



Case Report Retina

Unusual ophthalmic manifestation in a suspected case of dengue fever

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ABSTRACT

Dengue fever is a mosquito-borne flavivirus infection, and its clinical presentation varies from febrile illness and hemorrhagic manifestations such as petechiae and mucosal bleeding to life-threatening complications such as dengue shock syndrome. Ocular findings in dengue fever have a wide spectrum of manifestations ranging from mild non-specific symptoms to severe retinal hemorrhages. The purpose of this report is to describe a case of retinal involvement in a 65-year-old patient with classic features of dengue fever.

Keywords: Measles, Eruption, Conjunctivitis, Keratitis

INTRODUCTION

Dengue fever is a mosquito-borne flavivirus infection [four serotypes, namely Dengue-1 (DEN-1), Dengue-2 (DEN-2), Dengue-3 (DEN-3), and Dengue-4 (DEN-4)] in humans transmitted by *Aedes aegypti* and *Aedes albopictus* mosquitoes.^[1-3] The infection is endemic in developing countries and mostly occurs in Southeast Asia, India, and the American tropics (Indian statistics and hospital statistics). Dengue fever is characterized by symptoms of high-grade fever accompanied by headache, myalgia, arthralgia, flushing, nausea, and vomiting that appear 3–14 days after a bite from the vector. The clinical presentation varies from febrile illness and hemorrhagic manifestations such as petechiae and mucosal bleeding to life-threatening complications such as dengue shock syndrome (DSS). Ophthalmic manifestations of dengue fever can be either unilateral or bilateral. The time of onset is anywhere between 2 days and 5 months from the start of fever. Ocular findings in dengue fever, considered rare previously, have a wide spectrum of manifestations ranging from mild non-specific symptoms to severe retinal hemorrhages. Ophthalmic manifestations include subconjunctival, vitreous, retinal hemorrhages, posterior uveitis, optic neuritis, and maculopathies.^[4,5] The purpose of this report is to describe a case of retinal involvement in a patient with classic features of dengue fever.

CASE REPORT

A 65-year-old female, a known hypertensive and case of osteoarthritis, developed fever with headache during a season of the outbreak of dengue. She was investigated for dengue fever. Her investigations revealed a reduced platelet count with decreasing trend and NS 1 Antigen (NS1 Ag) was positive. She was managed conservatively with antipyretics and was given one unit of blood

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for reduced platelet count. The patient, who was an active personality engaging in activities such as embroidery, suddenly developed a sudden onset of profound loss of vision in both eyes (Perception of Light). It progressed rapidly to a state of unambulatory vision that caused her significant distress. Her symptoms were not associated with redness, pain, flashes, or floaters. On presentation, her visual acuity was perception of light with accurate projection of rays in both eyes. Keratic precipitates were present on the back of the cornea with anterior chamber activity of 3+ with iris pigments over anterior capsule. She also had an immature cataract with posterior sub-capsular opacification in both eyes. On fundus examination, the media was hazy. Optic disc hyperemia was present, with multiple yellow patches surrounding the optic disc and over the macula. In addition, multiple flame-shaped hemorrhages and macular edema were present in both eyes [Figure 1].

Fundus pictures of the patient show bilateral optic disc hyperemia with macular edema and multiple yellowish patches surrounding the optic disc.

Investigations such as complete blood count, renal function tests, liver function tests, and chest X-ray were within normal limits. Viral markers for human immunodeficiency virus, hepatitis B surface antigen, hepatitis C virus, and chikungunya fever were negative. Her erythrocyte sedimentation rate was raised at 80 mm for the 1st h. Based on her clinical picture, she was started on oral valacyclovir 2 g 2 times a day, oral prednisolone 60 mg once a day with topical prednisolone 1% four hourly, and oral doxycycline 200 mg 2 times a day. She was reviewed on a weekly basis. Patient's condition gradually improved from perception of light to finger counting at 3 m and on fundus examination, media was clearing and there was gradual disappearance of the retinal lesions. Oral prednisolone 60 mg was given for 2 weeks and tapered thereafter in view of the patient's improving condition. Oral valacyclovir and oral doxycycline were given for 2 weeks. At the end of 4 weeks, the patient visual acuity improved to 6/18 in her right eye and 6/24 in her right eye. Fundus examination revealed clear media with a normal background retina. The retinal lesions had completely disappeared. Her

decreased visual acuity can be attributed to the immature cataract with posterior subcapsular opacification.

DISCUSSION

Dengue fever, a viral epidemic, imposes a large healthcare burden in endemic regions and is of increasing international concern as a result of growing urbanization, tourism, and trade. There are an estimated 50 million dengue infections and 500,000 dengue-related hospitalizations annually, the majority from endemic regions such as the Americas, Southeast Asia, and the Western Pacific. There are an increasing number of case reports from outside endemic regions noting a history of travel to these areas. Dengue viruses are *Flaviviridae* spread through mosquito vectors. The predominant vectors are *A. aegypti* and *A. albopictus*. Other species that have been implicated include *Aedes polynesiensis* and the *Aedes scutellaris* complex. The clinical presentation of dengue fever ranges from a febrile illness to life-threatening DSS. Classically, the disease is characterized by symptoms that appear about 3–14 days after a bite from the vector. The main clinical features are an acute onset of high-grade fever ($>40^{\circ}\text{C}$) lasting 2–7 days, accompanied by classical symptoms of headache, myalgia, arthralgia, body ache, skin erythema, and facial flushing. Non-specific symptoms such as anorexia, nausea, and vomiting are also commonly present. Hemorrhagic manifestations such as petechiae and mucosal bleeding may also be observed. The pathogenesis of systemic dengue infection is currently believed to be multifactorial and complex but not understood fully, but factors that have been postulated in its pathogenesis include the humoral immune response, cell-mediated immune response, viral determinants, and host determinants. However, abducens nerve involvement, manifesting with lateral rectus paralysis following dengue, is so rare that it has only been reported once, earlier in literature Dengue fever is an acute febrile disease caused by the dengue virus. As the numbers of reported patients with dengue fever are increasing, rare complications associated with dengue fever, such as rhabdomyolysis or meningitis, are increasing in Korea.



Figure 1: Fundus picture.

In 1929, Anargyros^[2] described bilateral retrobulbar neuritis in a patient with dengue fever. Although optic neuropathy and oculomotor nerve palsy, following dengue fever has been reported in literature a few times previously, however, abducens nerve palsy has only been reported once earlier. Here, we have described the 2nd ever-reported case of abducens nerve palsy complicating dengue fever in a previously healthy male. We recommend that in a tropical country like ours with endemic dengue infection, dengue-related abducens neuropathy may be considered as a differential diagnosis in cases of acquired lateral rectus palsy.^[5] Diagnostic and monitoring investigations described included optical coherence tomography (OCT), fundus fluorescein angiography (FFA) and indocyanine green (ICG) angiography, visual field analysis, and electrophysiologic tests. Management is based on clinical presentation and includes active surveillance as well as various anti-inflammatory and immunosuppressive therapies. There have been no prospective, randomized therapeutic trials, and it is unclear if the disease is self-limiting or if treatment is actually beneficial. Prognosis varies ranging from full resolution to permanent vision loss despite intervention. Main symptoms include blurring of vision, scotomata, metamorphopsia, and floaters. Proposed mechanisms include direct viral infection as well as immunologic phenomena.

CONCLUSION

Dengue fever is increasingly seen in endemic and non-endemic regions as the result of increases in international travel, and thus, ophthalmologists should have the requisite knowledge to diagnose and manage such patients. The main ocular complications of dengue fever are maculopathy and hemorrhage. These are commonly present at the start of convalescence, closely associated with the nadir of thrombocytopenia. Investigations were chosen based on the presentation of the disease and may involve OCT, FFA, and ICG. Thus far, there have been no randomized control trials for the treatment of dengue maculopathy, but most patients have been managed with either active surveillance or anti-inflammatory therapy with corticosteroids or with Intravenous immunoglobulin G (IVIG). It is still unclear as to whether this is of any real benefit to the patient and should be an area of future study. Other unresolved issues that may require further research are risk factors of dengue eye disease and also preventive measures for ocular complications. Prognosis is varied and ranges from full recovery to persistent visual loss and residual scotomata. Since ocular abnormalities are now being commonly encountered in patients with dengue fever, we also recommend that a dilated funduscopy should be performed as a routine in all patients presenting with severe forms of the disease. Ophthalmologists should carefully assess patients with dengue-related eye disease

because some patients may have poor visual acuity and exhibit refractoriness to treatment. Treatment systemic corticosteroids may prove beneficial in patients with poor presenting visual acuity, progressive ocular symptoms, and optic nerve lesions with or without macular involvement.

A myriad of Ocular manifestations ranging from non-specific symptoms to severe retinal manifestations occur in Dengue fever. Further studies are needed to validate the triad of ocular symptoms as a screening tool for severe ocular complications following dengue infection.

Ethical approval

Institutional Review Board approval is not required.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Conflicts of interest

There are no conflicts of interest.

Use of artificial intelligence (AI)-assisted technology for manuscript preparation

The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

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