Equine Piroplasmosis

This disease was last reported in Australia in 1976.

B. caballi and *T. equi* are transmitted by ticks, which become infected when they ingest parasites in the blood of infected equids. Approximately 14 species of ticks in the genera *Dermacentor*, *Hyalomma* and *Rhipicephalus* can be vectors for these organisms, however, the epidemiological significance of some species is unknown.

Although ticks are biological vectors for both *T. equi* and *B. caballi*, differences in these parasites' replication cycles can affect their methods of transmission. Ticks that transmit this organism can become infected as larvae and transmit the infection as nymphs, or they can become infected as nymphs and transmit the infection as adults (transstadial transmission). In some species of ticks *T. equi* can also be transmitted by the same tick stage that acquired the parasite. (intrastadial transmission); whether this occurs in other species of ticks is unknown. Equine piroplasmosis can also be transmitted directly between animals by contaminated needles and syringes, or by blood transfusions.

After recovery, horses may become carriers for long periods. Animals infected with *B. caballi* can remain carriers for up to 4 years, but might be able to clear the organism eventually. Equids infected with *T. equi* appear to remain permanently infected. Parasitemia is often absent in carriers, but can reoccur after immuno-suppression or strenuous exercise. *T. equi* can be passed to the foal *in utero*, and some foals can be healthy carriers. Transmission through the placenta of *B. caballi* has rarely been reported, and some sources consider the evidence for this route to be unreliable.

The incubation period for equine piroplasmosis is 12 to 19 days when it is caused by *T. equi,* and 10 to 30 days when it is caused by *B. caballi*.

The clinical signs of piroplasmosis are variable and often nonspecific. *T. equi* tends to cause more severe disease than *B. caballi*.

In rare cases, animals may be found dead or dying. More often, piroplasmosis presents as an acute infection, with

- fever,
- reduced appetite,
- depression
- labored or rapid respiration and congestion of the mucus membranes.
- feces may be small and dry but diarrhea has also been reported.
- Anemia,
- jaundice,
- sweating,
- petechial hemorrhages on the conjunctiva,
- swollen abdomen,
- posterior weakness or swaying may also be seen.

Subacute cases have similar but less severe clinical signs.

- fever may be intermittent
- animals may show weight loss
- signs of mild colic
- mild edema of the distal limbs
- mucus membranes in subacute cases can be pink, pale pink or yellow, and they may have petechial hemorrhages

In chronic cases, common symptoms include

- reduced appetite,
- poor exercise tolerance,
- weight loss,
- transient fevers
- enlarged spleen (palpable on rectal examination).

Some infected mares, including carrier mares, may abort or pass *T. equi* to their offspring. Foals infected *in utero* may be weak at birth, and rapidly develop anemia and severe jaundice. In other cases, these foals can be healthy carriers. Asymptomatic carriers can develop clinical signs after immunosuppression or strenuous exercise.

Post moretom - in acute cases, the animal is usually emaciated, jaundiced and anemic. The liver is typically enlarged and may be either dark orange-brown or pale from anemia. The spleen is enlarged. The kidneys may be pale and flabby, or they may be dark red or black if the animal had hemoglobinuria. Petechial hemorrhages may be seen in the kidneys and subepicardial and subendocardial hemorrhages in the heart. Secondary infections may cause edema, emphysema or signs of pneumonia in the lungs. Reported case fatality rates for equine piroplasmosis vary; one source suggests that the mortality rate can vary from less than 10% to as high as 50%.

The differential diagnosis for piroplasmosis includes surra, equine infectious anemia, dourine, African horse sickness, purpura hemorrhagica, and various plant and chemical toxicities.

Because organisms can be difficult to detect in carriers, serology is often used for diagnosis. Serological tests include complement fixation (CF), indirect fluorescent antibody (IFA) and various enzyme-linked immunosorbent (ELISA) assays. Immunoblotting (Western blotting) can also be used, and an immunochromatographic test for *T. equi* has been described. The complement fixation test can be affected by natural anticomplementary activity in serum, as well as drug treatment or other factors; some carriers can be negative in this test. Animals do not become CF-positive for at least a month after inoculation. For these reasons, the IFA test and competitive ELISA (C-ELISA) have replaced complement fixation for import testing The IFA test can distinguish *T. equi* from *B. caballi*. Polymerase chain reaction (PCR) assays are available but can be unreliable.

Disinfectants and sanitation are not generally effective against the spread of tick-borne infections. However, eliminating contact with ticks and preventing the transfer of blood from one animal to another are vital. In endemic areas, the use of acaricides, together with frequent examination of the animal and immediate removal of any ticks (parasite transmission does not occur immediately), may help prevent infection.

Treatment can suppress clinical signs, but the currently available treatments are ineffective in clearing *T. equi* from carriers. Some studies have suggested that treatment could eliminate *B. caballi* from infected horses; however, in a recent study, this organism persisted in carriers after even high dose treatment with imidocarb. Although this drug could temporarily clear the parasites and resulted in transiently negative PCR results, *B. caballi* DNA was found in horses after the treatment ended. There is no vaccine for either *B. caballi* or *T. equi*.

Some species of *Babesia* or *Theileria* can occasionally infect species other than their usual host, including humans. To date, the most important pathogens for humans appear to be the bovine pathogen *B. divergens* in Europe and the rodent species *B. microti* in the U.S. Although *B. caballi* or *T. equi* may have been implicated in a few human infections in the past, these organisms do not seem to be important zoonoses. However, human babesiosis is still incompletely understood, and the possibility of infection with these organisms has not been ruled out.

Tick carrying the ‘Babesia’ protozoan parasite