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Emerging tick-borne diseases in horses

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Introduction
Blood-sucking ticks parasitizing animals and humans are found worldwide. Their involvement in zoonotic disease transmission, transmission of microorganisms (viruses, bacteria and parasites) from animal reservoirs to humans, is well known and there is an increased awareness regarding the emergence of these TBD (tick borne diseases) in Europe (1). Over 800 tick species have been described, but only a few of the Ixodes, Rhipicephalus, Dermacentor, Hyalomma, and Haemaphysalis tick species are known to transfer diseases to humans (2). In the Netherlands and in Europe, the most common tick is Ixodes ricinus.

Borrelia burgdorferi and Anaplasma phagocytophilum
Ixodes ricinus ticks may transmit the spirochete Borrelia spp. causing Lyme borreliosis, as well as Anaplasma phagocytophilum and other pathogens (3). The geographic distribution of B. burgdorferi and A. phagocytophilum infections in horses should resemble that of human cases because the vector-tick involved, Ixodes ricinus, feeds on both species and infection with these pathogens have been established in horses many times. The clinical relevance of a B. burgdorferi infection in horses is still unclear, but horse owners and equine practitioners show increasing concerns about this pathogen. A definite diagnosis of the disease “Lyme borreliosis” in horses as well as in human beings and other animals is often difficult to accomplish. Although a broad spectrum of clinical signs has been attributed to B. burgdorferi infections in horses, indisputable cases of equine lyme disease seem to be extremely rare (4). The clinical relevance of an infection with A. phagocytophilum is easier to establish. Infected horses may experience sub-clinical disease or develop overt signs that include fever, depression, in appetite, reluctance to move, distal limb oedema, ataxia and even death. These clinical signs however are not pathognomonic for the disease, and a definitive diagnosis can be achieved by demonstration of granulocytic inclusions, either morulae or initial bodies, in Wright-Giemsa or haematoxylin and eosin (H&E) stained blood smears or the use of molecular techniques like polymerase chain reaction (PCR). Treatment of both “equine lyme borreliosis” as well as equine anaplasmosis consists of giving oxytetracyclin (6.6mg / kg BW q12h).

Babesia caballi and Theileria equi
The Dermacentor reticulatus tick, the vector-tick for B. caballi, T. equi and other pathogens, has a broad distributional range (5). The presence of resident populations of this tick-species in the Netherlands is a novel observation (6) and poses a risk for immunogenic naïve horses in our country. Equine piroplasmosis can occur in acute, sub-acute and chronic forms. Carriers of the disease are often asymptomatic but constitute a potential risk in the transmission of the infection as they serve...
as reservoir. Such positive carrier-horses are present in the Netherlands. Identification of parasites in blood smears provides the definitive diagnosis of equine infection, but bears certain limitations, particularly during apparent or chronic infection due to low parasitaemias. Serodiagnosis by use of complement fixation test (CFT) alone may give false negative test results, especially in horses that are parasite carriers, and has been shown to be less sensitive than the indirect fluorescent antibody test (IFT). Polymerase chain reaction (PCR) proved very useful for the detection of haemoparasites (9), and combined with reverse line blot (RLB) offers the possibility of simultaneous detection and identification of different species infecting horses (10). Imidocarb treatment (2.2mg / kg BW q 24h) of B. caballi infected horses has been shown to eliminate the infection (11,12), but data on the efficacy of this treatment is scarce and more sensitive diagnostic tools have developed over the years. Recent literature suggest that even high dose treatment with imidocarb (4.7mg/kg BW im q 72h) of B. caballi infected horses may not be capable of eliminating B. caballi and T. equi infections from healthy carriers (13). We have to keep in mind that an infection with T. equi often results in life-time carriers and the treatment (imidocarb 4.0 mg / kg BW q 72h) is certainly not without risks. Colic and death may be the consequence of treatment and complete elimination of the parasite if often not achieved despite treatment.

Prevention

Prevention of infection in horses is mainly achieved by looking for ticks and removing them as soon as possible. Preventive measures, in the form of applying tick repellents, which are often taken in domestic small animals, have not been used systematically in horses, because of the unavailability of a registered, safe and efficient product. Environmental factors, such as climate, vegetation type, and abundance of suitable hosts, limit the geographic distribution of the ticks and the pathogens they may carry. Climate changes, certain human activities and behaviour, movements of animals and other factors may lead to changing numbers of ticks and dispersal of the tick population and the pathogens they carry. Such changes may lead to a new status quo of the risk of tick bites for human and animal health. Monitoring tick distribution and the prevalence of tick-borne pathogens in domestic animals (including horses) is important to understand the epidemiology and therefore the risk of tick-borne disease in general. Multidisciplinary strategies addressing these pathogens may also help to implement measures to diagnose, treat and control transmission to humans and animals (14).

References