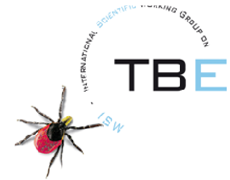

14th ISW-TBE Newsletter

October 2010

Dear colleague,

It is our pleasure to bring to you the 14th edition of the international ISW-TBE Newsletter, covering the latest news and activities in the field of TBE.

This edition includes the following reports:

1) **TBE in Infants—Rare, but Real: A German Case Report**
2) **Croatia 2010: Series of Tick Bites Provokes Health Scare**
3) **Conference News: ICLB 2010 in Ljubljana, Slovenia**
4) **TBE in the USA**

We hope you find this issue enjoyable.

Best regards,

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Leistner and Dahlmen from the Pediatrics Department of Coburg Medical Center report the first case of TBE in infancy in Germany [1].

Case presentation

In October 2006, a previously healthy 4.5-month-old baby boy presented with sudden-onset fever and generalized seizures. The clinical and neurological examinations were normal, but the following laboratory parameters were slightly to moderately elevated:

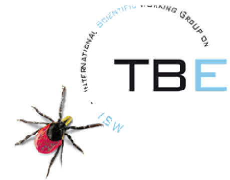
Leukocytes	20 600 cells/mcl
C-reactive protein	2.6 mg/dl
Glutamic oxaloacetic transaminase	185 U/l
Glutamate pyruvate transaminase	295 U/l
Gamma-glutamyl transpeptidase	63 U/l

Cerebrospinal fluid (CSF) examination revealed pleocytosis of 1100/3 cells (70% lymphocytes) and elevated protein (58.8 mg/dl). The patient's meningoencephalitis was treated with intravenous empiric antibiotics (acyclovir and cefotaxim) for 8 days. On questioning, the parents remembered a tick bite 11 days before admission. The family lives in an area highly endemic for TBE. The baby had not yet been in contact with grass or other plants, but his father worked in the woods regularly and may have transmitted the tick to his son. Diagnostic tests detected TBE virus RNA and specific IgM antibodies in serum and CSF. The infant's condition improved rapidly, and no neurological complications occurred during hospitalization. At the 12-month follow-up, the child was in good health, and neurological or other pathological findings were absent.

Discussion

Overall, this is the 4th case of TBE in infancy reported in the literature [2, 3, 4]. The ages of the 3 previous cases were 17 days, 6 weeks, and 3 months. All 4 babies had several features in common:

- They presented with acute onset, with a short history of fever and seizures
- Diagnostic tests showed lymphocytosis and specific IgM antibodies
- None of the infants experienced the typical flu-like first phase of TBE
- All infants had a severe course with meningoencephalitis requiring hospitalization



Only 3 of the 4 children had an unimpaired neurological outcome [1–3]. The 17-day-old infant suffered brain damage and clinically relevant long-term neurological sequelae, i.e., intractable focal seizures, right-sided flaccid hemiparesis, and marked developmental delay [4].

Authors' recommendations

- Because a causal treatment for TBE is not available, children should wear clothing protecting them from tick exposure, such as long sleeves and trousers. Using repellents and searching the clothes and skin of both the infant and the infant's closest contacts for ticks are additional important measures.
- Women of childbearing age should undergo TBE immunization, because protective IgG antibodies are transmitted via the placenta [5].

References:

[1] Leistner, C and P Dahlem *Fruhsommer-Meningoenzephalitis bei einem 4,5 Monate alten Saugling.* Klin Padiatr.

[2] Grubbauer, HM, HJ Dornbusch, et al. (1992). *Tick-borne encephalitis in a 3-month-old child.* Eur J Pediatr 151(10): 743-4.

[3] Iff, T, R Meier, et al. (2005). *Tick-borne meningo-encephalitis in a 6-week-old infant.* Eur J Pediatr 164(12): 787-8.

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[5] Eder, G and H Kollaritsch (2003). *Antigen dependent adverse reactions and seroconversion of a tick-borne encephalitis vaccine in children.* Vaccine **21**(25-26): 3575-83.

th Scare

According to ProMED-mail [1], a program of the International Society for Infectious Diseases, a series of tick bites provoked a health scare in Croatia in the summer of 2010. A total of 6 people were in a serious condition in a Croatian clinic after being infected through tick bites, Croatian media reported. 5 of the 6 patients were in a coma.

According to one of the attending physicians, doctor Bruno Barsic, 5 patients were connected to artificial respirators, and their recovery was uncertain. The sixth patient was in better condition and his life was not in danger. The patients, aged between 30 and 70, were from northern Croatia and were bitten by ticks carrying the tick-borne encephalitis virus. By July 2010, a total of 11 people from rural areas in Croatia had been hospitalized for tick bites, but this series of cases was more serious; more detailed information on these cases has so far not become available.

In Croatia, the only natural focus of TBE is in the northern part of the country, between the rivers Sava and Drava. Between 1998 and 2007, the annual number of cases ranged from 12 to 38. In the five-year period between 2003 and 2007, a mean of 27 cases were reported annually [2].

United Nations Cartographic Section, public domain.

References:

[1] www.promedmail.org

[2] J Süss. TICK-BORNE ENCEPHALITIS IN EUROPE AND BEYOND – THE EPIDEMIOLOGICAL SITUATION AS OF 2007. Eurosurveillance 13;26. www.eurosurveillance.org/ViewArticle.aspx?ArticleId=18916

12th International Conference on

LYME BORRELIOSIS AND OTHER TICK-BORNE DISEASES

From 26–29 September 2010, the 12th International Conference on Lyme Borreliosis and other Tick-Borne Diseases (ICLB) took place in Ljubljana, Slovenia. Elinor R. Godfrey and Sarah Randolph from the Department of Zoology, University of Oxford, UK, presented results of research made possible by the rather unfortunate turns of recent events—the economic crisis.

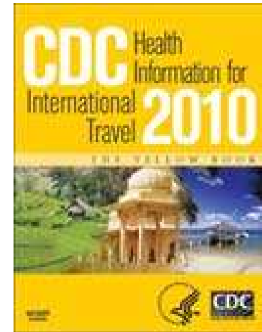
It had been shown previously that the incidence of zoonoses is due as much to changes in human behavior as to changes in natural wildlife cycles. Godfrey and Randolph tested the hypothesis that adverse economic and social conditions would lead to changes in human behavior, in turn resulting in an increase in TBE cases. Multiple regression analysis was used to examine the predictive power of unemployment in 2009 and various socio-economic indices for the change in TBE case numbers in 2009 relative to 2004–2008 for 14 European countries.

Poland, Latvia, and Lithuania showed an increase in TBE cases in 2009, exceeding both the standard deviation of the mean number of cases in 2004–2008 and the number of cases in 2008. These countries also experienced a substantial increase in unemployment in 2009.

Variables linking dire economic conditions with TBE incidence include a reduced ability to afford vaccinations and activities bringing people into closer contact with infected ticks, such as berry and mushroom picking. By selling these and other forest foods at local markets, people can improve their economic situation in times of economic downturn.

Identifying risk factors for TBE infection allows effective education programs to be developed and vaccination to be targeted at those who are economically most vulnerable.

CDC Yellow Book on Traveler's Health—2010 Edition



For an unvaccinated visitor to an endemic reagion during the tick season, the overall risk of acquiring TBE has been estimated at 1 case per 10,000 person-months of exposure. The ISW-TBE has long been working to raise awareness of the potential danger TBE poses to international travelers from non-endemic areas. Seeing a comprehensive summary of TBE included in the latest version of the CDC Health Information for International Travel 2010 [1] is therefore quite a treat.

The CDC Traveler's Health Yellow Book has been extensively revised in an effort to stay on the cutting edge of travel health information. The book is meant to be a guide to the practice of travel medicine as well as the authoritative source of US government recommendations for immunizations and prophylaxis for foreign travel.

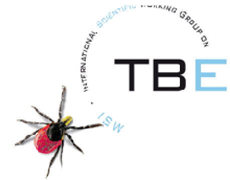
The authors go from briefly characterizing the infectious agent to how it is transmitted, where TBE occurs, and how it is diagnosed. They also provide an overview of personal protective measures and introduce available vaccines, including detailed vaccination schedules [2].

Tick-borne Encephalitis among US Travelers to Europe and Asia: 2000–2009

In a recent publication in the CDC Morbidity & Mortality Weekly Report (MMWR), Granger et al. [1] summarize the 5 cases of TBE among US travelers identified during a recent review of the years 2000–2009 performed by the CDC. Before 2000, two cases of TBE in North American travelers to Europe had been reported [3, 4].

Clinicians send specimens from patients with unexplained encephalitis to CDC as part of routine surveillance and diagnostic testing. All 5 cases had TBE virus (TBEV) or Powassian virus (POWV) immunoglobulin M (IgM) antibodies in serum and were confirmed as acute TBE cases by plaque-reduction neutralization tests against both viruses. All 4 patients who had traveled to Europe or Russia had biphasic illnesses and made near-complete recoveries. The fifth patient—the first reported case of TBE in a US traveler to China—had a monophasic illness with severe encephalitis and neurologic sequelae.

Case 1. In 2001, a previously healthy 57-year-old man was admitted to a Utah hospital with fever, tachycardia, mental status changes, tremors, and right-sided rigidity. One month previously, he had traveled to eastern Russia where he noted having multiple tick bites. The patient was diagnosed with encephalitis of unknown etiology and treated empirically with antibiotics and corticosteroids, with resolution of fever and recovery of normal mental status. He returned home after 14 days, and his motor symptoms resolved during the next 6 months;



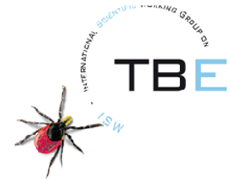
however, he continued to experience mild cognitive impairment. Serum collected on admission tested positive for TBEV IgM and TBEV-specific neutralizing antibodies. Serologic tests for other arboviruses and pathogens were negative.

Case 2. In 2004, a previously healthy 20-year-old man was admitted to a Wyoming hospital with fever, photophobia, and altered mental status. He had traveled in Siberia, Russia, and noted having multiple tick bites. The patient was diagnosed with encephalitis of unknown etiology and treated empirically with antibiotics. He was hospitalized for 4 days and recovered fully. Serum collected on admission tested negative for TBEV IgM but positive for POWV IgM and TBEV-specific neutralizing antibodies. Serologic tests for other arboviruses and *Borrelia burgdorferi* were negative.

Case 3. In 2006, a previously healthy 46-year-old man was admitted to a hospital in Connecticut with fever and headache. He had traveled in Sweden and noted having numerous tick bites. About 3.5 weeks before admission, he developed fever and diarrhea requiring a brief hospitalization. His symptoms resolved, but 2 weeks before admission, after returning to the United States, he developed headaches and fever, which subsequently worsened. He was diagnosed with meningitis of unknown etiology, was hospitalized for 3 days, and recovered fully. Serum collected on admission tested positive for POWV IgM, TBEV IgM, and TBEV-specific neutralizing antibodies.

Case 4. In 2007, a previously healthy girl aged 15 years with acute encephalitis of unknown etiology was airlifted from a hospital in Beijing, China, and admitted to a hospital in New York City. On admission to the New York City hospital, her physical examination showed aphasia, hemiplegia, and hyperreflexia. A specimen of CSF showed pleocytosis, and MRI revealed bilateral thalamic and basal ganglia lesions. After a prolonged hospitalization and rehabilitation, she fully recovered cognitive function but had residual severe dysarthria and mild bradykinesia in the limbs. Serum tested negative for TBEV IgM but positive for POWV IgM and TBEV-specific neutralizing antibodies. Serologic tests for other arboviruses were negative.

Case 5. In 2008, a previously healthy boy aged 14 years was admitted to a hospital in the District of Columbia with fever, headache, and vomiting. He had traveled in the Czech Republic and Siberia, Russia, and noted having multiple tick bites. Three days before admission, he developed fever and headache, prompting his return home. He was diagnosed with meningitis of unknown etiology; treatment included empiric antibiotics and acyclovir. He fully recovered after an 8-day hospitalization. A convalescent serum sample tested positive for POWV IgM, TBEV IgM, and TBEV neutralizing antibodies. Serologic tests for other arboviruses and pathogens were negative.



Discussion

TBE is not a notifiable disease in the United States. Although testing for TBEV is available in certain specialized laboratories outside CDC, these 5 cases are the only TBE cases known to have been diagnosed in the United States during 2000–2009.

Authors’ recommendations

- Health-care providers should be aware of TBE, should counsel travelers about measures to reduce exposure to tick bites, and should consider the diagnosis of TBE in travelers returning from TBE-endemic countries with meningitis or encephalitis.
- Encephalitis or meningitis caused by TBE and other viruses cannot reliably be distinguished clinically. TBEV testing can be performed at CDC's Special Pathogens Branch (telephone: 404-639-1115), and TBEV and other arboviral disease testing can be performed at CDC's Arboviral Diseases Branch (telephone: 970-221-6400).

References:

[1] wwwnc.cdc.gov/travel/content/yellowbook/home-2010.aspx
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[3] Artsob H, Spence L. Imported arbovirus infections in Canada 1974–89. Can J Infect Dis 1991;2:95–100.
[4] Cruse RP, Rothner AD, Erenberg G, Calisher CH. Central European tick-borne encephalitis: an Ohio case with a history of foreign travel. Am J Dis Child 1979;133:1070–1.

This newsletter is intended to highlight interesting aspects and issues related to tick-borne encephalitis (TBE). It does not claim to be comprehensive or to provide medical advice. Should you have any questions on issues reported herein, please contact Professor Ursula Kunze at ursula.kunze@meduniwien.ac.at.

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