Survey of pet dogs indicates Lyme disease risk much greater than previous estimates suggest

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Ticks infected with the bacteria that cause Lyme disease may be considerably more prevalent in the UK than expected, according to new research from the University of Bristol that used pet dogs as 'sentinels' for human disease risk.

Transmitted by ticks, Lyme disease is a debilitating chronic infection which affects a number of animals including humans and dogs. It is caused by the bacterium Borrelia burgdorferi. Clinical signs in humans include a characteristic circular red rash that spreads from the site of the tick bite, followed by a flu-like condition. In dogs, the symptoms can be much more vague and difficult to diagnose. If untreated, the disease progresses to neurological problems and arthritis; chronic forms of the disease can last for many years.

While only occasionally affecting humans, reported cases in the UK are thought to have increased more than fourfold since the beginning of the century - from 0.38 per 100,000 in 2000 to 1.79 per 100,000 in 2009. In 2010 there were 953 reported cases in England and Wales but the level of under-reporting is likely to be considerable.

To obtain a clearer picture of the prevalence of infected ticks, Faith Smith of Bristol's School of Biological Sciences and colleagues recruited vets across England, Scotland and Wales to examine dogs selected at random as they visited veterinary practices. Since pet dogs largely share the same environment and visit the same outdoor areas as their owners, exposure to infected ticks in dogs is likely to provide an index for corresponding risks to humans.

Of 3,534 dogs inspected between March and October 2009, 14.9 per cent had ticks. Of the samples that could be tested, 17 were positive for the Borrelia bacteria. Hence, 2.3 per cent of ticks were infected. Therefore, the prevalence of infected ticks on dogs is 0.5 per cent, or 481 infected ticks per 100,000 dogs. This suggests that the prevalence of Borrelia in the UK tick population is considerably higher than previously thought.

Faith Smith said: "Lyme disease appears to be a rapidly growing problem in the UK with important health and economic impacts in terms of loss of working hours and potential decrease in tourism to tick hotspots.

"Without considerably better surveillance and routine diagnostic testing, Lyme disease is only likely to become more prevalent. In particular, future warmer winters might well extend the period over which ticks are active seasonally, while growing wild reservoir host populations, such as deer, will allow the tick population to expand."

The study is published today in the journal *Comparative Immunology, Microbiology and Infectious Diseases*.

More information: 'Estimating Lyme disease risk using pet dogs as sentinels' by Faith D. Smith, Rachel Ballantyne, Eric R. Morgan, and Richard Wall in *Comparative Immunology, Microbiology and Infectious Diseases.*

Provided by University of Bristol