Focus Article: Equine Piroplasmosis
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Equine Piroplasmosis (EP) is a potentially fatal tick-borne protozoal infection which affects horses, zebras, mules and donkeys.

EP is endemic in many tropical and subtropical regions such as parts of Africa, Middle East, Asia, Cuba, Central and South America, the Caribbean and southern Europe and it was recently found in parts of southern USA and in a localised outbreak in Ireland in 2009. Countries which are believed to be free of the disease include Australia, New Zealand, Canada and Japan.

One of the most significant characteristics of the diseases is that a carrier state exists providing an unsuspected source of infection for other animals. This is the main reason that it poses such a potential threat to us in the UK. With increasing international movement of horses, the chance of importing a carrier is also increasing. Zebras act as an important reservoir of infection for horses in Africa.

How does the disease develop?
There are two organisms which can cause EP: Babesia caballi and Theileria equi. They have different life cycles but both infect red blood cells where they multiply and cause rupture of the cells, resulting in anaemia and inflammation. They can be present individually or can both be present and causing disease at the same time. Disease caused by T. equi tends to be more severe with a higher mortality rate.

Transmission of the disease between horses is (normally) via a tick vector. At least a dozen known species of tick can spread the infection but fortunately, very few of these are present in the UK. The ticks ingest the parasites when they feed on an infected horse and then pass the parasites when they feed on another horse. Babesia spp can be found in various organs in the tick vector and can be transmitted transovarially from egg to larva. Theileria spp are only found in the salivary glands of the vector ticks. The immature protozoa only mature and become infective after the tick has been attached for several days so prompt removal of ticks can help reduce the risk of infection.

It is important to note that transmission of infection can also occur through blood transfusions and via contaminated equipment and instruments, such as needles, AI instruments, stomach tubes and dental equipment etc. A significant outbreak of EP in the USA in 2009 was traced to blood transfusions and the re-use of needles. The infection can also pass from mare to foal via the placenta prior to birth.

Clinical signs
The incubation period (time between infection and appearance of clinical signs) is 12-19 days for T. equi and 10-30 for B. caballi so it can be up to a month after infection before clinical signs appear and any trace of the infecting tick might be long gone.

The clinical signs vary and are pretty vague as they are similar to those seen in other conditions that cause anaemia and jaundice (yellowing of the membranes). In per-acute cases, the animal might be found dead. The acute form is the most common one seen.
Clinical signs may include fever, loss of appetite, depression, laboured or rapid respiration and congested membranes. You might see obvious anaemia, jaundice, haematuria (dark urine), sweating, haemorrhages in the mouth and inside the vulva, a swollen abdomen and general weakness. Other cases will show less severe signs which might be intermittent such as limb swelling and mild colic with dry droppings. Long term, chronic cases may show only mild signs such as reduced appetite, weight loss and exercise intolerance. Abortions may occur and foals which are infected before birth might die at or soon after birth. Other foals might be born asymthomatic carriers.

Carriers might remain subclinical for life or might develop clinical disease after stress (such as strenuous exercise or travel) or suppression of their immune system, such as can be seen in young foals, old animals and those ill with other disease conditions.

**Diagnosis**

Because the clinical signs are pretty non-specific the differential diagnosis might include purpura haemorrhagica, hepatitis, neoplasia and poisonings (all of which occur in the UK) plus other exotic diseases such as Equine Infectious Anaemia, Surra, Dourine and African Horse Sickness.

In some acute cases, it might be possible to demonstrate the protozoa in blood films affected horses as seen in Fig. 1 but this is difficult and is an unreliable test. The tests of choice are serological. The preferred tests in the UK are the IFAT and the cELISA as both of these are prescribed tests for international trade. The CFT is used in some countries but the result can be affected by many extraneous factors and so some carrier animals will give a negative result. It also can’t be used for at least one month after infection. More recent PCR tests can be used on blood samples to try to detect parasite DNA. These are very sensitive and may be used in conjunction with serological tests or alone.

![Fig. 1: B. caballi identified on a blood film](image-url)
Treatment
Horses which recover usually become chronic carriers for life although many will eventually become clear of *B. caballi*. Horses rarely become clear of *T. equi*, even after treatment. In countries where the disease is endemic a significant proportion of the affected animals are working equids. In such countries infected horses may show little or no signs of disease and so can perform their job at a certain level without becoming ill.

Where finances allow and it is desirable to try to eradicate the parasite from the horse, treatment may be attempted using imidocarb or another babesicide. These drugs are not readily available in the UK but can be imported under special licence. Note that treatment might suppress clinical signs but rarely clears the infection. Severe side effects are common. Even if the parasite can be cleared from the blood, the horse will remain positive on testing for antibody, probably for life. The major significance of this seropositive status is that it significantly reduces the opportunities for sale and export of the affected horse.

Prevention and Control
In endemic countries, control is difficult due to the existence of carrier animals. However tick control with acaricides and by removing any found on the horse can be helpful. Suspected cases must be quarantined immediately. Don’t introduce new animals from an endemic or suspect area/country unless tested first. Ensure adequate hygiene when handling blood products and contaminated instruments. Don’t re-use needles, sterilise all equipment after each use and don’t use blood products from animals which have not been tested for Piroplasmosis.

Risk to the UK
There is little or no regulation and no OIE guidelines regarding the pre-importation treatment of horses for ticks and the Tripartite agreement allows free movement of ‘registered equidae’ between the UK, France and Republic of Ireland. As a result there is real risk of importation of infected ticks on horses and we know that there are species of tick here already which are capable of acting as vectors for EP. We should be recommending treatment for ticks as a pre-importation requirement for horses and a negative EP blood test if the horse has come from an area where the disease is known to occur.