Acute Kidney Injury (AKI), Thrombocytopenia & Hemolytic Anemia With Schistocytes: Babesiosis Mimicking Thrombotic Thrombocytopenic Purpura (TTP) Symptomology

Harshal Shah DO  
*Lehigh Valley Health Network*, Harshal.Shah@lvhn.org

Dhwani Pandya MD  
*Lehigh Valley Health Network*, Dhwani.Pandya@lvhn.org

Timothy Coyle MD  
*Lehigh Valley Health Network*, Timothy_B.Coyle@lvhn.org

Follow this and additional works at: [http://scholarlyworks.lvhn.org/patient-care-services-nursing](http://scholarlyworks.lvhn.org/patient-care-services-nursing)

Part of the Nursing Commons

Published In/Presented At


This Poster is brought to you for free and open access by LVHN Scholarly Works. It has been accepted for inclusion in LVHN Scholarly Works by an authorized administrator. For more information, please contact LibraryServices@lvhn.org.
Acute Kidney Injury (AKI), Thrombocytopenia & Hemolytic Anemia With Schistocytes: Babesiosis Mimicking Thrombotic Thrombocytopenic Purpura (TTP) Symptomology

Harshal P Shah DO, Dhwani Y Pandya MD and Timothy Coyle DO
Lehigh Valley Health Network, Allentown, Pennsylvania

Background

- **Babesiosis** is a zoonotic infection predominantly caused by the parasite *Babesia microti* and is transmitted by ticks.
- Ticks of the genus *Ixodes scapularis* are the primary vector for the parasite, along with *Borrelia burgdorferi*, the organism responsible for Lyme Disease.
- In the US, babesiosis is rare and occurs in limited geographic distribution; it is primarily asymptomatic except in immunocompromised, asplenic or elderly patients (pts) (>50 yo).
- The disease is most prevalent during the spring and summer months due to increased tick activity.
- The incubation period after a tick bite ranges from 1-3 weeks, with a maximum duration of up to 2 months.
- Most healthy patients with a Babesiosis infection remain asymptomatic.
- Others can present with fevers and chills or fatigue, and some can progress to severe disease with multi-organ failure.

**Thrombotic, thrombocytopenic purpura (TTP)** is a rare blood disorder with the classic pentad of petechia from thrombocytopenia of approximately 90%, which is consistent with TTP in an immunocompetent, normosplenic gentleman.

Case Presentation

- 82 year old healthy Caucasian male.
- Past medical history of hypertension, dyslipidemia, depression and gout.
- Pt admitted with vague generalized symptoms of weakness, lethargy and dizziness for the past week along with decreased appetite.
- Upon admission pt was febrile at 101.1°F along with petechial rash on his lower extremities.
- Labs revealed new-onset anemia, thrombocytopenia, normal WBC count with 1% bandemia and new onset AKI.
- Review of the peripheral smear revealed evidence of schistocytes.
- Further testing was consistent with a hemolytic process with negative blood cultures.
- Initial workup and labs are displayed in Table 1.
- Given concern for TTP, a repeat smear was performed and reviewed by a hematopathologist, which revealed intra and extracellular inclusions.
- A parasitic blood smear then revealed *B. microti* with 1% parasitemia.
- Treatment was initiated with atovaquone, azithromycin and doxycycline.
- The remainder of the pts workup was negative with *B. microti* the sole source of infection.
- At one-month follow up, the patient had completed his course of antibiotics and had 50% improvement in fatigue.

Diagnosis Via Thin Blood Smear

- *B. microti* appear round, oval, or pear shaped (Fig.1).
- The most common form is the ring, with a pale blue cytoplasm and one or two red chromatic dots.
- Multiple infections per cell may be observed.
- Distinguishing features of Babesia include:
  - Occasional merozoites arranged in tetrads, referred to as “Maltese Cross”
  - Occasional exerythrocytic parasites (when parasitemia is high)

![Image](http://www.med-chem.com/para-site.php?url=org/babesia)

**Table 1: laboratory Data**

<table>
<thead>
<tr>
<th>Lab</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium</td>
<td>134</td>
</tr>
<tr>
<td>Potassium</td>
<td>3.9</td>
</tr>
<tr>
<td>Chloride</td>
<td>136</td>
</tr>
<tr>
<td>Bicarbonate</td>
<td>24</td>
</tr>
<tr>
<td>BUN to CREATININE</td>
<td>30.12 (M)</td>
</tr>
<tr>
<td>Glucose</td>
<td>124</td>
</tr>
<tr>
<td>WBC</td>
<td>15.8</td>
</tr>
<tr>
<td>HxR</td>
<td>5.3 &amp; 15.5</td>
</tr>
<tr>
<td>Reticulocyte</td>
<td>85 (M)</td>
</tr>
<tr>
<td>Haptoglobin</td>
<td>115</td>
</tr>
<tr>
<td>J22</td>
<td>292 (M)</td>
</tr>
<tr>
<td>Fibrinogen</td>
<td>45B</td>
</tr>
<tr>
<td>Parasites Blood Smear</td>
<td>For B. microti, 1% parasitemia</td>
</tr>
<tr>
<td>CK</td>
<td>267</td>
</tr>
<tr>
<td>Lyme Antibody Profile</td>
<td>Negative</td>
</tr>
</tbody>
</table>

Discussion

- A diagnosis of TTP is strongly suspected in an elderly patient that presents with fevers, AKI, thrombocytopenia and hemolytic anemia, and with smears showing schistocytes – especially with concern for TTP due to underlying malignant process.
- A complete pentad of TTP is reportedly to occur in < 5% of cases – the most common being MAHA and thrombocytopenia.
- TTP Pentad:
  - MAHA (Microangiopathic Hemolytic Anemia)
  - Neurologic Abnormalities
  - Thrombocytopenia
  - Renal Abnormalities – AKI most common
  - Fever
- However, in our patient, smears showed schistocytes with intra and extracellular inclusions with parasite cultures diagnosing *B. microti* – with 1% parasitemia.
- The degree of parasitism of RBC’s determines the clinical presentation; as parasites exit the RBC they cause damage to its membrane, which can result in hemolysis.
- This effect on the RBC membrane causes a decrease in the deformability and increase in adherence, which can lead to serious complications such as pulmonary edema or acute respiratory distress syndrome (ARDS).
- RBC fragments can cause microvascular stasis involving the liver, spleen, kidneys, and CNS.
- Asplenic patients suffer a greater degree of infection due to lack of sequestration of infected RBC’s, which prevents their uptake by macrophages.
- This leads to a higher degree of parasitemia, which may lead to hypoxemia.
- Severe cases of babesiosis can lead to significant respiratory distress due to damages in the RBC membrane, which occur post-treatment.
- Mechanisms which lead to ARDS are thought to be via endotoxins, complement activation, immune complex deposition, and ultimately microemboli and even rare cases leading to disseminated intravascular coagulopathy (DIC).
- Complications of severe babesiosis can include MI, CHF, AKI, seizures, and eventually multi-organ dysfunction.
- Prompt recognition with peripheral smear morphology can prevent inappropriate treatment and prevent progression of the infection.
- Overall, it is of great significance to include this parasitic infection as part of the differential diagnosis in pts presenting with TTP-like symptoms.

Treatment

- Most healthy and asymptomatic patients do not require treatment, however treatment is recommended to prevent subsequent complications and transmission via blood donation.
- Elderly patients and immunocompromised should be treated with IV clindamycin and oral quinine vs. IV atovaquone and azithromycin for total of 7-10 days.
- Patients who develop severe respiratory distress may require mechanical intubation.
- High parasitemia defined as >10% with significant hemolysis can lead to profound anemia, and transfusions should be administered as needed.

References: