

## ETIOLOGY AND EPIDEMIOLOGY OF TICK-BORNE ENCEPHALITIS. A REVIEW

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**Summary.** This article presents a review of the literature on tick-borne encephalitis virus and epidemiology of tick-borne encephalitis.

Tick-borne encephalitis virus (TBEV) is a member of the *Flaviviridae* family. The most important antigen of TBEV is the envelope protein E, which induces protective immunity, functions as the ligand to the cell receptors and is responsible for the virulence of TBEV. TBEV consists of three subtypes: the European, Far Eastern and Siberian. Despite very similar antigen structure the virulence of different subtypes of TBEV differs.

The main vector of TBEV are *Ixodes* spp. ticks. Ticks can be infected by viremic, non-viremic, transovarial and transstadial transmission. Non-viremic transmission of TBEV is the most important for the maintenance and spreading of TBEV in natural foci. 0.1-26.6% of ticks are infected with TBEV within endemic areas.

More than one hundred animal species, including mammals, birds and reptiles, can serve as hosts of the ticks, which are divided into reservoir, indicator and accidental hosts. Small rodents are the main reservoir of TBEV. TBEV prevalence in small rodents is in a range from 15 to 47.9%. Birds are not important as reservoir hosts, but can spread the virus into new areas.

The incidence of tick-borne encephalitis (TBE) in Europe has increased 4 times over the last three decades. The reasons of the increase in incidence of TBE are complex and associated with expanding vector and host populations, influenced by global warming. Other reasons are social, economical and associated with human activities. Increased awareness of tick-borne diseases, improved diagnostics and epidemiological surveillance also influence the increasing number of TBE cases.

**Keywords:** tick borne encephalitis, tick borne encephalitis virus, *Ixodes* ticks, natural foci, prevalence, morbidity.