DETECTION OF TBE VIRUS IN ENGLAND

Background

TBE and the TBE virus are well-known to occur in certain areas of France, which so far was the most westerly endemic TBE country in Europe, whereas in Asia, Japan is the most easterly TBE endemic country of the Eurasian continent. Recently, new TBE foci have been described in The Netherlands (see Newsletter November 2018) and in France (see Snapshot week 38/2019), but no TBE virus foci had so far been detected in Belgium and Luxemburg and westerly from Continental Europe, in the United Kingdom (UK). The only tick-borne flavivirus documented in the UK, is the louping ill virus (LIV), which is closely related to TBE virus and transmitted by Ixodes ricinus, the most abundant tick species in the UK. LIV mostly affects sheep, cattle and red grouse in England, Wales and Scotland, and humans are only incidental hosts. Public Health England has developed a surveillance program focusing on wild animals and ticks to analyze if TBE virus may be circulating in the UK.

Results

Literature 1

Persons involved in routine management of deer from across the UK were recruited to collect serum and ticks from any species of deer. Deerstalkers submitted a total of 1,323 serum samples from five deer species (mostly from roe deer *Capreolus capreolus*), which have been collected across Scotland and England.

A total of 4% of sera from England were positive using a commercial TBE IgG ELISA and 5% were positive for LIV antibodies using a hemagglutination (HAI) test. ELISA- and HAI-positive samples were geographically distributed to specific areas with a high prevalence in southwestern Norfolk and northwestern Suffolk (Thetford Forest). The latter had the highest seroprevalence by ELISA (51.3%). A total of 2,041 ticks collected from deer within 15 km of an ELISA-positive result were tested by LIV/TBE virus rRT-PCR and five ticks collected within the Norfolk/Suffolk area were tested positive. No LIV RNA was detected in these five ticks when they were specifically tested by rRT-PCR designed to detect only LIV. However, one tick showed high levels of TBE virus RNA and full-length genome sequencing revealed TBE virus of European subtype, most closely related to the Norwegian Mandal strain (TBE virus recently detected in Northern Zealand, Denmark, was also closely related to this strain, see Snapshot week 45/2019).

Literature 2

In addition to the study discussed above, Public Health England (PHE) Health Protection Research Unit has recently carried out surveillance of TBE virus in England from environmental dragging. In the New Forest (located in south-east England), one pool of five ticks out of 2000 were found to be positive for TBE virus and the strain was genetically similar to one previously seen in the Netherlands.

Discussion

For the first time, serologic evidence suggests a high prevalence of the TBE virus in certain areas of England and this was underlined by the detection of the TBE virus in *I. ricinus* ticks collected from deer in the TBE virus positive areas in England. The authors concluded that TBE virus is established and maintained through enzootic cycles within the Thetford area rather than resulting from multiple importation events. The close identity of the UK virus isolate with a virus strain from Norway (Mandal), suggests that the TBE virus may have been imported by migratory birds from TBE endemic regions in Norway. Although no autochthonous TBE case has yet been diagnosed in the UK (only imported cases,

e.g. see Snapshot week 47/2019), the TBE virus should henceforth be considered as a potential cause in encephalitis patients in the UK. The detection of the TBE virus at another place in England and the genomic relatedness of this isolate to a strain isolated in the Netherlands shows that there were at least two separate TBE virus introductions to England.

Literature

Literature 1

Holding et al.

Tick-borne encephalitis virus, United Kingdom

Emerg. Infect. Dis., in press, doi.org/10.3201/eid2601.191085

Literature 2

Joint Committee on Vaccination and Immunsation (JCVI)

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