Mosquito bites and eastern equine encephalitis

Last summer, a 39-year-old man from the southeastern USA with no significant past medical history presented with high fever (104.5°F, 40.3°C), headache and photophobia with alteration of consciousness which required mechanical ventilation. His social history was significant for employment as a veterinary technician with exposure to different animals, including birds, dogs, cats, horses and cows. Cerebrospinal fluid (CSF) analysis showed high opening pressure of 38 cmH2O, normal glucose, increased protein level of 95 mg/dl (normal, 15–45 mg/dl), and significant pleocytosis of a total WBC of 975 cells/mm³ (normal, 0–5 mg/dl) with 90% neutrophils. CSF fluid Gram stain and cultures were negative. His MRI brain imaging studies showed hyperintense signals involving bilateral basal ganglia (horizontal arrows in Figure 1A), thalami (diagonal arrows in Figure 1A) and the brain stem (circle in Figure 1B) in T2-weighted FLAIR sequence. Based on the epidemiology and occupational history, combined with abnormal MRI findings, an arboviral infection was suspected. His CSF eastern equine encephalitis (EEE) virus-specific antibody was strongly positive with IgM 1:128 (normal, <1:4) and IgG 1:8 (normal, <1:4), confirming the diagnosis of neuroinvasive disease of EEE. He was treated with aggressive supportive care as there is no proven antiviral therapy for EEE. He regained consciousness after 2 weeks of coma, but remained in a persistent vegetative state. He was discharged to nursing home care with tracheostomy and gastrostomy feeding tube.

EEE is caused by EEE virus which is a member of North American encephalitic arbovirus, transmitted...
to humans by mosquito bites (Culex, Coquillettidia and Aedes species) during summertime along the Atlantic and Gulf coasts of the USA. EEE virus causes severe neuroinvasive disease in horses and humans, resulting in high mortality (up to 75%) as well as devastating neurologic sequelae among survivors. Diagnosis is usually confirmed by detection of virus-specific antibody in CSF or serum. Since there are broad differentials of encephalitis, this case highlights the importance for clinicians to recognize the characteristic neuroradiographic features of EEE. These MRI brain findings are observed in a limited number of other encephalitides such as measles encephalitis, mumps encephalitis, West Nile virus encephalitis, Japanese encephalitis and Creutzfeldt–Jakob disease. Recognition of these distinctive symmetrical MRI patterns, together with appropriate epidemiologic, travel, seasonal, occupational and immunization histories, would enable providing physicians to narrow the broad differentials and achieve the correct diagnosis.

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References