

## A Brief Overview of an Often Overlooked Fact-that Babesia Infections can also Display Neurological Ramifications

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Quotation: "One must always be aware of the fact that *Babesia* infections always carry the possible risk of neurological involvement".

Babesiosis is a tick borne protozoan pathogenic infection that is most frequently due to the bite of a tick of the of the *Ixodes* genus [1]. *Babesia* infections involve invasion and destruction of red blood cells. The red blood cells have been found to be the only known cell which serves as a host for *Babesia* [2]. These *Babesia* protozoan parasites can be seen microscopically as a "cross of malta" but, it must be noted that *Babesia* parasites have often been mistaken for Malarial pathogens [4]. More specific testing for identifying the presence of *Babesia* pathogens involves the application of polymerase chain reaction (PCR) and immunofluorescence antibody based methodologies.

One also must be aware of the fact that *Babesia* infections can be also acquired from blood transfusions, as well as, via the transplacental route [1,3]. *Babesia* infections are commonly associated with several species of *Babesia*, namely, *Babesia microti*, *Babesia duncani* and *Babesia divergens* [1].

In North America Babesiosis is associated with the bite of a blacklegged deer tick *Ixodes scapularis*. The two most frequently encountered species in North America are *Babesia microti* and *Babesia duncani* [2]. In Europe the tick specie that is associated with *Babesia* infections is *Ixodes ricinus*. The *Babesia* pathogen most frequently encountered in Europe is *Babesia divergens* [2]. Horowitz has noted that different species of *Babesia* can bring about different symptoms [4].

Horowitz cites the fact that *Babesia* infections can actually bring on hemolytic anemia, jaundice, thrombocytopenia, congestive heart failure and renal failure [4]. Horowitz also notes that there often can be many additional nonspecific symptoms such as fever, shaking, chill and an excessive amount of sweating [4]. These latter symptoms could be mistaken for malaria [4].

In areas that are endemic for tick borne diseases, *Babesia* infection should be considered at the top of the list of potential pathogens especially if the patient has never traveled outside of the continental USA and lives in an area endemic for ticks, or had recently received a blood transfusion [1,4]. Thus, it is of extreme importance to ascertain whether or not the patient has ever travelled outside of the USA where he or she could have acquired Malaria which shares common symptoms with *Babesia* [1,4].

What must always also be remembered is that there does also occur *Plasmodium falciparum* related malaria which can manifest central nervous system symptoms [3]. A distinguishing feature between malaria and *Babesia* infections is that the former pathogen displays "fever periodicity" [3].

Neurological babesiosis is a less frequently encountered form *Babesia* infection [1,5]. Venigella, *et al.* have noted that some of the distinctive markers as concerns neurological babesiosis involve the presence of an altered mental status and ataxia [5]. Venigella, *et al.* observed patients with neurological babesiosis who additionally displayed such symptoms as confusion, cognitive impairment, slurred speech, fever and myalgias [5].

What must be understood is that even though cases of neurological *Babesia* infections are uncommon, they can often result in a fatal outcome [5]. The reason for a potentially fatal outcome is based upon the fact that the patient can be experiencing an extremely elevated parasitic load or “parasitemia” [1]. A point that is still not yet clearly understood as concerns neurological babesiosis pathology relates to whether its pathology is due to the effect of the parasite on Neurological tissue or due to its indirect effect on organ systems of the human body [1].

One must always be aware of the fact that *Babesia* infections always carry the possible risk of neurological involvement.

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