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Cross-Sectional Study on the Prevalence and Factors Influencing Occurrence of Tick-Borne Encephalitis in Horses in Lithuania

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Abstract

Various animal species have been evaluated in depth for their potential as Tick-borne encephalitis virus (TBEV) sentinel species, although evidence for equine capacity is incomplete. Therefore, a comprehensive cross-sectional stratified serosurvey and PCR analysis of selected horses (*n* = 301) were performed in TBEV endemic localities in Lithuania. Attached and moving ticks (*n* = 241) have been collected from aforementioned hosts to evaluate natural infectivity of TBEV vectors (*Ixodes spp.*) in the recreational environments surrounding equestrian centers. All samples were screened for TBEV IgG and positive samples were confirmed by virus neutralization test (VNT). 113 (37.5%) horses from all counties of Lithuania tested positive for TBEV IgG, revealing age and sex indifferent results of equine seroprevalence that were significantly dependent on pedigree: horses of mixed breed were more susceptible to infection possibly due to their management practices. TBEV prevalence in equine species corresponded to TBEV-confirmed human cases in the precedent year. As much as 3.9% of horses were viraemic with TBEV-RNA with subsequent confirmation of TBEV European subtype. 4/38 of tested tick pools were positive for TBEV-RNA (Minimal infectious rate 1.2%). Several unknown microfoci were revealed during the study indicating areas of extreme risk close to popular human entertainment sites. The study provides important evidence in favor of horses' usage as sentinel species, as equines could provide more detailed epidemiological mapping of TBEV, as well as more efficient collection of ticks for surveillance studies. View Full-Text

Keywords: TBE; TBEV; tick-borne encephalitis; TBE seroprevalence

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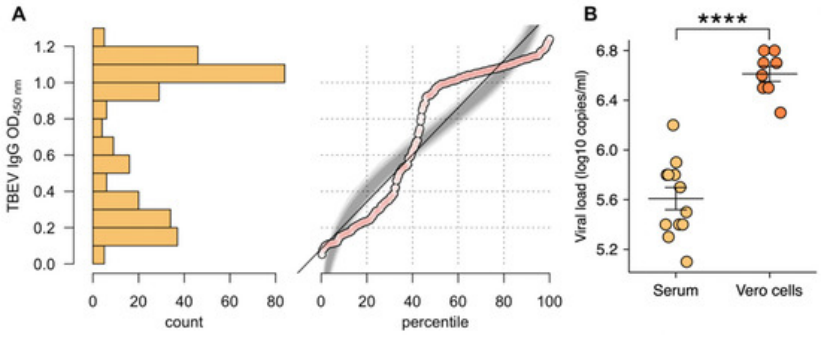

Figure 1

Supplementary Material

Supplementary File 1:
PDF-Document (PDF, 137 KiB)