TBE NEWS

DEADLY TBE CASES CAUSED BY SIBERIAN AND EUROPEAN SUBTYPES REPORTED FROM FINLAND

Background

According to phylogenetic studies, the TBE virus is usually classified into three subtypes – the European (Western) subtype (TBEV-EU), the Siberian subtype (TBEV-Sib) and the Far-Eastern subtype (TBEV-FE). In Western, Central, North, South and Eastern Europe, TBEV-EU is prevalent, while TBEV-Sib has been detected in most parts of Russia, including Western and Eastern Siberia, the Far East, Mongolia, Kazakhstan and Kyrgyztan. However, TBEV-Sib is expanding to the western direction and has been found in the Baltic countries and Finland. The principal vector for TBEV-EU is *Ixodes ricinus*, while TBEV-Sib is usually found in *I. persulcatus*.

Results

Two fatal TBEV infections acquired 1 month apart in patients on Kuutsalo Island, Kotka archipelago, Finland, were reported.

- **Patient 1:** In 2015, a 36-year-old woman had visited Kuutsalo Island, Kotka archipelago (east of Helsinki). She developed TBE a week later. CSF and serum were positive for TBEV IgM. The patient died two weeks after fever onset. Postmortem analyses showed widespread and severe signs of viral encephalitis. TBEV could be isolated from the cerebellum and the whole genome for TBEV-Sib was obtained. Sequence analysis revealed it being nearly identical to strains isolated from *I. ricinus* ticks collected in 2011 from a neighboring island.
- **Patient 2:** A 66-year-old man has frequently been bitten by ticks while at his cottage on Kuutsalo Island. He developed severe TBE, and one week after hospitalization, TBEV IgM could be detected in his CSF. The patient died four weeks after hospitalization. Postmortem examination revealed TBEV RNA in the brain and complete genome for TBEV-EU was sequenced from the cerebellum. Two years later, a total of 80 ticks were collected from Kuutsalo Island and one tick, collected near the patient's cottage, was positive for TBEV RNA. TBEV genome from the tick was sequenced and was nearly identical to the TBEV genome from the patient's brain.

Discussion

In Finland, TBEV-EU has been found atypically in *I. persulcatus* ticks, and TBEV-Sib in *I. ricinus* ticks. The detection of TBEV-EU from patient 2 was unexpected in a well-known TBEV-Sib focus on Kuutsalo Island. The findings of the authors suggest that TBEV-EU and TBEV-Sib co-circulate in the Kotka archipelago in *I. ricinus* ticks and raises concern for further spread in Europe.

Literature

Kuivanen et al.

Fatal tick-borne encephalitis virus infections caused by Siberian and European subtypes, Finland, 2015.

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