Lyme disease on the acute medical unit
a case series at a southern English
district general hospital

Background
Infection with the spirochaete Borrelia burgdorferi (Lyme Borreliosis) is the most common human tick-borne zoonosis in the United Kingdom (UK). The vectors are a number of closely-related hard-bodied ixodid ticks (Ixodes ricinus complex). Commonly known as ‘sheep ticks’, or ‘deer ticks’, the feeding hosts include many species of wild and domesticated mammals, birds and some reptiles. Humans may be incidental hosts at any stage of ixodes life cycle.

UK national enhanced surveillance data demonstrate annual increases in the incidence of laboratory diagnoses of Lyme borreliosis from 268 cases in 2001 to 972 cases confirmed in 2011. Lyme borreliosis may be asymptomatic, and is often treated clinically without serological testing, so these figures are accepted to underrepresent the true incidence. The clinical manifestations (Lyme disease) are multisystemic and may present with early localised, early disseminated, or late disease.

Lyme borreliosis is prevalent in the temperate zones of North America, Europe and Asia, with sporadic cases elsewhere. Much of the published epidemiological data reflects disease patterns in the United States of America (US) where Borrelia burgdorferi sensu stricto is the major pathogenic species. Within the UK and Europe, Borrelia garinii and Borrelia afzelii are the responsible for most Lyme disease though other genospecies can cause clinical disease. Collectively, these genospecies are classed as Borrelia burgdorferi sensu lato. As a result of these differences in infecting genospecies, the natural history and clinical manifestations of Lyme disease differ in Europe compared to North America.

We present data summarising the presentation of Lyme disease at an acute hospital in the UK.

Methods
Demographic data and clinical presentation were recorded from patients with serologically confirmed Lyme disease presenting to the Royal Hampshire County Hospital, Winchester from 1992-2012.

Results
446 cases of Lyme disease were identified. 210/446 (47%) male with a bimodal age distribution (peaks during the 1st and 6th decades of life – Figure A). 232/446 (52.0%) of patients described a preceding tick bite. Of those patients who recalled a tick bite, 16 (6.9%) described being bitten while abroad (12 Europe, 3 North America, 1 Central America – these patients were excluded from subsequent analyses).

Presentation demonstrated a significant seasonal variation, favouring the UK summer months of June-August (Chi square test p<0.0001). Data on time of tick bite (n=109) and time of first clinical symptom (n=197) followed the same seasonal distribution. Median time from tick bite to first symptom was 15 days (inter-quartile range 9-28 days). The median time from first symptom to diagnosis was 14 days (inter-quartile range 2-31 days).

The first symptom described by the patients are described in Figure C. Clinical findings at presentation were rash (71%), neuroborreliosis (26%, of whom half had VII cranial nerve palsies), arthropathy (7%), pyrexia (5%), cardiac abnormalities (1%) or other manifestations (<1%). Where presentation was accompanied with rash, usually erythema migrans, the lower limb was the most commonly affected site.

Discussion & Conclusions
Lyme disease is prevalent at this UK district general hospital. Winchester lies in mid Hampshire, in close proximity to endemic areas for Lyme borreliosis - the heathland environment of the South Downs and the New Forest. Other UK sites with high reporting of Lyme disease include Exmoor, parts of Wiltshire & Berkshire, Surrey & West Sussex, Thetford Forest, the Lake District and the North York Moors.

Cases of Lyme disease occur throughout the year. Time of tick bite, time of first clinical symptom and time of diagnosis follow a seasonal variation, with a peak in the early summer months, coinciding with major ixodes tick feeding activity.

Our data are consistent with previous observations in European (Slovenian) Lyme disease, where median incubation period from tick bite to erythema migrans has been reported as 17 days. Our findings suggest there is a further interval between first symptom and clinical diagnosis of 14 days. There is no previous comparable published data from the UK. Time to onset of symptoms is shorter in US observational studies at 11 days, and is likely to reflect the different pathogenic genospecies of borrelia.

US Centers for Disease Control and Prevention (CDC) data also demonstrates a similar bimodal age distribution with peaks at age 0-10 years and 40-70 years. The reason for this observation remains unclear, but may relate to health seeking behaviour.

Half of patients describe a preceding tick bite and 71% have a rash at presentation. The dermatological manifestations of Lyme disease predominantly affect the lower limbs.

Neuroborreliosis was present in 26% at presentation and demonstrates a predilection for involvement of the facial nerve. Arthropathy is present in 7% of patients, less than in comparable US studies and consistent with our limited knowledge of the effect of genospecies on manifestations of disseminated disease (Borrelia burgdorferi sensu stricto, the genospecies most strongly associated with Lyme arthritis is rare in the UK but the most common pathogenic species in the US).

Cardiac involvement (myocarditis, conduction abnormalities) is uncommon and in our experience, usually transient.

Clinical suspicion and recognition of the various presentations of Lyme disease are important for the acute physician.

References

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