

EP0222

ePoster Session

New pathogen discovery and diagnostic evaluation

Borrelia miyamotoi in Finland

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Background: *Borrelia miyamotoi* (Bm), a spirochete causing relapsing fever like illness, has recently been identified as a human pathogen. It is transmitted by the same *Ixodes* ticks that transmit *Borrelia burgdorferi* sensu lato (Bbsl) bacteria causing Lyme borreliosis. In Finland, the prevalence and geographic distribution of Bm in ticks is at present unknown. Also, the Bm seroprevalence in Finnish people is not known, and there are no identified Bm infected patients in Finland.

In this work our aim was to study the prevalence of Bm in ticks collected from different geographical areas in Finland, and compare the Bm prevalence with that of Bbsl. Furthermore, we wanted to investigate the seroprevalence of Bm antibodies among Finns, and to identify possible Bm infected patients.

Material/methods: A total of 1000 ticks including 500 *Ixodes ricinus* and 500 *Ixodes persulcatus* collected widely around Finland during the year 2015 were screened by PCR for the presence of Bm and Bbsl. Tick samples were analyzed using real-time PCR assays targeting Bm flagellin gene and *ospA* gene of Bbsl. Positive samples in Bm flagellin gene PCR were further analyzed by conventional PCR assays targeting the *glpQ* and *p66* genes.

Serum samples in the seroprevalence study are archived samples from the Department of Medical Microbiology and Immunology at the University of Turku. Antibodies against Bm GlpQ antigen using an ELISA assay will be analyzed in serum samples of individuals with a suspected tick bite and in various control samples.

Results: According to our preliminary results, Bm was found in 3 out of 1000 (0.3%) ticks which is roughly in accordance with results of tick pathogen prevalence studies conducted in neighboring countries, Sweden, Estonia and Russia. The infection rate of Bm in *I. ricinus* ticks was 0.2% (1/500) and in *I. persulcatus* 0.4% (2/500). Ticks that were tested positive for Bm were collected from different locations in Finland. These three tick samples were positive in both the real-time PCR targeting the flagellin gene and the conventional PCRs targeting the *p66* and *glpQ* genes. Of the 500 analyzed *I. ricinus* and 500 *I. persulcatus* ticks, 79 (16.3%) and 99 (20.4%) were positive for Bbsl, respectively. Co-infections with Bm and Bbsl were not detected.

Serum sample analyses and the identification of potential Bm infected patients are ongoing.

Conclusions: The findings indicate that *B. miyamotoi* is endemic also in Finland and thus should be considered as a potential tick-borne pathogen causing relapsing fever like illness among patients with a history of a tick bite.