TBE NEWS

ALIMENTARY AND OTHER NON-VECTORIAL TRANSMISSION OF TBE VIRUS

Background

The main route of transmission of TBE virus is by tick bites, but non-vectorial transmissions, e.g., by consumption of unpasteurized milk or milk products, are sometimes reported. Two review articles have recently been published about this phenomenon in which this route of transmission has systematically been analyzed.

Results

Elbaz et al. have analyzed articles published in English from January 1980 to June 2021 for food-borne TBE (FB-TBE). Ultimately, the authors included 19 studies meeting eligibility criteria, describing 410 patients across Europe – 384 with confirmed FB-TBE and 26 with probable FB-TBE. Countries reporting FB-TBE cases from 1980 to 2021 included Slovakia, the Czech Republic, Poland, Hungary, Estonia, Germany, Croatia, Austria, Russia, and Slovenia.

Most FB-TBE cases occurred during April to August (89%), and there was a wide patient age distribution, 1–85 years. Of the 120 patients for whom vaccination status was recorded, only one was vaccinated, but the last vaccination booster was more than 15 years ago, and thus the recommended booster interval was overrun. In 66% of the patients, raw milk or cheese from goat had been consumed; in 25% the milk was from sheep, in 7% from cows, and in 2% it was a mixture of unpasteurized dairy products. For 90% of the patients for whom incubation time was reported, this was less than two weeks. The median incubation period was 3.5 days. A biphasic disease was reported in 77% and invasive CNS disease was common.

Martello et al. had studied the literature from inception to April 2021 and limited the search to the 27 EU member countries, Iceland, Norway, Switzerland and the UK. The searches identified a total of 7,246 results, of which 158 were identified to be potentially eligible for full text screening. Of these, 41 studies were included. Most FB-TBE patients became infected in Slovakia, followed by the Czech Republic, Germany, Hungary, Croatia, Poland, Slovenia, Austria, Estonia, Finland, Italy, Lithuania, and Sweden.

Three studies were identified of non-vectorial transmission, in which the infection was via handling of infected material in a laboratory setting. However, these cases dated back to the 1970s to 1990s when the laboratory protective measures were unlikely to be as robust as current tools and methods. No transmission of TBE virus in laboratory settings were reported in the past two decades.

Two studies assessed vertical transmission as a potential mode of transmission of TBE virus. Such cases have recently been discussed in the TBE News, e.g., Snapshot week 40/2022, Snapshot week 28/2020.

One study assessed blood transfusion as the mode of transmission of TBE virus and reported single cases of TBE from 1959–1987 in Finland. Two cases of TBE underwent blood transfusions in hospital and TBE was confirmed in both patients; however, no information on the recovery was reported.

The other study assessed solid organ transplant as the mode of transmission of TBE virus in Poland (liver and kidney from a single infected donor to three recipients). The recipients became ill 17–49 days after transplantation and died a few days later in hospital.

Discussion

Most reported FB-TBE cases were documented in months that parallel tick season in Europe.

Although the transmission mode is different and the incubation period is shorter, FB-TBE has clinical manifestations like those for disease transmitted by ticks.

Despite alimentary transmission of TBE being uncommon, this transmission mode has the potential to cause outbreaks affecting many persons (more than 600 persons during an outbreak in Czechoslovakia in 1954), making FB-TBE a major public health concern. However, vaccination seems to be effective in preventing FB -TBE.

In general, customers should be informed that unpasteurized milk or its products may be contaminated with various pathogens including TBE virus.

Vaccination of milk producing animals in endemic areas could be considered as a further way to protect consumers from the risk of alimentary TBE virus infections.

You can listen to an interview with Meital Elbaz in a podcast stored on the Emerg Infect Dis home page.

Literature

Elbaz et al.
Systematic review and meta-analysis of foodborne tick-borne encephalitis, Europe, 1980-2021
Emerg Infect Dis. 2022;28(10):1945-1954. doi:10.3201/eid2810.220498

Martello et al.
Systematic review on the non-vectorial transmission of tick-borne encephalitis virus (TBEv) [published online ahead of print, 2022 Aug 11].
Ticks Tick Borne Dis. 2022;13(6):102028. doi:10.1016/j.ttbdis.2022.102028

Author: Dr. Michael Bröker

Compiled: October 2022