Uveitis Associated With West Nile Virus Infection

In a recent case report, vitritis and chorioretinitis were described in a patient with presumed West Nile virus infection. We describe herein a patient in an outpatient neuro-ophthalmology clinic with iritis and vitritis and a confirmed acute West Nile virus infection. The 56-year-old woman developed blurry vision, floaters, malaise, and myalgias within a few weeks of mosquito exposure. Examination revealed bilateral nongranulomatous anterior uveitis and vitritis. Serological tests for West Nile virus revealed markedly elevated IgM and slightly elevated IgG. Plaque reduction neutralization testing by the Centers for Disease Control and Prevention (Fort Collins, Colo) confirmed West Nile virus infection. St Louis encephalitis virus test results were negative. Our findings demonstrate that nongranulomatous anterior uveitis and vitritis can occur in the setting of confirmed acute West Nile virus infection.

West Nile virus was first identified in a Ugandan patient in 1937. However, the first reports of the virus in the Western hemisphere did not surface until a meningoencephalitis outbreak in the New York City metropolitan area in 1999. The virus has continued to spread, and the large outbreak in the midwestern United States in 2002 resembled the outbreak of St Louis encephalitis in 1975. Although most patients infected with West Nile virus remain asymptomatic or develop only minor symptoms, potentially fatal meningitis or encephalitis occurs in approximately 1 in 150 infected persons.

The ophthalmologic characteristics consist of eye pain, photophobia, conjunctival hyperemia, and papilledema. Recently, a case report documented vitritis and chorioretinitis in a patient with possible West Nile virus infection. We describe herein a woman with nongranulomatous uveitis and concomitant acute West Nile virus infection, confirmed by plaque reduction neutralization testing.

Report of a Case. A 56-year-old woman with a medical history significant for hypertension, coronary artery disease, Graves disease, type 1 diabetes mellitus, hepatic and pancreatic insufficiency, seizure disorder, and mitochondrial myopathy complained of blurry vision in both eyes and black spots in the lower field of her left eye for 4 days. She denied flashing lights, eye or neck pain, fever, chills, or new neurologic deficit. Several mosquitoes had bitten her in the previous 3 weeks. She admitted to nausea, extreme malaise, muscle weakness, and soreness.

On examination, she was alert, calm, oriented, and cooperative. Her uncorrected visual acuities were 20/25 OD and 20/30 OS. Intraocular pressure was 17 mm Hg in each eye. Pupils were round, equal, and reactive, without relative afferent pupillary defect. Findings on slitlamp examination were unremarkable except for mild cataracts. Dilated fundus examination revealed bilateral mild nonproliferative diabetic retinopathy and no evidence of chorioretinal infiltrates. Her automated visual fields were normal in the right eye, with a new inferior arcuate in the left eye from previous perimetry. Her neurologic examination results were unremarkable.

She returned to the emergency department 5 days later with progressive blurring of vision in both eyes and black spots also now in the right eye. Magnetic resonance imaging of the brain yielded normal findings. Visual acuities were 20/25 OD and 20/40 OS. Her intraocular pressure was elevated to 23 mm Hg in the right eye and 32 mm Hg in the left eye. Slitlamp examination and dilated fundus examination demonstrated trace conjunctival hyperemia, bilateral nongranulomatous keratic precipitates, and moderate anterior chamber and anterior vitreous inflammation. Laboratory investigations showed normal results on complete blood count, chemistry panel (including blood glucose), thyroid function test, Westernblen sedimentation rate, C-reactive protein, and Cryptococcus antigen test. West Nile virus serologies were positive by enzyme-linked immunosorbent assay with an IgG result of 1.3 (normal, <2.00), and an IgM result of 6.38 (normal, <2.00). Plaque reduction neutralization testing (performed at the Centers for Disease Control and Prevention) confirmed a positive infection with West Nile virus and excluded an infection with St Louis encephalitis virus. She was treated with 1% prednisolone acetate in each eye on an hourly basis for a week. One week later, her vision had improved to baseline. The keratic precipitates were gone, and the inflammation had improved. Her systemic symptoms and the uveitis improved during the next 3 weeks. The patient refused to have a lumbar puncture.

Comment. West Nile virus is a single-stranded RNA virus that belongs to the Japanese encephalitis serogroup of flaviviruses, including St Louis, Kunjin, and Murray Valley encephalitis. Identification of IgM in serum or cerebrospinal fluid by IgM antibody–capture enzyme-linked immunosorbent assay suggests a preliminary diagnosis of infection in humans. However, because of cross-reactions between antibodies to West Nile and St Louis encephalitis viruses in this assay, results must be confirmed by plaque reduction neutralization testing, a virus-specific assay. Our patient had virus-specific IgM and IgG antibody responses to West Nile virus demonstrated by IgM antibody–capture enzyme-linked immunosorbent assay and confirmed by plaque reduction neutralization testing.

Recently, the finding of vitritis and chorioretinitis in a patient with positive IgM antibody to West Nile and St Louis encephalitis viruses was reported. These authors did not present evidence of convalescence tilters or plaque reduction neutralization testing confirmation of West Nile virus infection to definitively prove the diagnosis and thus acknowledged that their case was presumptive. Their patient could conceivably have been infected with St Louis encephalitis virus, with symptoms mimicking West Nile virus infection. Nevertheless, their case report suggests that flaviviruses in general may cause uveitis.
The incubation period of West Nile virus ranges from 3 to 14 days. Two serosurveys have shown that approximately 1 in 150 infections resulted in meningitis or encephalitis, but most human infections remain subclinical. The reported symptoms and signs associated with West Nile virus infection include fever, malaise, anorexia, nausea, vomiting, headache, myalgia, rash, and lymphadenopathy. The frequency of various symptoms and signs are poorly defined. Many patients with West Nile virus infection complain of severe muscle weakness. Acute flaccid paralysis similar to that associated with Guillain-Barré and poliomyelitis-like syndromes has been reported. Although our patient had a long history of mitochondrial myopathy, an acute change in muscle pain and fatigue had occurred. This would not be typical for a mitochondrial cytopathy, which is characterized by slowly progressive myogenic weakness.

Nash and colleagues described the clinical characteristics of 59 patients hospitalized with West Nile virus infection in the New York City area in 1999. Fourteen percent of patients had symptoms of photophobia, and 3% of patients had conjunctivitis. Marberg et al described 70 patients with West Nile fever. Forty-five percent reported ocular pain, and 60% had conjunctival hyperemia. Neither study commented on visual acuity or ophthalmologic examination findings. Although uveitis may have been the cause of the ocular findings, it was not specifically identified as such. Meningitis alone can cause photophobia and ocular pain. An Israeli patient developed signs and symptoms of meningitis, blurred vision, photophobia, and ocular pain. Ophthalmologic examination revealed visual dysfunction, bilateral optic nerve edema, and hemorrhages, but no uveitis. It is conceivable that the visual field defect in our patient was representative of a subclinical optic neuropathy secondary to the virus infection.

We postulate that some of the patients with photophobia, conjunctival hyperemia, and ocular pain may have had uveitis, but they were not examined by an ophthalmologist or with appropriate magnification. The patient described herein had anterior and posterior uveitis. Although acute hyperglycemia may cause uveitis, our patient had normal blood glucose levels throughout the observation period. Theoretically, our patient’s uveitis could have occurred via human T-lymphotropic virus type 1 infection in the setting of Graves disease. This is unlikely to occur at the same time as her acute West Nile virus infection; furthermore, she does not live in an endemic region for human T-lymphotropic virus type 1 or have any risk factors for the infection. Although idiopathic bilateral uveitis can occur, the temporal relationship to the acute West Nile virus infection in our patient suggests a relationship to the viral infection. In addition, some flaviviruses can cause uveitis. Advanced age is the most significant risk factor for the development of severe neurologic disease, long-term morbidity, and death associated with these viruses. Diabetes mellitus is also associated with death in this infectious setting. A similar finding was noted during the 1996 Romanian outbreak of West Nile encephalitis. Our patient’s medical conditions, including the presence of diabetes mellitus, may have predisposed the development of symptomatic West Nile virus infection, including uveitis.

Based on a MEDLINE search, we believe this represents the first report of uveitis associated with confirmed West Nile virus infection. Patients with a confirmed infection and ocular symptoms may warrant an ophthalmologic opinion. Patients with uveitis in endemic areas and with systemic symptoms may deserve West Nile virus testing.

Rachel W. Kuchey, MD, PhD
Gregory S. Kosmorsky, DO
Denise Martin, BS
Michael S. Lee, MD
Fort Collins, Colo

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Corresponding author: Michael S. Lee, MD, Cole Eye Institute, The Cleveland Clinic Foundation, 9500 Euclid Ave, Desk I-32, Cleveland, OH 44195 (e-mail: leem@ccf.org).

Exudative Complications After Photodynamic Therapy

Subfoveal choroidal neovascularization (CNV) caused by age-related macular degeneration is the leading cause of irreversible vision loss in Americans 65 years or older. Photodynamic therapy (PDT) with verteporfin (Visudyne; CIBA Vision Corp, Duluth, Ga) has been shown to retard vision loss compared with placebo in eyes with predominantly classic and purely occult CNV lesions. Verteporfin generates reactive oxygen species when illuminated with light at a wavelength of 689 nm, which results in occlusion of choroidal new