Oireachtas Committee on Health & Children 21st Nov 2013 : Lyme Disease

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Good morning. My name is Mícheál Casey and I am a veterinary surgeon with extensive experience of tick-borne diseases. I have worked in farm animal practice in the west of Ireland, and in veterinary diagnostic laboratories for over 20 years. I have been asked to attend here today to speak on the prevention and treatment of Lyme Disease. As my background is entirely in veterinary medicine, my presentation focuses on animals rather than on the human & medical aspects, which will be better addressed by medical colleagues.

Lyme Disease & ticks in Ireland
Lyme Disease was first diagnosed in the late 1970s in the US and in the decade that followed, the causal organism, a spirochaete (spiral-shaped) bacterium called Borrelia burgdorferi was identified, and the role of ticks as vectors of these organisms was confirmed.

Ticks are blood-sucking parasitic members of the same class of eight-legged arthropods as spiders. Diseases transmitted by ticks are a major cause of economic loss, disease and deaths in farmed animals worldwide. However Lyme Disease is not regarded as a significant economic tick-borne disease in farm animals.

Tick habitat, questing and seasonality of tick activity
Ticks are not distributed uniformly in Ireland, and even in regions where they occur in large numbers, they have particular habitat requirements within these regions. They need shelter from the elements and a moist microclimate, which they find in under-grazed farmland, and in rough vegetation such as rushes, bracken, and heather.

Ticks have some fairly precise environmental requirements, especially when they leave the relative shelter of the base of the vegetation to find a new host. They find a new host by ‘questing’, where they climb to the tips of the vegetation and grab onto an animal or person going by. They need mild and moist conditions for questing, which are provided in late spring and in autumn in a typical Irish year. This results in clearly defined spring and autumn peaks in tick-borne diseases. On some farms the ticks have become adapted to one or the other season, while on other farms both peaks are seen.

Understanding the type of habitat that ticks favour, and the annual peaks of tick activity in spring and autumn is one part of preventing Lyme Disease. We know when and where the highest risk of exposure will occur, and the sub-populations of animals and humans most at risk.

Lyme disease in Ireland
Lyme Disease was first diagnosed in the late 1970s in the US whereas in Ireland, research has suggested that field mice and some ground-feeding bird species are more important as reservoirs. The infection risk for humans and animals is highest in woodland and nearby pasture. In humans, we know that Lyme Disease causes a fever and a characteristic skin rash. This can progress to cause central nervous system disease, arthritis and blood vessel damage in humans. In animals, the same is true, and the reported cases in the scientific literature worldwide have shown the main clinical signs associated with Lyme Disease in animals consist of skin, neurological and arthritic syndromes, with some involvement of muscle.

Research in other countries indicates that this organism is capable of causing sporadic disease in dogs, cattle and horses. No confirmed cases have been reported from Irish animals to my knowledge, but it is likely that there have been occasional undetected cases in animals here, given how common the organism and the vector are, and how commonly animals are bitten by ticks.
There is some evidence that dogs are at higher risk of Lyme Disease than other animals. However, this may reflect the amount of time they spend in tick habitat, the number of tick bites they get, and the close attention they receive if they get sick – they are more likely to be exposed, and if affected, they are more likely to be detected.

There are a lot of gaps in our knowledge of Lyme Disease in Irish animals that need further research, in terms of the impact of the organism and the prevalence of Lyme Disease in Ireland. This year marks 21 years since barriers to trade in live animals between EU member states were lifted in 1992. It would be timely to survey our tick population to check for the incursion of exotic tick species, and to re-survey ticks for the agent of Lyme Disease to monitor its distribution.

Having said that, we have scientific evidence that points towards exposure to *Borrelia* being widespread in Ireland:

- Blood testing of farmers in Northern Ireland has revealed evidence of widespread occupational exposure to *Borrelia*. This is likely to equally apply to other occupational and leisure users of marginal land and forestry.
- Surveys that captured and tested Irish ticks have shown that many are carrying *Borrelia*.

Tick-borne diseases of Irish animals occur in well-defined areas and habitats. Within these areas, relatively little tick-borne disease is seen in animals despite apparently heavy exposure to a variety of tick-borne pathogens. This is because the exposure to ticks tends to occur from shortly after birth, when the young animal may be protected by maternal immunity passed on in colostrum. In many cases they develop resistance to some of these diseases without getting the disease.

Other factors that impact on whether an animal is infected by a tick-borne disease include the phenomenon of co-infection. If a tick is carrying a pathogen, as well as an immunosuppressive disease - like tick-borne fever for example - then the chances of that pathogen causing disease are increased. This is true of many of our common tick-borne diseases, and it is likely to apply to Lyme Disease too.

**Prevention of Lyme Disease in animals:**
Prevention of tick-borne diseases consists of preventing/reducing the risk of tick bites. Preventive treatment of animals against ticks is commonly employed in high risk areas in Ireland to control the common and economically important tick-borne disease of Irish livestock. Such measures include the use of acaricides on animals to kill ticks and keeping animals out of tick habitat at times of peak tick activity. These measures are probably reducing the risk of Lyme Disease in some Irish animals, but Lyme Disease is not the reason for applying these measures.

**Treatment**
Treatment appears to be relatively straightforward in acute cases, consisting of a short course of antibiotics. The important thing here is awareness, and ensuring that veterinary practitioners are aware of the possibility of Lyme Disease as a differential diagnosis when dealing with an animal showing suggestive clinical signs. This is an area where information campaigns and continuing education can increase the awareness and responsiveness of veterinary practitioners to possible cases.

*That summarises current knowledge of Lyme Disease in Irish animals – I now invite and welcome any questions the committee may have.*