JUN 11 2010

The Honorable Joan Carter Conway, Chair
Education, Health & Environmental
Affairs Committee
2 West, Miller Senate Building
Annapolis MD 21401-1991

The Honorable Peter A. Hammen, Chair
Health and Government Operations
Committee
Room 241, House Office Building
Annapolis MD 21401-1991

RE: Reporting of Anaplasmosis and Babesiosis in Maryland
as Required by HB 119/Chapter 377 of the Acts of 2007

Dear Chair Conway and Chair Hammen:

Pursuant to HB 119 - Laboratory Examination Reports - Invasive Diseases, Chapter 377 of the Acts of 2007, this report summarizes the public health surveillance of two diseases, babesiosis and anaplasmosis, from October 1, 2007 to December 4, 2009. In addition, this report recommends continued monitoring and reporting of the two diseases by the Maryland Department of Health and Mental Hygiene (the Department).

Background

Babesiosis is a tick-borne malaria-like disease caused by species of Babesia, most commonly Babesia microti, which are parasitic organisms that infect red blood cells. The disease is transmitted by the bite of an infected black-legged tick, Ixodes scapularis, which is the same tick that transmits Borrelia burgdorferi, the causative agent of Lyme disease.

Most infections with Babesia are probably asymptomatic, but symptomatic, manifestations of disease include fever, chills, sweating, muscle aches, fatigue, enlargement of the liver and spleen, hemolytic anemia and jaundice. The disease is more severe in patients who are immunosuppressed, splenectomized, and/or elderly. Dual infection (co-infection) with B. burgdorferi can increase the severity of both diseases.

In the United States, tick-borne transmission is most common in parts of the Northeast and upper Midwest and usually peaks during the warm months. There is increasing evidence that the geographic range of Babesia in the Northeast is more extensive than initially thought; specifically, since the parasite was first detected on Nantucket Island in Massachusetts, it has also been detected in New Jersey, New York, Connecticut and Rhode Island. In addition to natural transmission of the parasite via a tick bite, there is also growing concern about the frequency with which Babesia is transmitted via blood transfusion.
Infection with *Babesia* is not currently a nationally notifiable disease, per the Council of State and Territorial Epidemiologists (CSTE) and the Centers for Disease Control and Prevention (CDC); however, given the increasing geographic range noted for the natural occurrence of the pathogen and the increased risk associated with blood transfusions, there are discussions underway to add *Babesia* infection to the list of nationally notifiable diseases.

There are at least three species of intracellular bacteria responsible for the tick-borne diseases called ehrlichiosis and anaplasmosis in the United States: *Ehrlichia chaffeensis*, *Anaplasma phagocytophilum*, and *Ehrlichia ewingii*. The clinical signs of disease that result from infection with these agents are similar, and the geographic range distributions of the disease agents overlap. To further complicate diagnosis, cross-reactions may occur among diagnostic tests for these diseases, with a potential for false positive test results.

As more has been learned about these bacteria and their associated infections, the names of both the bacteria and their associated diseases have changed, resulting in confusion not just amongst the public but also within the scientific and medical communities. The disease now called human anaplasmosis (also called human granulocytic anaplasmosis (HGA), and previously called human granulocytic ehrlichiosis (HGE)) is caused by *Anaplasma phagocytophilum* (previously called *Ehrlichia phagocytophila*). Human anaplasmosis is characterized by acute onset of fever and one or more of the following symptoms or signs: headache, muscle aches, malaise, anemia, decreased white blood cells, decreased platelets, or elevated liver enzymes. Nausea, vomiting, or rash may be present in some cases.

Anaplasmosis, like babesiosis, is transmitted by the bite of an infected black-legged tick, *I. scapularis*, which is the same tick that transmits Lyme disease. Co-infections with any combination of Lyme disease, babesiosis and anaplasmosis are possible in both tick vectors and the humans they infect.

Ehrlichiosis and anaplasmosis are nationally notifiable diseases, per the CSTE and the CDC. Before the recent changes in the names of the bacteria, “ehrlichiosis (HGE), other or unspecified” was reportable both nationally and in Maryland, and would have captured what is currently called anaplasmosis.

**Babesia and Anaplasma Reporting in Maryland**

Given the potential for co-infections with Lyme disease, babesiosis and anaplasmosis, as well as the large number of reported cases of Lyme disease in Maryland, efforts were made to add both babesiosis and anaplasmosis to the list of reportable diseases and conditions in Maryland. In effect, babesiosis was the only actual addition to the list, because ehrlichiosis (the previous name of anaplasmosis) was already reportable. The addition of anaplasmosis to the list
of reportable diseases in Maryland was actually a reflection of its name change only, and not a new condition under public health surveillance.

The passage of HB 119 resulted in amendments to Md. Code Ann., Health-General §18-205 for the reporting of babesiosis and anaplasmosis by laboratories. Revisions to COMAR 10.06.01 were subsequently promulgated to align health care provider reporting with statutory reporting requirements by laboratories. The new reporting requirements became effective October 1, 2007.

Reporting Results: Babesiosis

During the period October 1, 2007 – December 4, 2009, 139 babesiosis investigations were conducted by the local health departments and forwarded for review and confirmation by the Department. Of those, 95 (68%) met the case definition for confirmed, probable or suspect babesiosis, according to the Department case definition, and 44 were ultimately determined to be “not a case.”

Table 1. Reported cases of babesiosis, Maryland, October 1, 2007 – December 4, 2009

<table>
<thead>
<tr>
<th>YEAR</th>
<th>Confirmed</th>
<th>Probable</th>
<th>Suspect</th>
<th>Total</th>
</tr>
</thead>
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<tr>
<td>2007</td>
<td>1</td>
<td>11</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>2008</td>
<td>4</td>
<td>24</td>
<td>11</td>
<td>39</td>
</tr>
<tr>
<td>2009</td>
<td>4</td>
<td>21</td>
<td>16</td>
<td>41</td>
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<tr>
<td>Grand Total</td>
<td>9</td>
<td>56</td>
<td>30</td>
<td>95</td>
</tr>
</tbody>
</table>

Of note among the nine confirmed cases of babesiosis were a transfusion-transmitted Babesia infection and a case resulting from probable local (Maryland) transmission of the parasite.

The transfusion associated case occurred in an 84 year old man with a complicated medical history who presented to his health care provider because of persistent fevers. Over a 21 month period, he received 29 transfusions; he did not have a history of tick bite and was rarely outdoors. After a diagnosis of babesiosis was determined, an investigation was initiated by the blood bank that involved testing and interviewing all of the donors. One donor, a Massachusetts resident who donated blood in Maryland, was implicated as the source of infection. This case illustrates how investigations quickly become complex when blood products are implicated as
the potential source of infection. It also illustrates that despite there being a geographic component to the natural occurrence of babesiosis, infected individuals and infected blood products can and do travel, resulting in the potential for transmission outside of the natural geographic range of the pathogen.

The case that suggests that *Babesia* occurs naturally in Maryland involved an 86 year old previously healthy woman who presented to her health care provider because of weakness that resulted in hospitalization. During her hospitalization, she was transfused with products from two donors. She was subsequently diagnosed with B-cell lymphoma and with babesiosis. Because of her complicated medical picture, she was transferred to a tertiary care hospital for treatment, including dialysis. The initial *Babesia* investigation focused on the blood products as sources of her infection, but the donors tested negative and her infection was ruled out as a transfusion-associated case. The patient was an avid gardener and resident of a county on the upper Eastern shore (the upper Eastern shore has the highest incidence of Lyme disease in Maryland) and had no travel history to a *Babesia*-endemic area. After consultation with the CDC, it was felt that she was asymptotically infected with *B. microti*, possibly for years, until the onset of clinical signs associated with her B-cell lymphoma, which precipitated a hemolytic crisis due to her *Babesia* infection. The immunosuppressive therapy for her lymphoma further exacerbated her *Babesia* infection. After an extended hospitalization, the patient was ultimately discharged home.

**Reporting Results: Anaplasmosis**

During the period October 1, 2007 – December 4, 2009, 44 anaplasmosis investigations were conducted by the local health departments and forwarded for review and confirmation by the Department. Of those, 21 (47%) met the case definition for confirmed, probable or suspect anaplasmosis, according to the CDC/CSTE case definition; 23 were determined to be “not a case.”

**Table 2. Reported cases of anaplasmosis, Maryland, October 1, 2007 – December 4, 2009**

<table>
<thead>
<tr>
<th>YEAR</th>
<th>Confirmed</th>
<th>Probable</th>
<th>Suspect</th>
<th>Total</th>
</tr>
</thead>
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<tr>
<td>2009</td>
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<td>0</td>
<td>6</td>
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<tr>
<td>Grand Total</td>
<td>3</td>
<td>8</td>
<td>10</td>
<td>21</td>
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</table>
There are other tick-borne diseases reportable in Maryland, most notably Lyme disease, but also ehrlichiosis, tularemia, and Rocky Mountain spotted fever. The Department records thousand of cases of Lyme disease each year, indicating that transmission of tick-borne disease in Maryland occurs frequently.

Conclusions and Recommendations

The Maryland Department of Health and Mental Hygiene recommends continuing the surveillance for infections caused by Babesia and Anaplasma in Maryland. Cases of anaplasmosis and babesiosis do occur in Maryland, and the Department’s surveillance system is able to detect them. Recognition of such events is important to appreciate the extent of natural transmission of the pathogens, as well as to keep the blood supply safe. The reporting of these two diseases is consistent with national standards; infections with Anaplasma are currently nationally notifiable, and it is expected that infections with Babesia will be made nationally notifiable in the near future.

I hope this information is useful. If you have any questions regarding this report, please contact Wynee E. Hawk, R.N., J.D., Director of the Office of Governmental Affairs, at (410) 767-6481.

Sincerely,

John M. Colmers
Secretary

cc: Ms. Sarah Albert, MSAR# 6535
Katherine Feldman, D.V.M.
Heather Hauck, L.C.S.W.
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Frances B. Phillips, R.N., M.H.A.