

Maine woman dies from deer tick virus

Monday, June 07, 2021

<https://danielcameronmd.com/case-report-fatal-powassan-virus-infection-k-deer-tick-virus/>

This case report describes an elderly woman from Maine, who was diagnosed post-mortem with a rare deer tick virus, known as the Powassan virus. The 72-year-old woman was admitted to the hospital with myalgias, chills, and an erythema migrans rash on her left scapula. She reportedly had 2 tick bites over the course of one month.

She was prescribed 14 days of doxycycline and discharged home.

The following day, she returned to the hospital, acutely ill with fever, arthralgias, and headache. Intravenous ceftriaxone was added to her treatment regime. But her condition continued to deteriorate.

Within 24 hours of admission, she developed hemodynamic instability, visual hallucinations, and confusion.

“By hospital day 4 she was obtunded and hypotensive. On day 5 she was intubated,” [writes Cavanaugh et al.](#) [1]

The patient's antibiotics were changed to Vancomycin, piperacillin-tazobactam, doxycycline, and acyclovir followed by vancomycin and meropenem.

“She was thrombocytopenic (platelets 21 000) and had developed oliguric acute kidney injury,” according to Cavanaugh.

Unfortunately, the woman died 10 days after entering the hospital.

Post-mortem diagnosis: deer tick virus

She was diagnosed post-mortem with the deer tick virus using acute and convalescent serologic testing with plaque-reduction neutralization test (PRNT) for confirmation. Serologic tests also revealed positive IgG serologic test for Anaplasmosis.

Her limited autopsy revealed “severe loss of anterior horn cells in the spinal cord and a diffuse meningoencephalitis of the brain,” writes Cavanaugh.

“The temporal lobes, hippocampus, putamen, brainstem, and cerebellum were most prominently involved. Cerebellar histology showed a severe loss of Purkinje cells.”

No treatment, vaccine in development

There is currently no treatment for the deer tick virus (Powassan virus). However, an April 2021 article

reports that a vaccine is in development.

"We anticipate that the POW-VLP vaccine will induce broad-spectrum neutralizing antibodies against EDIII within the natural virion structure and thus afford protection against Powassan neuroinvasive infection," [writes Cimica et al.](#) [2]

Types of Powassan virus

Powassan virus (POWV) lineage 1 and lineage II (DTV) each have their own enzootic cycles and primary tick vectors. POWV lineage 1 is predominantly maintained in an enzootic cycle between the tick vector *Ixodes cookei* and groundhogs, explains Cavanaugh.

This type of infection in humans, he says, is rare and "likely due in part to limited human contact with *I. cookei*, which is highly host-specific and lives in the nest or burrow of medium-sized mammals." The *I. cookei* tick rarely bites humans.

The second variant is POWV lineage II, a.k.a., deer tick virus. This subtype can be found in the same *Ixodes scapularis* tick and white-footed mouse that carry the spirochete that causes Lyme disease.

UPDATED: June 7, 2021

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References:

1. Cavanaugh CE, Muscat PL, Telford SR, 3rd, et al. Fatal Deer Tick Virus Infection in Maine. Clin Infect Dis. 2017;65(6):1043-1046.
2. Cimica, V.; Saleem, S.; Matuczinski, E.; Adams-Fish, D.; McMahon, C.; Rashid, S.; Stedman, T.T. A Virus-Like Particle-Based Vaccine Candidate against the Tick-Borne Powassan Virus Induces Neutralizing Antibodies in a Mouse Model. Pathogens 2021, 10, 680. <https://doi.org/10.3390/pathogens10060680>

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