Lyme Disease Clinical Guidance

There are around 20 species of tick in the UK. This guidance focuses on *Ixodes Ricinus*, the most common to bite humans in the UK. Ticks can transmit a variety of diseases to humans but this guidance focuses on *Borrelia burgdorferi* the cause of Lyme Disease.

Risk of Tick Bites and Transmission of Lyme

Ticks are predominantly found in grassy or wooded areas but these can also include urban parks and gardens.

The highest risk months are typically April to June and early Autumn as this is when Nymphal (young) ticks are most active and these carry a higher risk of transmitting Lyme disease as they are small and harder to spot on the skin resulting in longer attachment time on the skin which increasing the risk of transmission. Adult ticks are active year-round but more active over the summer months.

In the UK, Southern England and the Scottish Highlands have particularly high prevalence of Lyme Disease. Outside the UK, it is more prevalent in parts of northern, Eastern and Central parts of Europe, USA, Canada and parts of Asia.

Prompt identification and correct removal of Ticks can help reduce the risk of developing Lyme Disease:

- Regular checks for ticks after being outdoors and wearing light coloured clothing helps to identify ticks
- Promptly and correctly removing ticks when found reduces risk of transmission. This is done by grasping the mouthpiece closes to the skin with fine tip tweezers or a tick removal tool and pulling directly upwards
- Useful resources for educating the general public on Tick avoidance and what to do in the event of a Tick bite can be found via the link. 'Be tick aware' toolkit (publishing.service.gov.uk)

Before diagnostic tests are requested, a patient's risk of exposure to ticks should be properly assessed and the clinical history evaluated for features compatible with Lyme borreliosis.

Full guidance of Lyme Disease Testing and Treatment can be found in the NICE Guidelines on Lyme Disease 2018: Overview | Lyme disease | Guidance | NICE

Presentations of Lyme Disease

Erythema Migrans

- Erythema migrans is a distinctive circular rash at the site of the tick bite. It usually occurs 3 to 30 days after being bitten and is often described as looking like a bull's-eye on a dart board. The affected area of skin will be red and the edges may feel slightly raised. The size of the rash can vary significantly and it may expand over several days or weeks. Typically, it's around 15cm (6 inches) across, but it can be much larger or smaller than this.
    - Some people may develop several rashes in different parts of their body, not at the site of the tick bite. one in every three people with Lyme disease do not report seeing a rash.

Photo: 'Be tick aware' toolkit (publishing.service.gov.uk)

- No laboratory testing is required to confirm the diagnosis in the presence of erythema migrans, the recommendation is to treat empirically -see NICE Guidelines for treatment.

Other Presentations of Lyme Disease

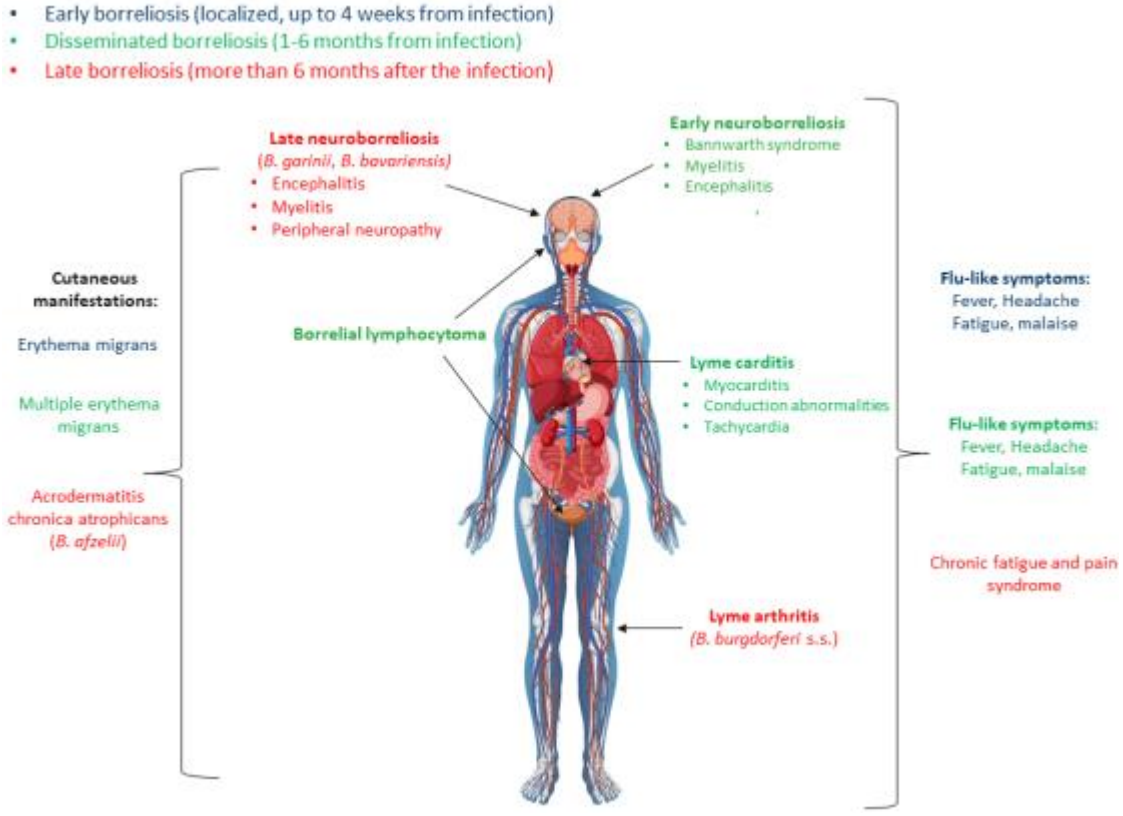
Consider Lyme Disease as a possible but uncommon cause, in people with several of the following symptoms:

- fever and sweats
- swollen glands
- malaise
- fatigue
- neck pain or stiffness
- migratory joint or muscle aches and pain
- cognitive impairment, such as memory problems and difficulty concentrating (sometimes described as 'brain fog')
- headache
- paraesthesia.

Focal Lyme Disease

Consider Lyme disease as a possible but uncommon cause in patients presenting with focal symptoms such as:

- Inflammatory arthritis
- Neurological Symptoms: e.g. Bell's Palsy, Meningitis, radiculopathy, neuropsychiatric symptoms
- Cardiac symptoms such as heart block and pericarditis
- Eye symptoms such as uveitis and keratitis
- Skin rashes e.g. Acrodermatitis atrophica chronicans



Testing for Lyme Disease

- There are 2 main types of tests used for Lyme Disease.
    - ELISA - tests for either IgM or IgG antibodies depending on clinical details.
    - Immunoblot - testing is used to confirm positive or equivocal ELISA IgM or IgG results. It involves testing for specific proteins found in *Borrelia burgdorferi* at a regional UKHSA Reference Laboratory. Occasionally, immunoblot may be used to rule out Lyme Disease in cases where people have had a negative ELISA IgM/IgG but possible symptoms of Lyme Disease which have persisted for >12 weeks.

    - Treatment should only be initiated for those with positive tests performed by a UKAS accredited laboratory. If a patient has a positive test result from a non-approved laboratory of non-validated test then tests should be performed as above prior to commencing treatment.
- Timing of tests for Lyme.
    - Testing should occur no sooner than 4-6/52 following tick bite/symptom onset. Testing earlier than this especially < 4 weeks can result in false negatives as it is too early for the antibody response to have developed. If someone was tested prior to 4 weeks and had a negative result, but high clinical suspicion of Lyme Disease, then a repeat test can be done after the 4-6/52 from symptom onset is recommended to look for seroconversion.
- Required Clinical Details:
    - date of tick bite (if known tick bite)
    - date of symptom onset
    - nature of symptoms
    - country in which tick bite occurred
    - how long tick was attached before removal

  Samples received **without this information** may be stored without testing, so inclusion with the request prevents delay

  DO NOT OFFER TESTING TO THOSE WITH A HISTORY OF TICK BITE BUT NO SYMPTOMS OF LYME DISEASE

- Negative Tests. If testing after at least 4-6 weeks from symptom onset and result shows IgG positive but IgM negative ***or*** IgG negative IgM positive ***or*** IgG negative IgM negative then consider repeating test in 4 weeks in first instance if symptoms persist to rule out seroconversion in a developing infection.
- If symptoms persist despite a negative ELISA and there is still ongoing concern regarding the possibility of Lyme Disease after 12 weeks of symptoms then a Lyme Immunoblot can be requested. If this too is negative an alternative diagnosis should be sought.
- Positive Tests should be treated for Lyme Disease as per NICE Guidelines [Recommendations | Lyme disease | Guidance | NICE]

How reliable are ELISA's used to test for Lyme Disease?

An audit of Lyme Disease testing in 2021-23 in the RDUH Microbiology Department showed IgG positive and IgM positive were confirmed by immunoblot testing in 96% of cases (100% in previous study in 2018) whereas samples which were IgM positive but IgG negative were only found to be positive on immunoblot in 11% of cases.

Ongoing Symptoms following Treatment for Lyme Disease

If following appropriate treatment for Lyme Disease, a patient has persistent or worsening symptoms. Explain that symptoms can take weeks to months to resolve after treatment. Consider whether ongoing symptoms may be due to the following:

- Re-infection. Treat as appropriate.
- Treatment Failure e.g. interruption of treatment or failure to complete treatment. Consider offering an alternative course of antibiotics.
- Organ damage cause by Lyme disease e.g. Nerve palsy

Chronic Lyme Disease – Post-Treatment Lyme Disease Syndrome (PTLDS)

The vast majority of those diagnosed with Lyme Disease are successfully treated with antibiotics. However, in a small number of patients, symptoms can persist.

The term "Chronic Lyme Disease" has be used by patients to refer to a range of conditions from people with ongoing symptoms following diagnosis and treatment with Lyme Disease, but can also be used to describe symptoms where there has be no definitive clinical evidence of current or past infection with Lyme Disease on approved laboratory testing. Therefore, the term Post-Treatment Lyme Disease Syndrome (PTLDS) is now being used to describe patients with evidence of Lyme Disease who continue to experience symptoms at least 6 months following appropriate treatment of Lyme Disease.

Management of PTLDS

A variety of symptoms may persist in PTLDS but common symptoms include fatigue, chronic pain, paraesthesia and memory impairment or "brain fog". These are often very debilitating and distressing for patients and can be difficult to manage as there is no definitive treatment.

Sometimes patients may request treatment with prolonged courses of antibiotics on the basis of anecdotal evidence of improvement in those with similar symptoms following Lyme treatment. In the absence of re-infection NICE does not recommend more than two courses of antibiotics for those with ongoing symptoms following treatment.

Three National Institute of Allergy and Infectious Diseases funded placebo-controlled clinical trials looked at whether prolonged courses of antibiotics for treating PTLDS. These studies showed no benefit of prolonged antibiotic treatment over placebo. They did however, demonstrate the impact of these symptoms on patient's physical health and quality of life.

Treatment of these patients should be aimed at managing symptoms and excluding alternative diagnoses.

If you wish to discuss a case of suspected or confirmed Lyme Disease including PTLDS for further advice you can contact Microbiology on rduh.microconsultants@nhs.net

References

1. https://www.nice.org.uk/guidance/ng95/chapter/Recommendations
2. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1149305/Be_tick_aware_toolkit.pdf
3. https://www.niaid.nih.gov/diseases-conditions/chronic-lyme-disease
4. https://www.cdc.gov/lyme/postlds/index.html