

# Tick-borne encephalitis and Lyme disease can lead to chronic illness

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In an effort to better understand the role of the immune responses in the clinical course and post-treatment outcome of tick-borne encephalitis (TBE), Bogovi? and colleagues “assessed 24 cytokines and chemokines associated with innate and adaptive (T and B cell) immune responses.” A black-legged (*Ixodes spp*) tick can transmit tick-borne encephalitis and Lyme disease.

The study entitled [Inflammatory Immune Responses in Patients with Tick-Borne Encephalitis: Dynamics and Association with the Outcome of the Disease](#) compared the levels of inflammatory mediators during acute illness and later at follow-up time points “to evaluate whether immune responses at each time point were associated with the outcome of the disease.”<sup>1</sup>

## 1 in 3 patients with chronic symptoms

The authors found that “at least 30% of patients develop a post-encephalitic syndrome (PES), and approximately 5% are affected by permanent pareses.”

These patients report having “persistent symptoms such as fatigue, arthralgias and myalgias, headache, dizziness, sleep disorders, emotional lability, memory and concentration disorders, etc., termed PES.”

Post-encephalitic syndrome may be due to “inappropriate activation of host immune responses following [tick-borne encephalitis virus] infection,” the authors suggest.

Furthermore, this “immune response may take months to years to return to homeostasis.”

“These findings provide new insights into the immunopathogenesis of TBE [tick-borne encephalitis] and implicate inflammatory immune responses with post-encephalitic syndrome years after the initial infection,” the authors conclude.

## Tick-borne encephalitis and Lyme disease

- A black-legged (*Ixodes spp*) tick can transmit infectious pathogens causing both TBE and Lyme disease.
- Although there is no antiviral treatment for TBE, antibiotics can be used to treat Lyme disease and many of the co-infections.
- There is currently a vaccine for tick-borne encephalitis. But the vaccine to prevent Lyme disease and co-infections was voluntarily taken off the market in 2002.

Individuals with tick-borne encephalitis can also be infected with *Borrelia burgdorferi*. In one study, “62 (9.1%) [patients] had proven co-infection with borreliae and 240 (35.1%) had possible co-infection,”

writes [Velušček](#).<sup>2</sup> Meanwhile, proven borrelial co-infections have been reported even higher (13.5% and 16.7%) in other studies, writes. Velušček.

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**References:**

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2. Velušček M, Blagus R, Cerar Kišek T, Ružičič-Sabljič E, Avšič-Županc T, Bajrovič F, Stupica D. Antibiotic Use and Long-Term Outcome in Patients with Tick-Borne Encephalitis and Co-Infection with *Borrelia burgdorferi* Sensu Lato in Central Europe. A Retrospective Cohort Study. *J Clin Med*. 2019 Oct 20;8(10).

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