# TBE patients' lasting problems

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Host-seeking blacklegged tick. Credit: Centers for Disease Control and Prevention (CDC), CC0

Impaired memory, reduced motivation, and declining motor skills. These are some of the problems that may persist several years after people contract tick-borne encephalitis, a University of Gothenburg thesis shows.

Tick-borne encephalitis (TBE) is caused by a virus, found in parts of Europe and Asia, that is spread mainly by tick bites. Though rare, in recent years the disease has become successively more prevalent in Sweden, some 300 cases are reported annually.

The new thesis contains studies of TBE patients diagnosed with the disease in western Sweden between 1997 and 2017. The author, Malin Veje, gained her Ph.D. at Sahlgrenska Academy, University of Gothenburg, and is an infectious disease specialist at Sahlgrenska University Hospital.

One purpose of her doctoral studies was, by following up TBE patients over a long period after discharge, to investigate the symptoms they continue to be affected by in the long term. The participants' problems proved to be of widely differing kinds.

Ninety-two former TBE patients were interviewed in median five and a half years after contracting the disease. It emerged that the interviewees had significantly more problems—in terms of memory, concentration, initiative, and motivation—than a control group. Other difficulties were those caused by persistent impairment of their fine motor skills, balance, and coordination, and headaches.

Fatigue, another significant problem, was studied through polysomnography in 22 previous TBE patients and 20 controls. Despite equivalent sleep patterns and similar proportions of people with sleep apnea, the former TBE patients suffered from more fatigue and greater impact on daily life.

"Quite a number of them have difficulties in everyday life. To remember what they have to do, they need to write things down and set their phone alarms on a scale that they hadn't needed to do before," says Malin Veje.

"Of those who are of working age, many find it difficult to work. They can't concentrate, their multitasking ability has decreased, they don't get started on tasks, and they get extremely tired. What's more, a lot of them have motor problems to do with balance and fine motor function."

TBE can be prevented with a vaccine, but there is no actual cure. Almost all the patients studied had been hospitalized for their infection, with a high temperature and varying degrees of impact on the brain. The median hospital stay was eight days.

The thesis also contains studies of TBE diagnostics based on 129 cases in which existing methods, along with testing for immunoglobulin G (IgG) antibodies in cerebrospinal fluid and polymerase chain reaction (PCR) using blood samples, proved to work well. Studies of the immune system's responses to the disease are also included.

"It's highly probable that the body's immune response is partly responsible for inflicting the damage. So future therapies may need to consist of a combination of antiviral and immunomodulatory medication," Veje concludes.

**More information:** Tick-borne encephalitis—clinical and virological aspects: gupea.ub.gu.se/handle/2077/66820

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