New tick disease in Switzerland

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Microbiologists from the University of Zurich have detected a new disease transmitted via tick bites. The patients suffered from fever, weight loss and malaise, but could be cured fully with a course of antibiotics. Thanks to a newly developed test, the bacterial infection can be detected within a day. The greater Zurich region is a risk area for the new tick disease.

Until now, we knew that ticks primarily transmit two pathogens to humans in Switzerland: the bacterium *Borrelia burgdorferi* – which causes borreliosis – and the early-summer-meningoencephalitis virus, which can cause cerebral inflammation. Now, microbiologists from the University of Zurich confirm the existence of another tick disease in Switzerland – neoehrlichiosis.

The pathogenic bacteria *Candidatus Neoehrlichia mikurensis* was first discovered in ticks and rodents in Europe and Asia in 1999. In 2010, Head of Molecular Diagnostics at the Institute of Medical Microbiology Guido Bloemberg and colleagues from Sweden and Germany diagnosed the world's first infections in humans and dubbed the disease "neoehrlichiosis", by detection of the bacterium in the patients blood. Two more cases were identified at the University of Zurich's Institute of Medical Microbiology in October 2011 and January 2012. So far, a total of eight patients have been described in Europe, three of whom come from the Zurich area. They suffered from relapsing fevers of up to 40 degrees, weight loss and general malaise.

Greater Zurich region risk area

Bloemberg's team studied around 2,000 ticks from the neighborhood of the three Swiss patients, who often spent time in forests and fields. The result: A large number of ticks in the Zurich area – five to ten percent – carry *Candidatus Neoehrlichia mikurensis*. "Our study shows that the greater Zurich region is a risk area for neoehrlichiosis, especially for immunocompromised people," explains Florian Maurer from the University of Zurich's Institute of Medical Microbiology. Almost all the patients in Europe to date have had a weakened immune system. However, people with a healthy immune system recently contracted neoehrlichiosis from a tick bite in China, too.

New test detects infection quickly

"Because the bacteria that cause neoehrlichiosis couldn't be bred in the lab until now and thus no rapid tests were available, many infections might have remained undetected," says Guido Bloemberg. However, help is now at hand with the new DNA test the researchers have developed: It can detect an infection definitively within one working day and also be used for larger test series.

The Swiss patients could be cured fully with a course of antibiotics. Within only a few weeks of beginning the treatment, the microorganism responsible could no longer be detected in their blood. "How well the bacterium is transmitted to humans via a bite from an infected tick, however, still needs to be researched," concludes Bloemberg.

More information: Florian Maurer, Peter Keller, Christian Beuret, Cornelia Joha, Yvonne Achermann, Jaques Gubler, Daniele Bircher, Urs Karrer, Jan Fehr, Lukas Zimmerli, Guido Bloemberg. Close geographic association of human neoehrlichiosis and tick populations carrying Candidatus Neoehrlichia mikurensis in Eastern Switzerland. Journal of Clinical Microbiology, 31 October, 2012. Doi: 10.1128/JCM.01955-12

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