

# Lyme Borreliosis: Epidemiology and Diagnosis (Recommendations of the Swiss Society for Infectious Diseases)

## Summary Part I (Full review articles in German [1-3] or French [4-6])

Lyme disease is tick borne and transmitted by nymphs and adult ticks of the genus *Ixodes ricinus*. In Switzerland up to 40-47% of the ticks are infected. The causative species are *Borrelia burgdorferi sensu stricto*, *garii* and *afzelii*, which are summarized as *Borrelia burgdorferi sensu lato*. Despite the fact that *B. garii* is more neurotropic and *B. afzelii* more dermatotropic, all three species have the capability to cause any of manifestations of Lyme disease.

Clinical manifestations are protean and nonspecific. Exclusion of other causes is always necessary. Case definitions, adapted from the EUCALB, CDC and from studies, should guide physicians. Basically diagnosis should be made clinically and confirmed by serology, where possible.

The mainstay of microbiological diagnosis is serology, as cultures need tissue biopsies and can only be used for cutaneous manifestations. The slow growth of *Borrelia* in culture, over several weeks, limits their clinical usefulness. Serology depends on the performance of a sensitive screening test, which has always to be confirmed by western blot. False positive screening tests are frequent and occur with other infections and immunologic diseases. False negative screening tests are seen during the early stages or can be caused by insensitive kits. The sensitivity of serology depends on the stage of disease. It is only 50% for Erythema migrans. For the early disseminated stages (benign lymphozytoma, early neuroborreliosis, carditis, arthritis ) serology has a sensitivity of 80%, which rises to 100% for chronic arthritis and chronic neuroborreliosis. As the background seropositivity in the population is between 10 and 35%, a positive result is never a proof of infection. In early neuroborreliosis intrathecal antibody production can occur before antibodies can be detected in serum. The diagnosis of neuroborreliosis depends on detection of intrathecal antibody production, with the exceptions of Bell's palsy and peripheral neuropathy. Due to the persistence of positive IgG and IgM even after successful treatment, serology cannot be used for follow up. PCR is useful only for the diagnosis and follow up of Lyme-arthritis. Urinantigen tests should not be used. Lymphocyte stimulation tests have a high rate of false positive and negative results.

## Versions in German:

1. Evison J, Aebi C, Francioli P, Péter O, Bassetti S, Gervaix A, Zimmerli S, Weber R (2005) Abklärung und Therapie der Lyme-Borreliose bei Erwachsenen und Kindern: Empfehlungen der Schweizerischen Gesellschaft für Infektiologie. Teil 1: Epidemiologie und Diagnostik. Schweiz. Ärztezeitung 86:2332-2338.
2. Evison J, Aebi C, Francioli P, Péter O, Bassetti S, Gervaix A, Zimmerli S, Weber R (2005) Abklärung und Therapie der Lyme-Borreliose bei Erwachsenen und Kindern: Empfehlungen der Schweizerischen Gesellschaft für Infektiologie. Teil 2: Klinik und Therapie. Schweiz. Ärztezeitung 86:2375-2384.
3. Evison J, Aebi C, Francioli P, Péter O, Bassetti S, Gervaix A, Zimmerli S, Weber R (2005) Abklärung und Therapie der Lyme-Borreliose bei Erwachsenen und Kindern: Empfehlungen der Schweizerischen Gesellschaft für Infektiologie. Teil 3: Prävention, Schwangerschaft, Immundefizienz, Post-Lyme Syndrom. Schweiz. Ärztezeitung 86:2422-2428.

## Versions in French:

4. Evison J, Aebi C, Francioli P, Péter O, Bassetti S, Gervaix A, Zimmerli S, Weber R. Borrélieuse de Lyme. 1ère partie: épidémiologie et diagnostic. Rev Med Suisse 2006;2:919-24.
5. Evison J, Aebi C, Francioli P, Péter O, Bassetti S, Gervaix A, Zimmerli S, Weber R. Borrélieuse de Lyme. 2e partie: clinique et traitement. Rev Med Suisse 2006;2:925-34.

6. Evison J, Aebi C, Francioli P, Péter O, Bassetti S, Gervaix A, Zimmerli S, Weber R. Borréliose de Lyme. 3e partie : prévention, grossesse, états d'immunodéficience, syndrome post-borréliose de Lyme. Rev Med Suisse 2006;2:935-40.