



## Ticks and Lyme borreliosis

**Siobhan Coleman Dip RVN, senior equine nurse, discusses her Lyme disease diagnosis; the transmission of the disease; clinical findings; diagnosis; treatment plans; control and prevention of tick bites**

In October 2017, after more than a year of unusual and debilitating neurological symptoms, I was diagnosed with chronic Lyme disease.

Lyme disease is spread to animals and humans through the bite of a tick infected with the bacterium *Borrelia burgdorferi*. It is not only considered the most prevalent arthropod-borne human disease in Europe and the US, but its incidence appears to be increasing.

In Ireland, the occurrence of Lyme disease in humans is estimated at 50-100 cases per year and since 2012, Lyme neuroborreliosis (disorder of the central nervous system (CNS); a severe neurological manifestation of chronic Lyme disease) accounts for between eight and 18 cases annually. Veterinarians and veterinary nurses need to be aware of the potential risks to their own health when treating animals with tick infestations.

### OVERVIEW OF LYME BORRELIOSIS

Lyme borreliosis (Lyme disease) is a bacterial and viral tick

transmitted disease of animals and humans. The disease is caused by the spirochete, *B burgdorferi*, a class of bacteria characterised by their corkscrew shape and unique spiral motility. Once bitten by a tick, the spirochete is transferred to the host.

In Ireland, the most common tick species is the castor bean tick, *Ixodes ricinus*. It is considered the most important tick-borne disease vector, potentially transmitting tick-borne disease agents between wildlife, livestock, human and pets. Another endemic tick species, which has a broad range of hosts is the hedgehog tick, *Ixodes hexagonus*, which infects cattle, sheep, horses, donkeys, cats, dogs and humans. Ticks do not acquire Lyme disease from deer, as is commonly believed. Rather, they contract the disease as larvae when feeding on infected rodents or birds. Ticks are, therefore, not the causative agent of Lyme disease, they merely harbour and transmit the bacteria.

Ticks prefer certain mammals as their blood meal, such as the white-footed mice or deer, but they will also feed on

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humans and pets. If the tick carries the bacteria, humans and animals may become infected.

The importance of Lyme disease as a zoonotic disease is increasing. More research is required to identify where disease clusters are occurring throughout Ireland and Europe. With the rising numbers of Lyme disease cases in Ireland, greater awareness is required.

If left misdiagnosed or not treated correctly, serious complications may arise in both humans and animals. As well as *Lyme borreliosis*, ticks have many co-infections, such as *Babesia*, *Ehrlichia*, *Anaplasma*, *Mycoplasma*, *Chlamydia pneumoniae*, *Chlamydia trachomatis*, *Rickettsia*, *Yersinia*, Coxsackievirus and EBV/CMV/HSV/VZV. Warmer winters and climate change are thought to account for a surge in tick-borne infections.

In humans, it is a very misunderstood disease with many layered complexities; misdiagnosis is common. Lyme disease can affect any organ of the body including the brain, nervous and cardiovascular systems, muscles and joints.

### CLINICAL FINDINGS

Approximately 50% of people with Lyme disease may develop a characteristic bullseye rash (*Erythema migrans* [EM]) within three to 30 days of infection, appearing as a multiple concentric ring. If this occurs, the disease can be easily diagnosed.

**Stage 1:** This EM rash leads to flu-like symptoms within days/weeks.

**Stage 2:** Months to years later, you may experience migratory joint pain, tingling, spasms, heart palpitations, brain fog, arthritis, migraines, muscle pain and weakness; over 80 symptoms in total.

**Stage 3:** Neurological changes: numbness, tremors, nerve pain, poor temperature control, disturbed sleep patterns. Lyme disease in animals can be more difficult to diagnose and is not usually considered until other conditions have been eliminated. Lyme disease frequently manifests as irritation of skin (itching and biting of skin), fever, lethargy, chronic lameness, lack of appetite and depression. Some pets can be infected for over a year before becoming symptomatic.

The second most common syndrome associated with Lyme

borreliosis is renal failure in animals, which can be fatal. This is characterised by uraemia, hyperphosphatemia, severe protein-losing nephropathy often accompanied by peripheral oedema. Heavy infestations in young animals may result in excessive blood loss resulting in anaemia and, occasionally, death.

### DIAGNOSIS AND TREATMENT

Lyme disease in humans can be incredibly difficult to diagnose due to its ability to mimic other diseases, such as Parkinson's disease, motor neuron disease and multiple sclerosis. Early diagnosis is essential to prevent long-term health issues. Blood tests are available to test for Lyme disease, however these tests can result in false negatives if the patient is tested too early. Similarly, late stage Lyme disease may deplete the immune system causing similar issues with diagnostic testing. Furthermore, antibiotic treatment can adversely affect these tests.

Lyme disease requires a clinical diagnosis which can be supported by serology. Blood tests alone should not be used to rule out Lyme diagnosis. Treatment consists of long term antibiotic therapy, dietary changes, detoxing regimes and alternative medicine protocols to aid in recovery. Approximately 90% of animals may not develop any symptoms. Diagnosis is based on history, clinical signs, elimination of other differential diagnoses, laboratory data, epidemiologic considerations and response to antibiotic therapy. Usually all routine tests return normal except for results pertaining directly to the affected system (eg. soft-tissue swelling, uraemia in renal disease).

In animals, the treatment plan is antibiotic therapy (doxycycline is indicated in all cases with clinical signs attributed to Lyme borreliosis, the standard duration of treatment is four-week treatment plan initially). Additional therapy to support the affected organ systems is also important. Incomplete or transient resolution of signs



Figure 1: Forty-seven ticks found in two sheepdogs.



Figure 2: Tick, which has become gorged after feeding.

may occur in a significant number of affected animals, while some may experience chronic, life-long joint pain from the irreparable damage caused by the bacteria.

### CONTROL AND PREVENTION

Animals that visit the veterinary practice for routine checks should be checked visually for tick infestations. Correct advice needs to be given for owners and their pets health and wellbeing:

- Be tick aware by avoiding wooded and brush areas with high grass and leaf litter, walking in the centre of path trails;
- Use a repellent that contains 20% or higher diethyltoluamide (DEET). Repellents evaporate quickly and must be reapplied frequently;
- Tick populations thrive during spring, summer and autumn;
- An infected tick could potentially crawl from an animal to a person in contact with them;
- Light-coloured clothing should be worn so that ticks are easier to visualise;
- Tuck pants into socks in infested areas;
- Pets should be brushed regularly in order to capture and dispose of ticks correctly;
- Veterinary practices should advise clients on the safe removal of ticks. Removing ticks promptly and correctly is important as the disease does not appear to be transmitted until the tick has fed for a number of hours;
- When removing the tick correctly with a commercial product or small tweezers catch and firmly pull straight out. Protect your fingers using a tissue or disposable gloves;
- If you accidentally crush the body of the tick and release its bodily contents on your skin, be mindful that the spirochete, which causes Lyme disease, has the ability to pass through a cut or a wound on the skin;
- A small tick bite can cause massive health issues, so learn to protect yourself and your pets.

### READING LIST

Tick Talk Ireland, [www.ticktalkireland.org](http://www.ticktalkireland.org)  
 Zintl A, Moutailler S, Sturat P et al. Ticks and tick-borne diseases in Ireland. Irish Veterinary Journal 2017  
[www.irishvetjournal.biomedcentral.com](http://www.irishvetjournal.biomedcentral.com)  
 MSD Veterinary Manual, [www.msdvetermanual.com](http://www.msdvetermanual.com)  
 Pathway Medicine, [www.pathwaymedicine.org](http://www.pathwaymedicine.org)  
 Lyme Disease Guide, [lymediseaseguide.net](http://lymediseaseguide.net)  
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Figure 3: Different tick sizes.



Figure 4: Bullseye rash