

Tick-Borne Encephalitis

Traveler Summary

Key Points

- | Tick-borne encephalitis (TBE) is a viral infection acquired through the bite of an infected tick. The infection occurs in many forested rural and suburban areas of Central and Eastern Europe as well as northern Asia.
- | Risk behaviors include hiking, camping, and other outdoor activities, from April through December, in forested rural, suburban, and urban parkland areas of TBE-infected countries.
- | Symptoms begin with an influenza-like illness that includes fever, headache, muscle aches, and fatigue.
- | Consequences of infection in a small subset of people include brain inflammation and nervous system complications that appear several days after fever subsides.
- | Prevention includes wearing long, light-colored trousers tucked into boots when hiking as well as observing personal protective measures against tick bites.
- | TBE vaccine, not available in the U.S. or Canada, may be given in 2 or 3 doses, usually over a period of 1 year. Accelerated dosing over several weeks is available on arrival in many infected destinations.
- | Vaccine side effects are most commonly mild to moderate local reactions.
- | Duration of vaccine protection is 3 to 5 years; booster is required with continued risk.

Introduction

Tick-borne encephalitis, a viral infection that can affect the nervous system, is caused by the bite of infected *Ixodes* sp. ticks in forested areas of Europe and Northern Asia.

Risk Areas

TBE occurs in focal areas of Europe and Asia, extending from eastern France to northern Japan and from northern Russia to Albania. Although Russia has the largest number of reported cases annually, Czech Republic, Estonia, Latvia, Lithuania, Slovenia, and western Siberia have the highest frequency of infection. Many central European countries, particularly Germany, Austria, Switzerland, and Poland, have significant foci of infection.

Three subtypes of TBE virus (European, Far Eastern, and Siberian) circulate, with the latter 2 being the most virulent.

Most cases occur from April through December. Exposure is restricted to forested areas with adjacent grasslands, forest glades, riverside meadows, marshlands, parks, and gardens, up to an altitude of about 1,500 m (4,900 ft), with most cases occurring in areas with an altitude of less than 750 m (2,500 ft). TBE-infected ticks infesting areas of wooded suburbs and peri-urban and urban parks have been reported in Europe, Scandinavia, Baltic States, Russia, and China. Incidence seems to be increasing in the Scandinavian countries.

Transmission

The TBE virus is transmitted in the saliva of biting ticks in endemic areas. Although ticks may stay attached for several days, transmission can occur within seconds of being bitten, unlike the 36 to 48 hours typically associated with Lyme disease transmission. Rarely, the virus is transmitted by consuming unpasteurized dairy products from infected farm animals, especially goats. TBE is not transmitted from person-to-person.

Risk Factors

Risk behaviors include hiking, camping, or participating in other outdoor activities in rural, forested areas of TBE-risk countries or walking in peri-urban and urban parks in some northern European towns.

Symptoms

Symptoms include a nonspecific influenza-like illness (fever, headache, muscle aches, and fatigue), usually resolving in a few

days. However, some cases proceed to a second phase that can be very serious, with fever accompanied by nervous system symptoms and muscle paralysis. TBE is more severe in people 50 years and older.

Consequences of Infection

The Far Eastern subtype causes a more severe disease course than the other subtypes, with a higher rate of nervous system complications and death. The Siberian subtype frequently causes a chronic or progressive disease.

Need for Medical Assistance

Travelers who develop a generalized illness or marked local reaction within 2 to 3 weeks of a known tick bite should seek medical advice. No cure is available for TBE.

Prevention

Nonvaccine: When in a risk area, observe the following tick precautions:

- | Wear long trousers tucked into boots when hiking; ticks are easier to spot on light-colored clothing
- | Apply DEET (N,N-diethylmetatoluamide) directly to skin
- | Use permethrin-containing compounds on clothing, camping gear, bed netting, and screens
- | Avoid camping at sites close to animal habitation and sleep in screened tents
- | Perform a thorough body search and remove any ticks, preferably with forceps, to reduce the risk of infection after visiting a tick-infested habitat
- | Avoid unpasteurized dairy products, especially goat milk

See *Infestations in Travelers*.

Vaccine: Vaccination may be indicated for travel to some countries. Travelers who cannot obtain TBE vaccine in their home country should make arrangements to receive the vaccine upon arrival at their destination, if possible. TBE vaccines are not available in the U.S. and Canada but are available in Europe and Australia.

Persons with underlying medical conditions or who have concerns about the vaccine should speak to their health care provider before vaccine administration.

Side Effects: Side effects are usually mild to moderate local reactions (redness and swelling at the injection site). Fever, headache, fatigue, dizziness, nausea and vomiting, diarrhea, and muscle aches have been reported in some people receiving this vaccine. Fever, which is common in very young children, occurs occasionally in older children and is infrequent in adults.

Timing: 2 or 3 doses are given for the primary series, usually over a period of 1 year. Depending on the vaccine used, doses are given at 0, 1-3 months, and 5-12 months after dose 2; or at 0 and 1-7 months, followed by a booster 12 months after dose 2. Several accelerated schedules, which require at least several weeks to be effective, are also available. Long-stay travelers arriving in peak season at a destination with available vaccine might consider an immediate, accelerated vaccine series.

Boosters are given 3 to 5 years later if at continued or new risk.

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