



## TBE VACCINATION PROTECTS AGAINST ALIMENTARY ROUTE OF INFECTION

### Background

The main route of TBE virus infection is by tick bites. However, alimentary transmission by non-pasteurized milk and milk products is known for many years (TBE is also termed “biphasic milk fever”) and is relatively often observed in eastern and southeastern European countries (see [Newsletter March 2019](#), [Snapshot week 33/2020](#)) and the Baltic States, but has recently also been described in western European countries like Austria, Germany, and France (see [Snapshot week 25/2020](#) and [Newsletter April 2018](#)). To avoid such alimentary infections, only pasteurized milk should be consumed (see [Snapshot week 27/2020](#) about the effectiveness of TBE virus inactivation by pasteurization). Generally, TBE is caused by the consumption of milk from goats and sheep, less frequently from cows. When an alimentary TBE virus infection occurs, there is often more than only one person affected and outbreaks with TBE in 10, 20 or even 50 individuals have been described.

### Results

In the beginning of May 2017, a TBE case has been reported in the Federal State of Baden-Wuerttemberg, Germany, in an area where no previous TBE case had been reported before. It was assumed that the cause of this infection may be related to the consumption of non-pasteurized goat milk, and therefore a retrospective investigation by the district health office was started to detect more possibly exposed patients. As a result, a total of 27 individuals who drank milk from a goat flock of a farm in that area were identified. From 20/27 exposed people, medical information was available for further analyses. 13/20 persons were infected as shown by the detection of TBE IgM (ELISA) and by a significant increase in IgG antibodies. All patients reported unspecific generalized flu-like symptoms including headache, muscle ache, neck stiffness etc., while

in 7/20 persons with no detected TBE infection and no detection of TBE IgM, no clinical symptoms were reported.

The medical TBE vaccination history of the exposed persons revealed that 6/20 exposed people were vaccinated against TBE, and of these persons only one had fallen ill who had been vaccinated 15 years ago with no booster injection since then. 14/20 persons were not vaccinated and 12 of these 14 individuals became ill, and TBE virus infection was serologically confirmed.

In *Ixodes ricinus* ticks flagged near the goat meadows, TBE virus could be detected, and phylogenetic analyses revealed that the virus was of European subtype closely related to strains in two neighboring areas. In one goat, TBE antibodies were found.

### Discussion

The data presented in this publication show that all completely vaccinated individuals were protected against TBE by alimentary infection. Only one individual, whose last TBE vaccination was 15 years ago, got ill and might not have been protected anymore due to a missing booster (at least 10 years overrun according to the German vaccination recommendations). Regular booster vaccinations should not be neglected. Clinical studies have shown that one booster injection is sufficient to significantly increase the antibody titers even after long overrun and as a result, vaccinees should (again) be protected against TBE after only vaccine injection when the booster had been forgotten for many years.

Although the absolute number of fully vaccinated and therefore protected individuals was low in this study, the results clearly indicate that TBE vaccination not only protects against TBE virus infection by tick bites, but also against TBE virus infection by the alimentary route. The risk to acquire TBE by the consumption of non-pasteurized milk and milk products is not well



known among consumers, and more educational advertising is warranted.

## Literature

Chitimia-Dobler et al.

Tick-borne encephalitis vaccination protects from alimentary TBE infection: results from an alimentary outbreak.

*Microorganisms*. 2021; 9:889. doi:103390/microorganisms9050889.

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