Working Group on Canine vector borne diseases

Babesiosis in dogs

FECAVA Federation of European Companion Animal Veterinary Associations

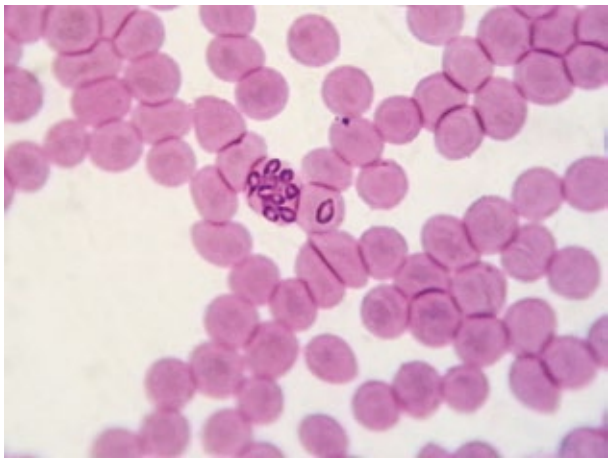
Babesia spp.

- Babesiosis (also referred to as piroplasmosis) is caused by different species of protozoan intracellular parasites of the *Babesiidea* family.
- Babesiosis is the most important and widely distributed tick-borne disease of dogs and wild canines (wolves, foxes, jackals).
- It can be transmitted by ticks, but also transplacentally and by blood transfusion.
- There is also evidence that *Babesia gibsoni* can be transmitted directly from dog to dog by bites.
- *Babesia* species can be divided according to their size, antigenicity, tick vectors, virulence and by their genome.
- The most important *Babesia* species that infect dogs are outlined in the table below. *B. canis, B. vogeli, B. gibsoni* and *B microti*-like are the most common in Europe.

Size	Species	Tick vectors	Virulence
Large 2.5-5.0 µm	*Babesia canis*	*Dermacentor reticulatus*	Moderate to severe
	Babesia vogeli	*Rhipicephalus sanguineus*	Mild to moderate
	Babesia rossi	*Haemaphysalis elliptica*	Moderate to severe
Small 1.0-2.5 µm	*Babesia gibsoni*	*Haemaphysalis sp. Rhipicephalus sanguineus*	Moderate to severe
	Babesia vulpes (Babesia microti-like, Theileria annae)	Unknown	Mild to moderate
	Babesia conradae	Unknown	Moderate to severe

When to suspect infection?

- Depending on the severity of clinical signs, body systems involved (and the disease), babesiosis can be classified as uncomplicated or complicated.
  - **Uncomplicated babesiosis** has an acute or subacute onset, with mild to moderate anaemia and thrombocytopenia; and there is usually a good response to specific treatment.
  - **Complicated babesiosis** may have a peracute or acute onset with severe systemic inflammatory response syndrome and multi-organ failure. Alongside the specific treatment, complicated disease demands intensive supportive care and has a guarded prognosis.



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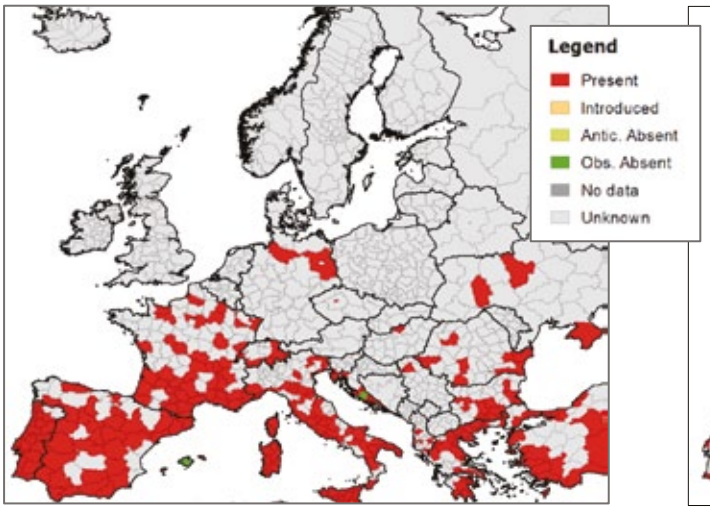
Babesia merozoites in erythorcytes.

Clinical signs

- Lethargy, depression, fever
- Pale mucous membranes (sometimes with petechiae or ecchymoses)
- Jaundice
- Brown or dark-orange coloured urine
- Splenomegaly, hepatomegaly
- Tachypnoea (due to metabolic acidosis)
- Hypotensive shock
- Anuria, oliguria
- Lymphadenomegaly in chronic cases
- Neurological signs (seizures, vestibular syndrome, coma)

Clinical pathology

- Mild to severe anaemia
- Thrombocytopenia
- Auto-agglutination of red blood cells, positive Coombs test (Immune-mediated haemolytic anaemia is the main differential diagnosis)
- Increased concentration of BUN and creatinine, increased activity of liver enzymes, bilirubinaemia.



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Distribution of the tick **Rhipicephalus sanguineus** *(January 2018), vector of* **B. vogeli** *and* **B. gibsoni**

Distribution of the tick **Dermacentor reticulatus** *(January 2018), vector of* **B. canis**

Produced by the FECAVA working group on canine vector-borne diseases in collaboration with ESCCAP and ESDA

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- **Origin / travelling history**
  - Dogs that live in, originate from or have travelled to countries where the parasite is endemic are at risk.
  - Dogs in countries not currently considered endemic should not be considered free of risk.

How can it be confirmed?

- **Blood smear**: Examination of good-quality blood smears stained by Giemsa, Diff Quick or similar stains allow identification of *Babesia* merozoites in red blood cells. Use a freshly taken blood sample taken from the venous blood or the ear pinna. Blood smear examination is less sensitive in chronic infections and in cases of low parasitaemia.
- **PCR**: highly sensitive and specific. The test of choice in chronic cases, subclinical carriers, blood donors and in order to determine the species of *Babesia* causing infection.
- **Serology (IFAT)**: can confirm exposure but not the current state of the infection. It is not species-specific and less useful in everyday practice.
- It is important to confirm or rule out concurrent infections which may be transmitted by the same vector.

Disease management

- In general, small *Babesia* spp. respond less favourably to treatment and are more difficult to eliminate.
- Specific treatment for large *Babesia* species:
  - Imidocarb dipropionate 5.0-6.6 mg/kg SC or IM, two injections 14 days apart, or
  - Diminazene aceturate 3.5 mg/kg IM once. Low therapeutical index.
- Specific treatment for small *Babesia* species:
  - Atovaquone 13.3 mg/kg q8h and azithromycin 10 mg/kg q24h for 10 days, or:
  - Clindamycin 30 mg/kg q12h, metronidazole 15 mg/kg q12h and doxycycline 5 mg/kg q12h
- Supportive treatment:
  - Hospitalization of the dogs should be considered based on their clinical status and careful monitoring of signs of acute renal failure and SIRS is required.
  - Complete blood counts (CBC) and serum biochemistry panel should be evaluated in addition to specific diagnostic tests. Repeat CBC every day. In cases of life-threatening anaemia, blood transfusion should be provided.

Prevention

- **Use of tick preventative products** - transmission is positively related to attachment duration, a product which kills or repels ticks will reduce the risk of disease transmission and the more rapidly this is affected, the greater the protective effect. Choice of product must also be based on compliance, lifestyle factors, owner capabilities and other parasiticide needs for the pet.
- **Checking for ticks** - dogs should be checked for ticks at least every 24 hours in situations of high-risk exposure. Ticks found should be removed immediately without stressing them - this again increases the risk of disease transmission.
- Infested animals should be treated with a **rapidly-acting acaricide** as immature stages of ticks may not be detected while attached to the dog's skin.
- Use of licensed **vaccines** against some of the *Babesia* spp. to reduce the risk of developing severe clinical signs of canine babesiosis
- Consider **imidocarb dipropionate prophylactic treatment**, 6 mg/kg at 8-weekly intervals in highly endemic areas for large *Babesia* spp.

Babesiosis: many ways of transmission