



Babesiosis

[Introduction](#)

[Epidemiology](#)

[Risk for travellers](#)

[Transmission](#)

[Signs and symptoms](#)

[Treatment](#)

[Prevention](#)

[References](#)

[Link](#)

Introduction

Babesiosis is caused by intraerythrocytic protozoa of the genus *Babesia* and is transmitted by *Ixodes* sp. ticks [1]. Only a few of the more than 100 species of *Babesia* cause disease in humans, usually *B. microti* and *B. divergens*; other species have recently been identified [2].

Epidemiology

Most cases of babesiosis occur in North America. While babesiosis occurs in Europe, it remains a rare disease. Little is known about prevalence in malaria endemic areas where there is the potential for misdiagnosis as *P. falciparum* [2]. In Europe babesiosis is usually caused by *B. divergens* and is seen almost exclusively in splenectomised patients [3], a known risk factor for symptomatic babesiosis [1, 2, 4]. The first documented human case was in 1956 in an asplenic man in the former Yugoslavia [5]. Since then approximately 30 cases have been reported in Europe [5].

In the United States (New England, particularly coastal areas and islands, New York, New Jersey, Minnesota and Wisconsin) most cases are due to *B. microti* [1]. Two *Babesia* variants have been reported in Washington and California (WA1- type and related parasites) and Missouri (MOI). Several hundred cases have been reported from the United States (US) over the last four decades [6]. From 1993 to 2001, 40 cases were reported in the state of New Jersey [7], and in 2001, five cases were reported in persons who lived and worked in previously unaffected areas of New York state [8].

Risk for travellers

Travellers to endemic areas, who are exposed to ticks, are at risk of disease. Infected ticks are found on forest fringes with adjacent grassland, forest glades, riverside meadows and marshland, forest plantations with brushwood, and shrubbery. They reside most commonly on ground level vegetation, on the underside of foliage, from where they can be brushed onto clothing or drop onto passing humans. Immunocompromised, elderly and asplenic individuals are at higher risk of complications [2, 9].

Transmission [2]

Humans are accidental hosts of *Babesia* sp. Babesiosis is a zoonosis which is acquired through the bite from an infected *Ixodes* sp. tick. This tick is the same insect that transmits Lyme disease and tick-borne encephalitis. In the US the reservoir of *B. microti* is the white footed mouse and the parasite is transmitted by *Ixodes scapularis* ticks. In Europe the reservoir of *B. divergens* is cattle and the disease is transmitted by *Ixodes ricinus* ticks. Most cases occur during the warmer months of late spring, summer and early autumn, when the ticks are feeding and man is active in the areas of exposure. There is no evidence of transmission between humans via biting ticks, although transmission has occurred through infected blood transfusions [2].

Signs and symptoms [9]

Illness with *B. divergens* usually occurs in asplenic patients who become infected and is fulminant in character. Infection with *B. microti* is often asymptomatic or mild. Those who are symptomatic with *B. microti* are often older (usually older than 50 years), asplenic or with medical conditions of immunosuppression, including HIV infection [10].

Following an incubation period of one to four weeks, patients with *B. microti* may present with anorexia, fatigue, fever, sweating, rigors and generalized myalgias. Mild splenomegaly and hepatomegaly may be present. Complications such as severe anaemia, adult respiratory distress syndrome, disseminated intravascular coagulation, congestive heart failure and renal failure can occur in severe cases [11, 12]. Illness with *B. divergens* is severe and associated with haemolysis, anaemia and haemoglobinuria. Complications of pulmonary oedema and oliguric renal failure can occur.

As *Ixodes scapularis* is also the vector for Lyme disease and human granulocytic anaplasmosis, co-infection of *Babesia* with these other organisms is not uncommon.

Diagnosis is generally made by identification of characteristic intraerythrocytic parasites on stained blood smear, by detection of anti-*Babesia* antibody or by assay for babesial DNA through polymerase chain reaction.

Treatment

Treatment guidelines for babesiosis have recently been published [1]. In asymptomatic or mildly symptomatic patients, babesiosis is usually a self-limited illness and is not specifically treated, as the diagnosis may never be confirmed. Clinical disease should be treated with either a combination of atovaquone and azithromycin or quinine and clindamycin. Patients who are unable to take oral medications should be treated with intravenous quinine and clindamycin.

Cases of moderate to severe disease will require close monitoring and support. Exchange transfusion may need to be performed in severe cases. In mild to moderate cases improvement would be expected within 48 hours of the commencement of treatment.



Prevention

Prevention of babesiosis includes awareness of risk and avoidance of the tick vector. Travellers to endemic areas should be advised to wear protective clothing i.e. long sleeved shirts, long trousers tucked into socks and closed toe walking boots or shoes. DEET-based insect repellents on exposed skin should be used and the insecticide permethrin can be applied to clothing [13]. Following exposure, travellers should carefully check themselves for ticks. Any attached ticks should be removed by grasping firmly at the head and pulling out the tick [see Link].

References

1. Wormser G, Dattwyler R, Shapiro E et al. The clinical assessment, Clinical Assessment, treatment and prevention of Lyme disease, human granulocytic Disease, Human Granulocytic anaplasmosis and babesiosis: Clinical Practice Guidelines. Infectious Diseases Society of America. Clin Infect Dis 2006;43:1089–1134.
<http://www.journals.uchicago.edu/CID/journal/issues/v43n9/40897/40897.html>
2. Centers for Disease Control, Division of Parasitic Diseases. Laboratory Identification of Parasites of Public Health Concern; Babesiosis. 2002; 10 August. [Accessed 22 May 2007]
<http://www.dpd.cdc.gov/dpdx/HTML/Babesiosis.htm>
3. Gorenflot A, Moubri K, Precigout E, Carcy B, Schetters TP. Human babesiosis. Ann Trop Med Parasitol 1998;92:489-501
4. Rosner F, Zarrabi MH, Benach JL, Habicht GS. Babesiosis in splenectomized adults. Review of 22 reported cases. Amer J Med 1984;76:696-701.
5. Herwalt B, Caccio S, Gherlinzoni F et al. Molecular Characterization of a non-*Babesia divergens* Organism Causing Zoonotic Babesiosis in Europe. Emerg Infect Dis EID 2003;9:942–8.
6. Kjemtrup AM, Conrad PA. Human babesiosis: an emerging tick-borne disease. Int J Parasitol 2000;30:1323-37.
7. Herwalt B, McGovern P, Gerwel M. Endemic Babesiosis in Another Eastern State: New Jersey. Emerg Infect Dis EID 2003;9:184–8.
8. Krogut S, Thill C, Prusinski M, Lee J-H. *Babesia microti*, Upstate New York. Emerg Infect Dis EID 2005;11:476-8.
9. Cook G & Zumla A. Manson's Tropical Diseases. WB Saunders; Edinburgh: 2003.
10. Falagas ME, Klempner MS. Babesiosis in patients with AIDS: a chronic infection presenting as fever of unknown origin. Clin Infect Dis 1996;22:806-12.
11. Hatcher JC, Greenberg PD, Antique J, Jimenez-Lucho VE. Severe babesiosis in long island: review of 34 cases and their complications. Clin Infect Dis 2001;32:1117-25.
12. White DJ, Talarico J, Chang HG, et al. Human babesiosis in New York State: Review of 139 hospitalized cases and analysis of prognostic factors. Arch Intern Med 1998;158:2149-54.
13. NaTHNaC Health Information Sheet. Insect Bite Avoidance. April 2007.
<http://www.nathnac.org/pro/factsheets/iba.htm>



Link

United States Centers for Disease Control and Prevention (CDC). Tick removal. 13 October 2005 http://www.cdc.gov/ncidod/dvbid/lyme/ld_tickremoval.htm