



LONG-TERM OUTCOMES OF TBE IN LATVIAN PATIENTS

Background:

The clinical course of TBE virus infection can result in a wide spectrum of clinical manifestations, ranging from asymptomatic infection and mild febrile illness to severe meningoencephalitis with potentially life-altering neurological complications. The acute phase of the disease has been well described. However, sequelae following acute illnesses, which can occur even in patients with relatively mild disease, are less well studied. Some studies indicate that more severe acute neurological involvement is associated with higher rates of sequelae. A better understanding of the burden and predictors of sequelae is essential for improving patient management, guiding follow-up strategies, and informing public health interventions, including vaccination policies.

A study was conducted in Latvia, a Baltic country with a high incidence of TBE, to evaluate the clinical characteristics, long-term outcomes, and predictors of sequelae in patients with TBE.

Results:

This retrospective cohort study with prospective follow-up included 105 adult patients with TBE who were admitted to hospitals in Latvia between 2018 and 2024. Acute disease severity was assessed according to the classifications proposed by Bogovič and Mickienė and categorized as mild, moderate, or severe. Sequelae were defined as post-encephalitic syndrome (PES) according to the Bohr criteria.

The mean age of the 105 patients was **51.4 ± 13.6 years**, and **58 (55.2%)** were female. Concomitant Lyme disease was present in **9 patients (8.6%)**. Most patients were unvaccinated (**98/105; 93.3%**), and **57 (54.3%)** had at least one comorbidity. Most cases occurred between June and September.

Fever (**100/105**) and headache (**92/105**) were the most common symptoms. According to the **Mickienė** classification, **70.3%** of patients had

mild disease, **22.8%** had moderate disease, and **6.9%** had severe disease. According to the **Bogovič** classification, the corresponding proportions were **67.6%**, **24.8%**, and **4.8%**, respectively.

Sequelae were observed in **49.5%** of patients and were more frequent in patients with meningoencephalitis than in those with meningitis (**72.0% vs 42.9%**). Most patients with PES had mild sequelae (**80.8%**), while **19.2%** had moderate sequelae. No cases of severe sequelae were observed.

The most common sequelae were difficulty concentrating (**63.5%**), fatigue (**55.8%**), and sleep disturbances (**40.4%**). Neurological sequelae included tremors (**44.2%**), vertigo (**21.2%**), and hearing impairment (**9.8%**). Quality of life, assessed using the **EQ-5D-5L (Version 3)**, was impaired in **32.7%** of patients.

Patients with sequelae were older, and age correlated with disability at hospital discharge. Biphasic disease was not significantly associated with the severity of sequelae. Patients with moderate or severe disease had a higher frequency of PES than those with mild disease. The presence of neurological signs was associated with a higher frequency of PES, and paresis was strongly associated with greater severity of sequelae.

Discussion:

This study demonstrated that nearly half of the hospitalized patients with TBE developed long-term sequelae, most commonly mild neurocognitive impairment. Age was the primary independent predictor of worse outcomes. Acute neurological manifestations, particularly paresis and tremor, were strongly associated with poorer long-term outcomes. These findings highlight the substantial burden of PES and the need for **structured** long-term follow-up of patients with TBE.



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Literature:

Grosa et al. *Long-term outcomes in adult patients with tick-borne encephalitis in Latvia. Pathogens.* 2026;15:672. doi:10.3390/pathogens15070672

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