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## A study of ophthalmic manifestations in dengue fever

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### Abstract

Dengue virus is a positive sense RNA virus of the flavivirus family with at least four distinct serotypes. It is the cause of dengue fever which is associated with headache, retro-orbital pain, joint and bone pain (hence "breakbone fever"), fever and rash. The most serious form of dengue infection is known as dengue hemorrhagic fever which is characterized by thrombocytopenia and potentially multi-system organ failure. Dengue is a mosquito-borne viral illness that is spreading rapidly to become endemic in tropical and subtropical regions of the world. Infection with one serotype results in long-term immunity only to that specific serotype, and not to the others therefore a person can be infected many times with the virus. Dengue often is difficult to diagnose, and a presumptive diagnosis is established initially based on clinical signs and symptoms, while waiting for laboratory confirmation.

**Keywords:** Ophthalmic manifestations, dengue, fever

### Introduction

Dengue fever is caused by mosquito and the virus belongs to the group Flavivirus of the family flaviviridae. Dengue infection is an acute infection which manifests after an incubation period of 2-7 days and is characterised by high grade fever, malaise, joint pain, rhinitis, sore throat. A transient macular rash may be identified on the 1 or 2 day of illness which disappears followed by the appearance of maculopapular rash on 3 to 6 day of illness. This rash is seen on the trunks, limbs, and face sparing the palms and soles. Blood dyscrasias include thrombocytopenia and leukopenia. Typical Ocular manifestations includes retinal haemorrhages, Roth spots, macular edema, optic disc [1, 2, 3] edema and capillary occlusion. Macular haemorrhages are the common finding. Early diagnosis of dengue infection and management can prevent ocular complications [4].

Dengue infection is an acute infection which can manifest with ocular features in some patients. The aim of this study is to evaluate ophthalmic manifestations in dengue patients. Patients diagnosed with dengue fever were included in this study and the patients were evaluated for ophthalmic manifestations [5, 6, 7]. Out of the 18 patients, 15 patients did not show any significant ophthalmic manifestation. 1 patient showed Macular edema, 1 patient had Sub-Conjunctival Haemorrhage and 1 patient showed Optic disc edema with macular edema. These complications suggest the importance of ophthalmic evaluation in dengue patients.

**Aims and Objectives:** To study the ophthalmic manifestations in dengue fever.

### Materials and Methods

The study was conducted in Srinivas Institute of Medical Sciences. This study was conducted in 30 patients who were proved to be dengue positive.

The study was done from Oct 2018 to Sept 2019

**Inclusion Criteria:** All were sero positive

### Exclusion Criteria

On steroid and chemo therapy.

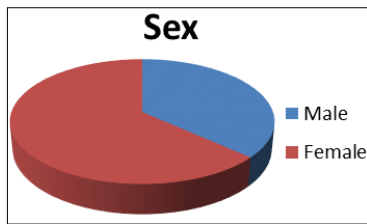
On Immuno-modulator therapy

Had known ocular pathology.

**Results**

**Table 1:** Age Distribution

20-30 years	13
31-40 years	11
41-50 years	04
51-60 years	02



**Fig 1:** Sex Distribution:

**Table 2:** Ocular Manifestations

Blurring of vision	30
Unilateral blurring	21
Bilateral blurring	09
Visual Acuity chart	Range 20/25 to 20/100
Central scotoma	26
Macular oedema	25
Macular haemorrhage	02
Vasculitis	01
Retinal detachment	Nil
Cotton wool spots	01
Anterior uveitis	01

**Discussion**

Dengue virus can manifest clinically in the eye as either ocular inflammation or as hemorrhagic complications. Uveitis from anterior to panuveitis can occur in this disease. Subconjunctival hemorrhage is a very common findings during acute illness. Anterior uveitis has been noted during both the acute illness and up to 5 months after disease remission and can occur in asymptomatic individuals. More severe vision threatening complications include serous retinal detachments and choroidal effusions. Dengue associated maculopathy is one of the most common posterior segment findings that include both retinal hemorrhages, cotton wool spots, and macular edema. The Eye Institute Dengue-Related Ophthalmic Complications Workgroup described optical coherence tomography (OCT) findings and reported 3 patterns of disease: Type 1: diffuse retinal thickening, Type 2: cystoid macular edema, Type 3: foveolitis. In one retrospective review of 13 patients, 22 eyes were affected with a variety of manifestations including anterior uveitis, maculopathy, serous retinal detachments, and vasculitis. Notably patients' symptoms occurred at the nadir of platelet count suggesting possible mechanism for ophthalmic complications.

Recently Agarwal *et al.* reported the multimodality imaging in Dengue associated foveolitis and maculopathy. In their retrospective review of 16 patients (32 eyes), they reported foveolitis (disruption of outer retina) in 75% of eyes and observed flow voids in the superficial and deep capillary plexus on optical coherence tomography that persisted after treatment. They suggested that the pathogenesis of the ocular findings include both inflammation and ischemia. Dengue hemorrhagic fever (DHF) is a severe and potentially

fatal form of the disease. Twenty-five thousand deaths are reported annually to the World Health Organization (WHO). The annual incidence now exceeds 500,000 cases annually and is still rising, despite environmental controls. DHF is strongly related to previous sensitization of heterologous dengue infection. Increasing endemicity and co-circulation of different serotypes is therefore necessary for the increase in incidence of DHF.

DF is characterized by an abrupt onset of fever after a 2- to 7-day incubation period, with temperatures reaching 41 °C. Other symptoms include severe malaise, headaches, and retroorbital and lumbrosacral pain. Patients also experience respiratory symptoms (sore throat, rhinitis, and cough), nausea, anorexia, and altered taste sensation. A transient macular rash is often seen on day 1 to day 2 of illness. This rash disappears, but a second, maculopapular rash appears on days 3–6 of illness. The secondary rash coincides with defervescence and typically involves the trunks, limbs, and face; palms and soles are spared. Blood dyscrasias include thrombocytopenia and neutropenia (leukopenia). The illness is usually self-limiting with minimal systemic sequelae, but it may require prolonged convalescence lasting several weeks [8, 9, 10].

DHF is defined by WHO as DF associated with thrombocytopenia (<100 × 10<sup>9</sup> cells/L) and hemoconcentration (hematocrit >20% above baseline). Its most severe form, dengue shock syndrome (DSS), is associated with hypotension, narrowing of pulse pressure (<20 mm Hg), and circulatory failure in 30% of cases. The early phase of DHF is indistinguishable from DF. The death rate for untreated DHF/DSS can be as high as 10%–15% in places where emergency supportive treatment with intravenous fluids and platelet replacement is not readily accessible [12, 13].

Ophthalmic complications associated with DF and DHF have not been classically described. Within the ophthalmic community, this complication is being observed more frequently in recent times. However, only a few isolated case reports have been published. These reports attribute ocular complications to the transient thrombocytopenia and resulting bleeding diathesis.

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