Lyme disease - The Northern Irish Story

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Introduction

Lyme disease is an illness caused by the spirochete Borrelia burgdorferi. NICE guidance suggests an approach to diagnosis resting on clinical presentation, presence in an epidemiologically plausible area, and positive serology. It is however, well documented that serological diagnostics in European Lyme disease is problematic, symptomology is wide and geographically plausible areas are difficult to define. There is a movement for Lyme advocacy, a voice that emphasizes the poor diagnostics in this infection. With the spotlight on Lyme disease, we are increasingly seeing patients presenting in Northern Ireland across a broad range of specialties. We therefore undertook an observational study looking at patients who tested positive serologically for Borrelia burgdorferi using the EIA Diasorin commercial assay.

Methods

2013
511 positive serology results
Diasorin Liason XL EIA

Randomly selected 300
Serology audit

2018
Randomly selected 150
Detailed analysis of clinical details (excluded 13 as no information available)

Demographics

187 females: 14 males
Age range 5 weeks to 85 years
Median age 36 years

Samples spanned all 5 secondary care Health and Social Care Trusts with predominance in Belfast second only by primary care samples.

Serological testing results
- IgM positive total
- IgG positive Total
- IgG and IgM positive
- IgM positive ALONE
- IgG positive alone
- C6 Peptide Positive

**Map Demonstrating distribution by locality of patients testing seropositive by EIA Diasorin for Borrelia burgdorferi in Northern Ireland**

Clinical Results

Serology results
- Symptoms: 62% erythema migrans
- Site noted: 81% NI
- Site local to bite: 73%
- Travelled outside NI prior to symptoms: 36%
- Treated: 63%
- Repeat serology: 45%
- Alternative diagnosis: 18%

Map demonstrating travel history of seropositive patients

Alternative Diagnosis by order of occurrence
- Multifocal leukoencephalopathy
- Inflammatory arthritis
- Discoid/ discoid lupus
- Fibromyalgia
- Migraine
- CVA
- Encephalitis of another diagnosed cause
- Guillain Barre
- Intracranial hypertension
- Other

Graph Showing frequency of symptoms in seropositive patients

*Conclusion*

The results only further highlight the complexities of diagnosis in Northern Ireland. We studied a cohort of 300 patients who have tested either IgM and/or IgG positive for Borrelia burgdorferi. In line with national guidelines samples that test positive via EIA targeted at V1sE antigen undergo confirmatory testing.

Of the 300 patients only 63 were confirmed C6 peptide positive and of these only 36 were immunoblot positive. It is likely that this highlights a significant false positive rate in the V1sE EIA.

This is further complicated by the approach in the NICE guidance of wide symptomology and that the patient does not need to have a documented bite to justify testing. The most common presenting symptoms were sensory disturbance, this is followed closely by headache and fatigue and then arthralgia. 20% of patients had a documented bite from a tick but only 4% of those were actually bitten in Northern Ireland. Around 40% of patients had travelled outside of Northern Ireland prior to symptoms but interestingly this increases to 73% when we look at patients who had confirmatory C6 peptide positivity (i.e. the clearest Lyme serological evidence). Nearly 60% of people had an unpalatable alternative documented diagnosis.

This observational study further highlights the common presenting symptoms that prompt Lyme Disease testing. It also highlights the likely low seropositivity in patients in NI. Of the 511 positive samples in 5.5 years. Of these positive tests our study underlines the probability that many of these positive results are cross reactivity, given the high rate of alternative diagnoses.

Where Lyme Disease was given as a final diagnosis and was treated, there is a high rate of travel outside of Northern Ireland and low rate of significant tick bites locally. This is likely to represent a low prevalence of Lyme disease in Northern Ireland; however, without more robust diagnostics it is difficult to say this with any certainty.