *MMWR Surveill Summ* 2019; 68(No. SS-6):1–11.