

Vector-Borne Diseases: Impact of Climate Change on Vectors and Rodent Reservoirs
Berlin, 27 & 28 September 2007

Lyme borreliosis: Data and trends

PD Dr. Gabriele Poggensee and Balazs Fülöp, Robert Koch Institute, Berlin, Germany

Introduction

Lyme borreliosis (LB) is the most prevalent human tick-borne illness of the northern hemisphere and is caused by the spirochete *Borrelia burgdorferi*. LB is a multisystem infection affecting skin, nervous system, joints and heart. LB is a curable disease; however, if early disease manifestations are overlooked or misdiagnosed, LB may lead to severe neurological complications and chronic arthritis. In Europe, all known human pathogenic genospecies are prevalent and there is evidence for varying clinical presentations of Lyme borreliosis caused by these different genospecies.

Data bases

In many European countries LB is not a mandatory reportable disease. In the majority of countries, data is collected through diagnostic laboratory reporting. Other sources of incidence estimates include voluntary reporting, GP/physician surveys, and hospital in- and out-patient diagnoses (1).

In Germany, LB is not a notifiable disease; however, the six eastern German states (Berlin, Brandenburg, Mecklenburg-Western Pomerania, Saxony, Saxony-Anhalt and Thuringia) have extended notifications systems including Lyme borreliosis. Cases fulfilling the case definition are transmitted electronically from the local health authorities via the intermediate health authorities to the Robert-Koch-Institute (clinical picture of erythema migrans or early neuroborreliosis laboratory confirmed by the presence of lymphocytic pleocytosis in cerebrospinal fluid and detection of intrathecally produced specific antibodies or detection of nucleic acids or detection of *B. burgdorferi* by culture).

Data and Trends

Since the 1990s the number of reported cases has increased in Europe and the geographical regions have expanded. The highest incidences within Europe are seen in the Baltic States and Sweden, Austria, the Czech Republic, Germany, Slovenia, and central Europe. In Southern Europe, incidences appear to be much lower. However, focal areas of higher incidences can occur in countries where the incidence is generally low (1).

In Germany, between 2002 and 2006 a total of 23.170 cases has been reported; the majority presenting the clinical picture of erythema migrans (n = 20.787). The incidence increased from 17.8 cases per 100.000 inhabitants in 2002 to 37.3 cases per 100.000 inhabitants in 2006. The highest incidences were seen in counties in Brandenburg (especially in the

eastern part), Saxony (Erz Mountains, Upper Lusatia Region) and Thuringia (Thuringian forest) and Mecklenburg-Western Pomerania (island of Rügen). The patients' ages were bimodally distributed, with a first incidence peak among children and a second peak among adults starting in the fourth decade with a maximum in the 60 to 65 years age group. A total of 92% of the reports had data on the onset of symptoms. Illness started in the majority of cases between the months of June to September (2). In 2005 and 2006 the proportion of reported onset in the months September to November increased, in these years tick activities were prolonged due to a warm autumn as well as a mild winter (3).

Conclusion

The surveillance systems of Lyme borreliose differ largely between the European countries; therefore comparisons of epidemiological data on LB are notoriously difficult. The available data indicate that the incidence of LB may have increased markedly in various European countries assuming that the surveillance systems have been stable. An array of factors possibly leading to the increased incidences have been identified including ecological and climatic changes, changes in human settlements, recreational behaviour, but also increasing awareness of the general population and physicians resulting in an increased number of notified cases. To what extent the different factors contribute to the increased incidences is not known. The time-series data available from the European countries cover only a relatively short time interval and might not reflect long-term trends.

1. Smith R et al. (2006) Lyme borreliosis: Europe-wide coordinated surveillance and action needed? *Eurosurveillance* 11(5).
2. RKI (2007): Zur Situation der Lyme-Borreliose in den sechs östlichen Bundesländern: Analyse der Meldedaten aus dem 5-Jahreszeitraum von 2002 bis 2006. Im Druck.
3. Dautel H et al. Winter activity of *Ixodes ricinus* in a Berlin forest area. IX International Jena Symposium on Tick-Borne Diseases, Jena, 15.-17. März 2007.

PD Dr. Gabriele Poggensee and Balazs Fülöp
Robert Koch Institute
Dept. Infectious Disease Epidemiology
Seestraße 10
13353 Berlin
Germany