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Lyme borreliosis-a preventable infection

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Bacterium Borrelia burgdorferi can cause Lyme disease. The Infecting organism is a tick-borne spirochete which is an important zoonosis. The infection is a serious threat to travellers in Europe and North America. Tick infestation is common in several parts of the UK with many parts of the Scottish Highlands and Forest areas in England now affected. Hill and Forest walkers, cyclists and even picnickers are all at risk. In northern Europe there is also high risk of tick-borne encephalitis. People who are bitten are not always immediately aware of the bite. The tick secretes an anticoagulant and anti-inflammatory into the skin and pain and inflammation often do not occur until 36 hours after the tick has become attached to the skin. Health professionals and patients do not always recognise the potential hazards related to tick bites.

LB was first described after an outbreak of juvenile arthritis in a township in Connecticut in 1975 which was found to be related to ticks in the local deer population. Tick infestation is a major problem for travellers visiting large areas of the eastern United States and summer months with great swaths of the countryside often prohibited to visitors. Many cases of LB are reported from these areas and health professionals are very much aware of early identification of bites and appropriate management.

In Scotland over 200 people per year have positive serology but many more cases go unrecognised and a much greater disease burden is reported by GPs and A&E units where people first present.[1]

Some present with a single tick bite or multiple bites and others with a skin rash or erythema migrans. The response to the presentation is variable,, with many nurses and doctors refusing to recognise that the tick bite brings a threat of later neurological disease. Ticks may not be removed or if removed leave head parts in the skin and no follow-up or antibiotic is prescribed. Erythema migrans also often goes unrecognised and its significance ignored. When bites are taken seriously, serology is rarely carried out and results can be confusing with false positives and negatives. 4.2% of blood donors in Scotland in one study showed positive line serology with a high regional prevalence in the in the north and west with the greatest prevalence of 8.6% in the Highlands. It is thought that some natural immunity is developing in local populations.[2]

In the UK the oxidase richnis tick transmits the Borrelia spirochete after transferring from grasses infected by rodents, the year, squirrels birds and sheep.[3] Recently chipmunks introduced into the Paris area which have spread widely in France and become colonised in southern England have been shown to be carrying infected ticks. Foreign visitors feeding the chipmunks have suffered from tick bites. Foresters estate workers hillwalkers and those performing outdoor activities are at greatest risk but vacationers having a picnic, on a forest walk, or gardening in the affected areas can easily be bitten and later contract LB. Tick bites go under reported and identified by nurses and doctors and mismanaged. The potential for serious later manifestations goes unrecognised. Prompt removal of the tick can prevent development of primary LB. Tick bites do not always result in borreliosis with perhaps only 10% of ticks affected. However it is not uncommon for hillwalkers in the Scottish Highlands to return with several bites increasing the risk that one may infected.

Ticks have a two year life-cycle and are incredibly resistant to extremes of environment. They can go months without feeding, can resist severe cold and heat and even a washing cycle in a washing machine when attached to clothing. Cases are reported in housewives exposed to ticks when lifting infested clothing and bitten when washing family members socks and trousers inhabiting ticks.

The tick is transferred from bracken and glass fronds to the passing walker and claims legs to attach itself to feet, legs, thighs and lower body. Some reports suggest that the higher up the body the tick in-beds and the nearer to the head and neck the growth is the greater the risk of serious neurological complications later. Once the skin is invaded, the tick engorges blood for the next few hours and the first most people are aware that they have been bitten is after 24 to 48 hours, when the bite becomes itchy and scratchy occurs. Personal attention is drawn to scratching the tiny lump on the skin, on which closer examination reveals as a black, tiny insect when the tick has engorged with blood. The tick falls off when fully engorged after four or five days and itching will disappear a few days later. The Herald patch of erythema migrans may then appear some days later. Tick bites and erythema can attract attention if on visible parts of the anatomy, but they can also be easily missed when they are on the back and the legs of individual. For this reason also they may not be easily removed unless the patient seeks an assistant. The tick can be removed with fine forceps or a specialised instrument on sale commercially. It is very important that the entire insect be removed and in particular embedded head parts. If the head is left fixed, the skin the risk of transmission of disease is higher.

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Prompt removal of the tick within 24 to 36 hours makes transmission of infection unlikely. The presence of erythema migrans merits attention of a doctor or nurse and current policy is to treat with an antibiotic if the erythema migrans is greater than 3 cm in diameter. The provision of an antibiotic for tick bites is very variable with doctors and nurses refusing to recognise its significance for later neurological manifestations of Lyme disease. Doxycycline 100 mg twice a day for 2 to 4 weeks is recommended with many still prescribing oxytetracycline instead. The Herald patch of erythema migrans, a circular pink –red inflammatory area of skin round the area bite, may appear shortly after the bite or sometime later. Antibiotics should not be prescribed prophylactically for a simple tick bite. Doxycycline can be nephrotoxic in those with poor renal function.

Confirmation of Lyme disease can prove difficult. It often gets confused with chronic fatigue syndrome but onset cranial nerve palsy including Bell's palsy should raise suspicion of Lyme borreliosis if the patient has visited a tick infested hotspot. Sensory and motor symptoms which suggest multiple sclerosis should prompt consideration of Lyme borreliosis, as should new onset of mono arthritis in knees, ankles or wrists. Blood tests can be difficult to interpret as they are a record of previous exposure. A rise in titre can suggest a recent infection however. Cerebral spinal fluid can be tested using PCR techniques for Lyme borreliosis.

Summary

There is a continuing need for frequenters to known tick infested hot spots to be vigilant and take measures to prevent been bitten. This means avoiding the use of short trousers or skirts and wearing long trousers tucked in at the ankles, the use of insect repellent and showering and bathing after return from such locations. They should be aware of the significance of the Herald patch and report it to health professionals. The latter should be aware of the risk of tick bites and later Lyme disease and identify and recognise the significance of the Herald patch and erythema migrans. Although not all tick bites carry infection, health professionals should be aware of the risk, give attention to multiple bites and be prepared to respond with appropriate antibiotic with the appearance of erythema migrans of large diameter. Health professionals and the general public often remain unaware of the risk in near Europe and much of Highland Scotland and parts of England and Wales from tick bites and the possibility of later Lyme disease.

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