Case Report

Acute Babesiosis in Pregnancy
A Novel Imitator of Hemolysis, Elevated Liver Enzymes, and Low Platelet Count Syndrome

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BACKGROUND: Hemolysis, elevated liver enzymes, and low platelet count (HELLP) syndrome is a serious complication of pregnancy associated with significant maternal and fetal morbidity and mortality. Several medical conditions have been described as imitators of this syndrome, presenting with similar signs and symptoms.

CASE: A term, multiparous woman with a history of prior pregnancy complicated by preeclampsia developed symptoms and laboratory abnormalities suggestive of HELLP syndrome. After an uncomplicated repeat cesarean delivery of a healthy newborn, infection with Babesia species was diagnosed incidentally on a peripheral blood smear. She was treated with antibiotics postpartum without sequelae for her or her newborn. The laboratory abnormalities normalized by postoperative day 4.

CONCLUSION: Babesiosis complicating pregnancy may be a novel imitator of HELLP syndrome and should be considered in the differential diagnosis, especially where geographically prevalent infection exists.

(Teaching Points)

1. Acute babesiosis infection during pregnancy may be an imitator of HELLP syndrome and should be considered in the differential diagnosis.
2. A peripheral blood smear, which is typically done to evaluate for hemolysis in patients with suspected HELLP syndrome, may assist in the diagnostic process by detecting intraerythrocytic parasites.

The syndrome of hemolysis, elevated liver enzymes, and low platelet count (HELLP) syndrome is associated with a significant risk of both maternal and fetal adverse outcomes. The diagnosis of HELLP syndrome is based on the detection of a spectrum of laboratory abnormalities during pregnancy and commonly accompanies new-onset hypertension with or without proteinuria in the absence of any other pathologic conditions. Several medical and surgical conditions as well as obstetric complications such as acute fatty liver of pregnancy, thrombocytopenic thrombotic purpura, hemolytic uremic syndrome, and exacerbation of systemic lupus erythematosus, have been described as potential imitators of HELLP syndrome, presenting with similar laboratory findings and clinical symptoms. We report a case of a term gravid woman presenting with a clinical picture similar to that of HELLP syndrome due to acute infection with Babesia species.

CASE

A 33-year-old woman, gravida 2 para 1001, presented to our labor and delivery unit at 38 4/7 weeks and of gestation complaining of acute-onset severe headache and right upper quadrant pain. This pregnancy had been uncomplicated thus far. In addition, she reported no significant medical or surgical history. Her obstetric history was significant for prior pregnancy complicated by mild preeclampsia and low transverse cesarean delivery after failed induction of labor at 37 weeks of gestation.

On evaluation, the patient reported nausea, general malaise, and episodes of mild-range hypertension at home. Physical examination revealed a normotensive (blood pressure 123/86 mm Hg), afebrile (temperature 98.2°F), ill-appearing woman with a heart rate of 102 beats per minute, respiratory rate of 16/min, and oxygen saturation of 100% on room air. Laboratory evaluation was significant for a low platelet count of 79,000 mm³, elevated lactate dehydrogenase of 394 units/L, mildly elevated alanine transaminase of 394 units/L, mildly elevated alanine transaminase of 59 units/L, and aspartate transaminase of 61 units/L, as well as a normal white cell count of 6,300 mm³ and hematocrit of 34.4%. Urinalysis revealed no proteinuria. A category I fetal heart tracing was documented. The patient had already been scheduled for...
a repeat cesarean delivery at 39 weeks of gestation, and a preoperative complete blood count 2 days before her admission revealed a platelet count of 148,000 mm$^3$ and hematocrit of 34.2%. Given her clinical symptoms of severe headache and right upper quadrant pain, obstetric history of preeclampsia, thrombocytopenia, hemolysis, and mild alterations in her liver enzymes (not twice the normal range), atypical HELLP syndrome was suspected and the decision was made to deliver. An uncomplicated repeat low transverse cesarean delivery was performed under general anesthesia resulting in the delivery of a healthy, 3,905-g newborn with Apgar scores of 9 and 9 at 1 and 5 minutes, respectively. Intravenous magnesium was administered for seizure prophylaxis.

After the delivery, the laboratory notified the obstetric team that intraerythrocytic parasites were observed on the peripheral blood smear (Fig. 1). Microbiology was consulted for a parasitemia workup, and a repeat blood smear revealed 0.71% intraerythrocytic ring forms consistent with Babesia species. On targeted questioning, the patient reported that she had recently moved to a small, rural town in New Jersey. Likewise, she reported that she had visited a local petting zoo 1 and 2 weeks before her admission. There was no obvious infectious tick bite site seen. A full panel of other tick-borne pathogens, including Borrelia burgdorferi, Rickettsia rickettsii, and Ehrlichia species, that have shown to co-infect with Babesia species was negative.

The patient was treated with oral clindamycin (600 mg three times/d) and quinine (650 mg three times/d). The newborn’s blood smear, polymerase chain reaction, and antibody testing were all negative for Babesia species. The patient’s postoperative course was uneventful, and her laboratory abnormalities normalized by postoperative
**DISCUSSION**

*Babesia* species are a subset of tick-borne protozoan parasites with emerging infection rates that have increased each year in the United States and Europe (Fig. 2). These parasites target erythrocytes and lyse them to continue their reproductive life cycle. The predominant species causing human babesiosis in the Northeastern and Upper Midwestern states is *Babesia microti*, which transmits primarily through the deer tick *Ixodes scapularis*. Clinical features of babesiosis vary and depend on the competency of the host’s immune system. Healthy individuals may remain asymptomatic or have self-limited symptoms of a mild, viral-like illness such as fatigue, malaise, fever, and chills. Severe illness can be seen in the elderly, immunocompromised, or asplenic population and may include clinical manifestations, such as respiratory distress, renal failure, hepatic insufficiency, disseminated intravascular coagulation, and in extreme cases, death. Laboratory features of babesiosis may include anemia, thrombocytopenia, elevated white blood cell count, and elevated liver enzymes.

Although infection is primarily transmitted via the deer tick, *Babesia* infection also may be acquired by transfusion of infected blood products or through vertical transmission from the mother to fetus. Intrauterine transmission in animals was first documented in 1976 with report of a calf that died shortly after birth from cerebral babesiosis. Since then, transplacental transmission has been reported in dogs and foals, with congenital babesiosis ultimately leading to death soon after birth. A recent report in 2013 outlined a case of transplacental vertical transmission of *Babesia* species in a 4-year-old gravid mare that ultimately led to an abortion, suggesting a fatal complication that could arise from gravid infection.

Three previous case reports of *Babesia* infection in pregnant women reported normal outcomes with uncomplicated term deliveries and no evidence of vertical transmission (Table 1). The hallmark of each presentation in these cases was high-grade fever, suggesting a likely infectious etiology. The obstetric management in these cases was therefore not affected by this finding. The clinical presentation in our case, however, was different. Given the absence of infectious signs and symptoms, this patient’s presentation was more suggestive of atypical HELLP syndrome, with babesiosis being an incidental laboratory finding.

Laboratory abnormalities typically noted in HELLP syndrome may be encountered with several conditions that are considered imitators of HELLP syndrome, such as acute fatty liver of pregnancy, thrombocytopenic purpura, hemolytic uremic syndrome, and exacerbation of systemic lupus erythematosus. All are rare disorders that require careful assessment of the clinical presentation and laboratory findings to be appropriately diagnosed. Our case indicates that babesiosis infection in pregnancy may be associated with laboratory abnormalities that are typically seen in HELLP syndrome. As babesiosis may present without clinical signs and symptoms of an infection, distinguishing between these two conditions may be challenging. Therefore, we suggest that acute infection with *Babesia* species may be considered in the differential diagnosis when appropriate, based on geographical area, travel history with possible exposure, or when signs and symptoms consistent with infection are present. A peripheral blood smear, which is typically done to evaluate for hemolysis in cases with suspected HELLP syndrome, may assist in the diagnostic process by detecting intraerythrocytic parasites.

**Table 1. Known Case Reports of Babesiosis in Pregnancy With Associated Clinical Features, Laboratory Abnormalities, and Pregnancy Outcomes**

<table>
<thead>
<tr>
<th>Case Report</th>
<th>Gestational Age at Presentation (Wk)</th>
<th>Temperature</th>
<th>Complete Blood Count</th>
<th>Comprehensive Metabolic Panel</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raucher et al, 1984</td>
<td>19</td>
<td>104.9°F</td>
<td>WBC 2,800 mm³; Hb 7.3 g/dL; Hct 20.8%; Plt 86,000 mm³</td>
<td>Liver enzymes not reported</td>
<td>Expectant, uncomplicated cesarean delivery at term</td>
</tr>
<tr>
<td>Feder et al, 2003</td>
<td>37</td>
<td>103°F</td>
<td>WBC 5,400 mm³; Hct 29%; Plt 96,000 mm³</td>
<td>Liver enzymes not reported</td>
<td>Clindamycin and quinine, uncomplicated delivery at term</td>
</tr>
<tr>
<td>Luckett et al, 2014</td>
<td>21</td>
<td>103.1°F</td>
<td>WBC 8,700 mm³; Hct 24.8%; Plt 67,000 mm³</td>
<td>ALT 185 units/L; AST 180 units/L</td>
<td>Clindamycin and quinine, uncomplicated delivery at term</td>
</tr>
</tbody>
</table>

WBC, white blood cells; Hb, hemoglobin; Hct, hematocrit; Plt, platelets; ALT, alanine transaminase; AST, aspartate transaminase.
Given the rapid resolution of our patients’ symptoms and laboratory abnormalities, one cannot be certain whether this clinical presentation represents resolution of HELLP syndrome after delivery or acute babesiosis after antibiotic therapy. Nevertheless, we believe that our case demonstrates that *Babesia* infection may be considered as an imitator of HELLP syndrome, especially when exposure to ticks may have occurred.

REFERENCES


Zika Virus Resources

Visit the following resources for detailed guidance and up-to-date information:

- American College of Obstetricians and Gynecologists: www.acog.org/zika

**CDC Zika Pregnancy Hotline for Health Care Providers:**

Obstetrician–gynecologists can contact the CDC Zika Pregnancy Hotline at 770-488-7100 or e-mail ZikaPregnancy@cdc.gov for any concerns related to clinical management or the U.S. Zika Pregnancy Registry.

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