Tick-Borne Encephalitis

Traveler Summary

Key Points

- Tick-borne encephalitis (TBE), a viral infection occurring in focal areas of Europe and Asia, is acquired through the bite of an infected tick.
- Risk exists for travelers hiking, camping, or engaging in outdoor activities in affected countries, especially during the months of April through November.
- Symptoms include fever, headache, muscle ache, and fatigue.
- Consequences of infection can include brain inflammation, nervous system complications, muscle paralysis, and death.
- Prevention includes wearing long, light-colored trousers tucked into boots when hiking, as well as observing personal protective measures effective against tick bites.
- TBE vaccines may be given in 2 or 3 doses, depending on the vaccine. Accelerated schedules are available.
- Vaccine side effects are most commonly injection-site reactions, fever, tiredness, and diarrhea.
- Duration of vaccine protection is 3 to 5 years; a booster dose is recommended if at continued risk.

Introduction

TBE, a viral infection that occurs in focal areas of Europe and Asia, is transmitted via the bite of an infected tick. Travelers going to affected countries with exposure in tick-infested areas are at risk of acquiring this potentially serious infection. No curative treatment is available after infection.

Risk Areas

TBE occurs in focal areas of Europe and Asia, extending from eastern and southern England 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, western Siberia, and Switzerland have the highest frequency of infection. Many central European countries, particularly Austria, Germany, Poland, and Switzerland have significant regions of infection, and incidence seems to be increasing in the Scandinavian countries. TBE-infected ticks infesting areas of wooded suburbs and peri-urban and urban parks have been reported in China, Europe, Finland, Russia, Scandinavia, and the Baltic states.

Ticks are most active in spring and summer, and TBE commonly occurs from April through November. 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).

Transmission

The TBE virus is mainly transmitted to humans through the bite of infected ticks that crawl onto humans in search of a blood meal. Although ticks may stay attached for several days, transmission can occur within seconds of being bitten. Rarely, the virus may also be transmitted by consuming unpasteurized milk or dairy products from infected farm animals, especially cows, goats, or sheep.

Risk Factors

Risk exists for travelers 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 appear about 8 days (range: 4-28 days) following exposure and include an influenza-like illness (fever, headache, muscle aches, and fatigue), which may either resolve completely in a few days or resolve temporarily and relapse as a more severe illness. TBE is more severe in persons 50 years and older.

Consequences of Infection

Consequences of infection include brain inflammation, nervous system complications, and muscle paralysis. Death occurs in about 2% to 40% of TBE cases, depending on the virus subtype (European, Far Eastern, and Siberian).

Need for Medical Assistance

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

Prevention

Nonvaccine

Observe personal protective measures effective against tick bites, including wearing long, light-colored trousers tucked into boots when in an area with risk for tick-borne diseases; light-colored clothing makes it easier to spot ticks. See ***Insect Precautions***.

Ticks that transmit TBE virus can bite throughout the day and night but have peak biting times during the day. Travelers should be especially vigilant in applying repellent during peak biting activity times. Treat outer clothing, boots, tents, and sleeping bags with permethrin (or other pyrethroid) when traveling in a high-risk area for TBE.

Campers should avoid sites close to animal habitation and, whenever possible, sleep in screened tents. Perform a full body check (especially the neck, scalp, groin, armpits, and navel) for adult ticks and nymphs during and after outdoor activity and at the end of each day when staying in an area with risk for tick-borne diseases. Remove attached ticks immediately, preferably with forceps or with fine-tipped tweezers to reduce the risk of infection.

Uncomplicated tick bites can be managed with simple measures, whereas tick-borne infectious diseases and tick paralysis can be serious complications requiring qualified medical attention. In northern Europe, travelers should determine whether local urban parks present a risk for tick-borne encephalitis, for which an effective vaccine is available.

Additionally, travelers should avoid unpasteurized dairy products, especially goat milk.

Vaccine

TBE vaccination may be recommended for travel to some countries. Travelers who cannot obtain TBE vaccine in their home country should arrange to receive the vaccine upon arrival at their destination, if possible. TBE vaccines are available in the US, Europe, and Australia.

For travel, TBE vaccination is ***recommended*** for:

- All expatriates and travelers with prolonged stays in highly affected countries, due to the likelihood of occasional travel to forested risk areas or exposure in the outskirts of urban areas.
- All travelers with either short or prolonged stays that include hiking, camping, or other outdoor activities in forested risk areas with more than minimal risk.
- Persons who consume unpasteurized dairy products (milk and cheese) from goats, cows, or sheep.

Side Effects

Side effects are usually mild to moderate and include injection-site reactions (pain, redness, and swelling), headache, fatigue, dizziness, nausea and vomiting, diarrhea, and muscle aches. Fever, which is common in very young children, occurs occasionally in older children and is infrequent in adults.

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

Timing

The primary series for the US vaccine consists of 3 doses, 1 each given at 0, 14 days to 3 months (1-3 months in children < 16 years), and 5-12 months after dose 2. If unable to complete the full 3-dose series before travel, 2 doses before departure will provide sufficient protection for healthy persons. However, the duration of protection following 2 doses is unknown, and a third dose is recommended if ongoing exposure or reexposure is expected. Further booster doses are recommended every 3 to 5 years if at continued risk.

Vaccines available in Europe may be administered on different schedules than the US vaccine and should be discussed with the provider if intending to receive either the complete vaccine series or finish the series in Europe.
