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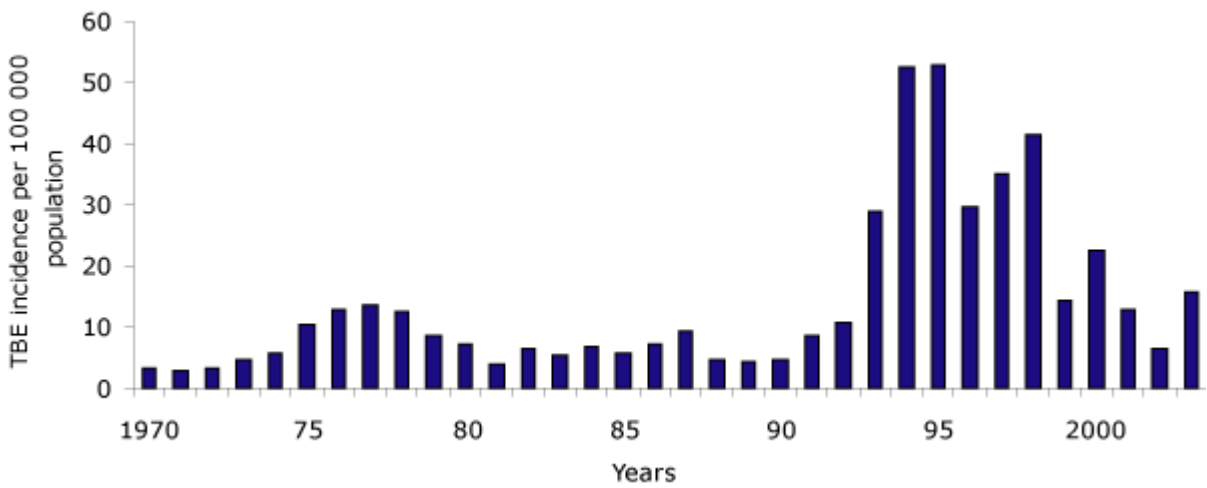
Tickborne encephalitis in Latvia

Irina Lucenko (lucenko@sva.lv), Ilze Jansone, Inga Velicko, and Elina Pujate, Valsts agentura “Sabiedribas veselibas agentura”, Riga, Latvia

Tickborne encephalitis (TBE) epidemiology and tick activity

TBE has been notifiable in Latvia since 1955. In 1993, annual incidence quadrupled from the mean level of the previous two decades (nearly 8 cases per 100 000 population), reaching the highest levels in 1994 and 1995 at 53 cases per 100 000. Since 1999 the incidence has been significantly lower, down to 6.5 cases in 2002, but back up to 15.7 per 100 000 in 2003 (Figure). About 60% of TBE cases over the last 10 years affected the meninges, about 30% were febrile and 10% had the most severe clinical course, meningoencephalitis.

Figure. TBE incidence in Latvia. 1970-2003 [Source: SE Randolph (personal communication, 2004) and International Working Group on TBE (http://www.tbe-info.com/epidemiology/index.html)]



There are two tick species in Latvia, *Ixodes ricinus* and *Ixodes persulcatus. I. ricinus* has two seasonal activity peaks in the western and central part of Latvia. *I. persulcatus* has only one spring activity peak and predominates in the eastern part of the country. According to monitoring data, the abundance of ticks has increased since 1994, with the highest peaks of *I. ricinus* tick activity recorded in 1998 and 2000, which does not match the epidemiological pattern exactly.

The highest TBE virus (TBEV) prevalence in field-collected ticks was observed in 1995 (28.4%), 1996 (10.8%) and 2002 (9.2%). Apart from these three years, over the whole observation period since 1973, the mean annual TBEV prevalence rate in field-collected ticks was about 3%.
Tests on ticks engorged with human blood, brought to the vaccination service by members of the public, started in 1998. The TBEV prevalence rate in these ticks was found to be much higher, about 30%.
Typing of TBEV isolated from ticks and patient serum samples in collaboration with German and Swedish virologists revealed that the viruses belong to *Far Eastern* and *Western* subtypes and are highly homologous with the *Vasilchenko*, *Neudoerfl* and *Sofyn* strains previously described [2,3,4].

Vaccination

Annual changes in TBE morbidity depend on factors other than tick activity, such as vaccination, awareness campaigns, changes in usual recreation due to weather, etc.

There is a significant correlation between marked decreases in TBE morbidity and increases in vaccination coverage. According to the incomplete data from vaccination services, which are mostly privately run and not obliged to submit statistical data, the number of completely vaccinated people since 1993 rose 3-5-fold. Vaccine uptake according to the recommended vaccination schedule improved during the last decade, when the number of second and third doses came nearer to the number of first doses. The number of booster doses also increased significantly. Each year, the demand for immunisation is usually highest during April, May and June, when tick activity first peaks and awareness of the problem is higher.

In 1994, a campaign to vaccinate children against TBE began in areas of high TBE risk in Latvia. There are 5 rural areas where child TBE incidence level exceeded the mean level in country (20 cases per 100 000 children); in areas with the highest TBE incidence, the levels exceeded the mean by more than six times. These became a vaccination priority and 75% of children in these rural districts are now covered.

Vaccination in the two highest risk groups of infected territories was completed in 1998. Altogether, children have been vaccinated in more than 100 rural districts. The childhood vaccination campaign was funded by humanitarian aid (51%) and national budget (49%), and this has brought the child TBE incidence in high risk areas down to a rate similar to the mean in the whole country since 1999.

However, according to predictions (which were calculated using the child TBE incidence rate over previous five years), the theoretical morbidity in high-risk rural districts could exceed the rate from notified data more than 5 times.

According to official statistics, the immunisation coverage for the whole population of Latvia is about 5%, but results of a population survey of TBE prophylaxis awareness (1000 respondents) suggested the percentage of vaccinated adults was higher: 15% people on low incomes and 26% of all respondents reported that they had been vaccinated.

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