



SEQUELAE FOLLOWING TBE VIRUS INFECTION

Background:

The course and prognosis of sequelae resulting from tick-borne encephalitis (TBE) virus infection have been shown to vary depending on factors such as the route of infection, virus subtype, coexisting medical conditions and medications, genetic predisposition, and age. While children are often reported to exhibit milder symptoms and a lower incidence of long-term complications compared to adults, emerging evidence suggests that children may still experience a considerable disease burden. In some cases, persistent or lifelong symptoms contribute significantly to the overall impact of the illness, particularly among younger age groups.

To better understand the current knowledge on TBE-related sequelae, a systematic review of the literature was conducted. This review investigated the prevalence of persistent symptoms following hospital discharge among individuals with TBE across various populations, studies, and follow-up durations.

Results:

A comprehensive literature search was conducted for clinical studies published in any language from 2007 to May 2024. The included studies involved infections with the European TBE virus subtype, confirmed through laboratory testing in accordance with the criteria of the European Centre for Disease Prevention and Control (ECDC). Studies were categorized by follow-up duration after patient discharge: ≤ 6 months, 7–12 months, and > 12 months.

Following full-text screening, 15 studies met the inclusion criteria. Of these, six focused on adult populations, five on children, and four included mixed-age cohorts. Reported rates of sequelae varied widely both across and within age groups: from 20.6% to 100% in adults, 1.7% to 69% in children, and 16.3% to 51.2% in mixed-age studies.

The meta-analysis revealed substantial heterogeneity among the studies. Across 10 studies, a total of 79 different symptoms were documented. Among the 20 reported neurological sequelae, balance disorders and headaches were the most common. Over time, an increase in the proportion of patients with sleep disturbances/insomnia was observed, while a decline was noted in the prevalence of handwriting deficits, speech impairment, paresis, and disturbances of consciousness.

The most commonly reported neuropsychiatric sequelae were concentration and memory disorders. Other frequently cited symptoms included impaired activities of daily living, irritability, muscle pain, dizziness, asthenia, and sexual dysfunction. In a small pediatric cohort, both irritability and difficulties with daily living were found to increase over time following discharge.

Certain symptoms were unique to specific age groups. In adults, sequelae included bladder dysfunction, cerebellar syndrome, radiculitis, psychotic and psychoorganic symptoms, and sexual dysfunction. In children, reported symptoms exclusive to this group included attention problems, exaggerated reflexes, electroencephalographic abnormalities, and declines in school performance.

Persistent headaches were common across all age groups, and memory impairments were observed to persist long-term in both children and adults.

Discussion:

TBE virus infection can result in a wide range of persistent sequelae, including behavioral disturbances, speech and memory impairments, chronic headaches, and prolonged sleep disorders. In children, these sequelae can significantly disrupt daily functioning, academic performance, and other critical aspects of cognitive development.



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Despite growing awareness, knowledge regarding the effects of TBE virus infection on the developing brain remains limited.

Overall, the evidence indicates that patients may experience a broad spectrum of neurological, neuropsychiatric, and other long-term symptoms more than a year after initial hospitalization, highlighting the need for long-term follow-up and supportive care strategies.

Literature:

Halsby et al.

Clinical Spectrum and Dynamics of Sequelae Following Tick-Borne Encephalitis Virus Infection: A Systematic Literature Review. *Open Forum Infect Dis.* 2025;12(6):ofaf317. doi:10.1093/ofid/ofaf317

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