Tick-borne encephalitis

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What is tick-borne encephalitis?

Tick-borne encephalitis (TBE) is a viral encephalitis caused by a virus spread by ticks. Ticks are the main carriers of the virus. The virus is also found in small rodents (mouse, rat) and some larger animals such as deer, sheep and goats.

There are three different main types of TBE virus: the European (Western), the Siberian and the Far-Eastern (spring-and-summer encephalitis) type. The European type is mainly found in central, eastern and northern Europe. People get TBE mostly in spring, summer and early autumn.

How can you get tick-borne encephalitis?

People can be infected following a bite from an infected tick. Ticks are small parasites that survive by sucking blood from animals – including humans. Ticks live in forests, woods, grasslands, riverside meadows, marshes, brushwood and shrublands. They usually live in the undergrowth, where they can easily get onto the clothes or skin of passers-by. Therefore walkers, for example, are at an increased risk of getting the disease. The highest risk is for people when hiking or camping in forested areas up to an altitude of about 1500 m.

Not all ticks carry the virus, but it can be present in up to 10% of ticks in some areas.

Occasionally, people have been infected after drinking untreated milk from animals such as goats. There is no direct person-to-person transmission.

TBE virus is endemic in many parts of Europe (Estonia, Slovenia, Latvia, Lithuania, Czech Republic, Austria, Sweden, Switzerland, Slovakia, Hungary, Poland, Finland, Germany, France, Croatia and Norway), Siberia, Far-Eastern Russia, northern China and Japan. In the past years TBE virus has been detected for the first time in countries such as the Netherlands (2016) and UK (2019). It is predicted that the areas affected will grow due to global warming.

Symptoms of tick-borne encephalitis

Most people, who are infected with the TBE virus, show no symptoms at all. In those that do have symptoms (up to 30%), they typically appear about one-two weeks after the bite. From those with initial symptoms, one third will develop neurological symptoms.
In the European type of TBE there are normally two phases to the illness. The first phase consists of flu-like illness with symptoms such as fever, headache and generalised body aches. It lasts around five days. There is then about a week with no symptoms, which is followed by the second phase of the illness, when the brain or nerves are involved.

The severity of the second phase varies between patients. Some people have a very mild illness whilst others may have a severe illness. Older people tend to get a more severe illness than younger people or children. The symptoms in the second stage are similar to other causes of encephalitis and meningitis (inflammation of the lining of the brain). These include neck stiffness, headache, nausea, impaired consciousness (from drowsiness to coma), poor coordination, tremor, personality changes and psychosis. Some patients will also get muscle pain or limb weakness (most often in the arms). In severe cases the muscles that control the breathing are affected and people may die.

How is it diagnosed?

TBE can be diagnosed by a blood test and lumbar puncture (LP). LP (sometimes called a ‘spinal tap’) is a procedure which involves passing a needle, under local anaesthetic, between two of the backbones at the base of your spine to collect the cerebrospinal fluid (CSF) (fluid surrounding the brain and the spinal cord).

The virus can be detected in the blood in the first phase of the illness, whilst the antibodies (proteins produced by our own body to get rid of viruses and bacteria) can be found in blood and cerebrospinal fluid, usually, in the second phase.

Brain scans such as computed tomography (CT) and magnetic resonance imaging (MRI) can show abnormalities specific encephalitis, but do not have specific characteristics for TBE.

Treatment of tick-borne encephalitis

Unfortunately, there is no specific treatment for TBE. People who have severe disease may need supportive treatment in hospital such as intensive care. However, most people will only need symptomatic treatment.

Consequences of tick-borne encephalitis

Some people (less than 2%) may die from TBE. This is more common for the Far-Eastern type. Some people will recover completely. Still others may have long lasting problems such as paralysis (the inability to move your arms and/or legs), ataxia (difficulties with coordination, balance and speech), headache, tiredness, difficulty concentrating and poor memory. If children are affected, they may be left with cognitive problems (e.g. short-term memory problems), headache, fatigue and irritability.

Prevention of tick-borne encephalitis

TBE can be prevented by avoiding the areas where the disease occurs. However, this may not be possible all the time. If walking in affected wooded or rural areas, it is recommended to wear long trousers/sleeves to cover exposed skin, use an insect repellent that is effective against ticks, and inspect your skin for ticks regularly. The attached ticks need to be removed as soon as possible by using tweezers as close to the skin attachment as possible through steady pulling without jerking or twisting. Unpasteurised dairy products should also be avoided in these areas.

The best protection against TBE is given by the vaccine which is available mainly in countries from Western Europe. In some countries, (e.g. Austria) the vaccination was included in the national vaccination programmes and resulted in huge reduction of TBE cases. Internationally, there isn’t a consensus regarding the risk of TBE in travellers. However, according to the World Health Organisation, at risk-travellers (travellers exposed outdoors in rural endemic areas
between April to November) are advised to take up vaccination. More information on prevention/vaccination can be found on our website www.encephalitis.info/encephalitis-guidelines-for-travellers

Other sources of information:

Tick Alert (www.tickalert.org) aims to raise awareness about the risk of TBE which is endemic in 27 countries across Europe. The campaign encourages travellers planning to visit a TBE endemic country to find out more about the disease and take action by contacting their GP or travel health clinic to discuss precautions.

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Thank you!

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