

## Lyme-Like Illnesses

In view of the increasing public health risk from tick bites, and indeed from other arthropod bites, the committee should consider broadening the scope for intervention and management of Lyme disease to include "Lyme-like" borreliosis infections, as well as all possible infections from the many other pathogenic microbes being identified in ticks;(1) even if only for the purposes of accurate differential diagnosis.

There is growing evidence from support groups in the UK that patients have multiple tick-borne infections: please see Lyme Disease UK web site and Veronica Hughes CEO Caudwell Lyme Co., where the data shows that the NHS is failing to detect and treat these infections.

Daniel Cameron MD, (<http://danielcameronmd.com/coinfections/>) observes: Co-infections can be challenging to diagnose, as clinical features often overlap with many of the other tick-borne diseases, including Lyme disease. However, the importance of identifying and treating polymicrobial infections is critical in getting a patient well.

Practitioners should consider co-infections in the diagnosis when a patient's symptoms are severe, persistent, and resistant to antibiotic therapy. Physicians have found that co-infections typically exacerbate Lyme disease symptoms.

The most "Lyme-like" symptom presentations from tick-borne infections are due to infections with members of the large family of borrelia spirochetes.

In Brazil during the last 10 years, a Lyme-like disease has been identified which is indistinguishable from Lyme, termed Baggio-Yoshinari syndrome (2), and similarly, in the southern states of the USA, there is Master's disease or Southern Tick-Associated Rash Illness (3)

Willy Burgdorfer wrote in 1998 that Relapsing Fever is far more widely distributed than was realised, and hardly anyone was looking for it. He found that most patients who had antibodies to the relapsing fever, caused by *B. hermsii*, were serologically positive for *B. burgdorferi*, and Western Blotting consequently demonstrated false positivity of testing for *Borrelia burgdorferi* (4)

In Britain, we know that at least 13 million birds, carrying over 1 million ticks, arrive in Britain from Africa every Spring (5). Africa has the highest prevalence of relapsing fever borrelia strains, and of human illnesses and deaths due to the infection. It is reasonable to conjecture that relapsing fever strains of borrelia have been introduced into the British Isles by bird ticks, and consequently into the ecosystem.

It has recently been shown by Public Health England that *B. miyamotoi* is present in Britain in *Ixodes* ticks. *B. miyamotoi* is genetically related to tick-borne relapsing fever (TBRF) strains. However, in clinical presentation, it can appear more like Lyme borreliosis.

In North America, researchers have shown that, in 182 cases of febrile illness from ticks, presenting as very similar to Lyme disease, most patients who were eventually found to have antibodies to *B. hermsii* were serologically positive for *B. burgdorferi*, and it was only the second tier testing (Western blot) that demonstrated false positivity of testing for *B. burgdorferi*. "This study demonstrates that TBRF is underrecognized and underreported and may be falsely identified as Lyme disease" (4).

Similarly, Scoles et al in 2001 found that yet another TBRF strain in the US was transmitted by *Ixodes* ticks (6)

Of greatest relevance to Britain, European scientists Richter et al have found a third strain of the relapsing fever borrelia in Europe and state "We now know that a third member of this group infects *I. ricinus* ticks in central Europe. We conclude that each of the various kinds of ticks that serve as vectors for Lyme disease spirochetes, *I. ricinus*, *I. persulcatus*, *I. scapularis* [= *dammini*], may be infected by relapsing fever-like spirochetes" and they state "Exposure risk for relapsing fever-like spirochetes is similar to that of certain Lyme disease genospecies." (7)

Many patients report to us that they have had positive results on the initial ELISA tests for Lyme disease, but that subsequent Western blot tests have proved negative. It seems possible that they might have been in fact infected with a TBRF strain, even one that is as yet unrecognised, which would have produced such test results.

Thus it is necessary to include the TBRF illnesses into the scope of this committee, as they may be indistinguishable from Lyme disease.

## References

### 1) Co-infection of Ticks: The Rule Rather Than the Exception

Sara Moutailler, Claire Valiente Moro, Elise Vaumourin, Lorraine Michelet, Florence Hélène Tran, Elodie Devillers, Jean-François Cosson,, Patrick Gasqui, Van Tran Van, Patrick Mavingui, Gwenaél Vourc'h, Muriel Vayssier-Taussat.

PLOS Neglected Tropical Diseases | DOI:10.1371/journal.pntd.0004539 March 17, 2016

### 2) [Brazilian lyme-like disease or Baggio-Yoshinari syndrome: exotic and emerging Brazilian tick-borne zoonosis].

Yoshinari NH1, Mantovani E, Bonoldi VL, Marangoni RG, Gauditano G.

Rev Assoc Med Bras. 2010 May-Jun;56(3):363-9.

<http://www.ncbi.nlm.nih.gov/pubmed/20676548>

### 3) [http://www.columbia-lyme.org/patients/tbd\\_stari.html](http://www.columbia-lyme.org/patients/tbd_stari.html)

### 4) Tick-Borne Relapsing Fever in the Northwestern United States and Southwestern Canada Dworkin, M. Anderson S.D.E,Jr, Schwan,T.G., Shoemaker, P.C., Banerjee, S.N., Kassen, B.O., and Burgdorfer, W.

Clinical Infectious Diseases 1998;26:122–31 Tick-Borne Relapsing Fever in the Northwestern United States and Southwestern Canada T  
<http://cid.oxfordjournals.org/content/26/1/122.full.pdf>

5) Population estimates of birds in Britain and in the United Kingdom.  
Br. Birds. (Stone et al., 1997)  
<https://www.britishbirds.co.uk/wp-content/uploads/2010/12/APEP3.pdf>

6) A Relapsing Fever Group Spirochete Transmitted by Ixodes scapularis Ticks.  
Scoles, G A; Papero, M; Beati, L and Fish, D. Vector Borne and Zoonotic Disease  
Vol.1 Number 1, 2001.

7) Relapsing Fever–Like Spirochetes Infecting European Vector Tick of Lyme  
Disease Agent. Dania Richter, Daniela B. Schlee, and Franz-Rainer Matuschka.  
Emerging Infectious Diseases • Vol. 9, No. 6, June 2003