



Mosquito-Borne Viral Retinitis

A Global Health Perspective

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Keywords

- Retinitis • Uveitis • Mosquito vector • Dengue • Chikungunya • Rift Valley Fever • West Nile Virus

Key points

- The prevalence and incidence of several mosquito-borne diseases have been increasing dramatically.
- Ocular complications from systemic arboviral infections are often severe.
- Without curative treatments or vaccines at this time, public health strategies play a crucial role in combating arboviral infections.

Arthropod-borne viruses or arboviruses are an important and growing cause of morbidity and mortality worldwide. Although initially discovered in tropical or subtropical areas, these diseases have acquired a greater global impact with their spread from traditional endemic areas facilitated by a number of factors, including globalization, urbanization, and climate change [1]. The summer of 1999 marked a milestone for arboviruses in the Americas, with the introduction of West Nile Virus (WNV) to New York, which has since become the most prevalent cause of arboviral disease in the United States [2]. Furthermore, other arboviral infections have emerged, with

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the most recent identification of Zika infection identified in the Americas in 2015 [3].

In addition to sharing similar means of transmission via mosquitoes, arboviral diseases tend to have protean systemic manifestations with considerable overlap, as well as a spectrum of severity from asymptomatic to life-threatening. In addition, they have also been found to have ocular involvement, including uveitis, retinitis, and other intraocular inflammation. Without curative treatments or vaccines at this time, public health strategies play a crucial role in fighting arboviral infection. With the exception of Zika, this article reviews the various mosquito-borne arboviruses, with special emphasis on their ocular manifestations, and discusses current strategies for treatment and prevention (Tables 1 and 2).

DENGUE FEVER

Dengue fever, like West Nile, is caused by a member of the Flaviviridae family. Transmission is by the *Aedes aegypti* mosquito in urban areas and *Aedes albopictus* in suburban and rural areas. It is the most common mosquito-borne viral disease in humans, with the World Health Organization estimating an approximate 450,000 cases annually. The disease is primarily found in tropical and subtropical regions, and has been found in more than 100 nations worldwide [1]. There are 4 antigenically distinct serotypes of the dengue virus and although infection with 1 strain confers lifelong immunity against that serotype, individuals are not protected against infections from other dengue serotypes [4]. Additionally, sequential infections increase the risk of more severe systemic and ocular disease.

Disease course

Dengue fever can range from a mild febrile illness, or progress to classic severe dengue fever, characterized by a high fever, myalgias, headache, and a petechial rash, which is related to thrombocytopenia. Symptoms typically resolve with the recovery of platelet counts [4]. A small number of these patients develop dengue hemorrhagic fever syndrome, characterized by increasing capillary permeability, hypotension, and circulatory failure [5].

Table 1
Distinguishing features of mosquito-borne viral retinitis

	West Nile Virus	Dengue fever	Rift Valley fever	Chikungunya fever
Incubation period (d)	3–14 [1]	3–10 [2]	3–6 [3]	3–5 [4]
Classic features	Multifocal chorioretinitis [5]	Focal chorioretinitis [6]	Macular or paramacular retinitis [7]	Anterior uveitis, retinitis [8]
Regions affected	Africa, Europe, North America, Asia, Australia, South America [9]	Tropics [10]	Sub-Saharan Africa [11]	Africa, Asia, North America, South America [12]

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