

Dengue Fever: A Sight-threatening Ailment

Sandeep Shivran¹, Daya C Gupta²

ABSTRACT

Introduction: Dengue fever, a mosquito-borne viral disease endemic in tropical and subtropical areas. In humans, it is transmitted by the infected female *Aedes aegypti* mosquito. In dengue fever, the symptoms range from flu-like symptoms to lethal complications, along with ocular manifestations and other positive laboratory findings.

Objective: The aim of this study was to evaluate the ophthalmic manifestations allied with the dengue fever.

Materials and methods: The study was carried out in 150 indoor patients diagnosed with dengue fever. All indoor patients underwent complete systemic and ophthalmic examination in Department of Ophthalmology, Mahatma Gandhi Medical College and Hospital, Jaipur, Rajasthan, India.

Results: A total of 150 patients were diagnosed with dengue fever, of which 95 (63.3%) were men and 55 (36.7%) were women. The study group ranges between 20 years and 60 years. Of the 150 patients, only 88 patients (58.7%) were having ocular manifestations. Subconjunctival hemorrhage is noted in 68 patients (45.3%). Anterior uveitis in 5 (3.3%) patients, panuveitis in 1 (0.7%) patient, retinal hemorrhages in 12 (8%) patients, macular edema in 1 (0.7%) patient, and bilateral optic neuritis in 1 (0.7%) patient. Ocular manifestations resolved in all the cases that came for followup except one case of bilateral optic neuritis. Platelet count improvement also attributed for the same.

Conclusion: The inference is that the clinicians should have a heightened awareness of dengue-related ophthalmic complications and should facilitate a prompt referral for ophthalmic assessment and management, so that with early interventions, we can restore the vision.

Keywords: Dengue fever, Macular edema, Ocular manifestations, Optic neuritis.

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INTRODUCTION

Dengue fever is a mosquito-borne viral disease endemic in tropical and sub tropical areas. In humans, it is transmitted by the infected female *Aedes aegypti* mosquito and is the most prevalent form of flavivirus infections. Of an estimated 2.5 billion people at risk for dengue globally, about 70% live in Asia Pacific countries. Climate conditions, unclean environments, unplanned urban settlements, and rapid urbanization can lead to increased mosquito breeding, especially in urban and semi-urban areas.¹

Dengue viral infection is characterized by a sudden onset of fever with flu-like symptoms, respiratory symptoms (sore throat, rhinitis and cough), retro-orbital pain, lumbosacral pain, altered taste sensation, anorexia, skin rash, and bleeding diathesis from thrombocytopenia.

Other clinical manifestations of dengue are related to the bleeding diathesis from thrombocytopenia.² Ophthalmic signs in dengue viral fever were formerly not well defined but now can be seen with increasing frequency in recent literature.³⁻⁹ The ocular signs included subconjunctival hemorrhages, retinal hemorrhages, and macular edema. Other common features involved anterior uveitis, periphlebitis, exudative retinal detachment, vitreous hemorrhage, and branch retinal vein occlusion. A majority of patients were reported to have residual visual impairment secondary to maculopathy and optic neuropathy.^{5,8} The main objective of this study was to evaluate the ophthalmic manifestations allied with dengue fever.

MATERIALS AND METHODS

A prospective observational study was carried out in 150 indoor diagnosed dengue fever patients at the department of ophthalmology, Mahatma Gandhi Medical College and Hospital, Jaipur, Rajasthan. The diagnosis was made on the basis of clinical symptoms and signs and confirmed by serological testing (IgG and IgM antibody assay) and decreasing platelet counts. All patients

^{1,2}Department of Ophthalmology, Mahatma Gandhi Medical College and Hospital, Mahatma Gandhi University of Medical Sciences and Technology, Jaipur, Rajasthan, India

Corresponding Author: Daya C Gupta, Department of Ophthalmology, Mahatma Gandhi Medical College and Hospital, Mahatma Gandhi University of Medical Sciences and Technology, Jaipur, Rajasthan, India, Phone: +91 9829285185, e-mail: drdcgupta@gmail.com

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were asked thorough history with significance to visual symptoms. Detailed systemic examination and laboratory findings were recorded. All patients were evaluated in detail for best corrected visual acuities, which were recorded with Snellen's acuity chart for both far and near. A slit lamp examination was done for anterior segment evaluation. A dilated fundus examination with +90 D and indirect ophthalmoscopy with +20 D were done. Fundus photos were taken with a fundus camera. The patients with positive ocular findings were advised to revisit weekly for followup.

RESULTS

A total of 150 patients were diagnosed with dengue viral fever, of which 95 (63.3%) were men and 55 (36.7%) were women (Fig. 1). The study group ranged between 20 years and 60 years. Of the 150 patients, only 88 patients (58.7%) were having ocular manifestations. Subconjunctival hemorrhage in seen in 68 patients (45.3%). Anterior uveitis in 5 (3.3%) patients, panuveitis in 1 (0.7%) patient, retinal hemorrhages in 12 (8%) patients, macular edema in 1 (0.7%) patients, and bilateral optic neuritis in 1 (0.7%) patient (Fig. 2). Patient

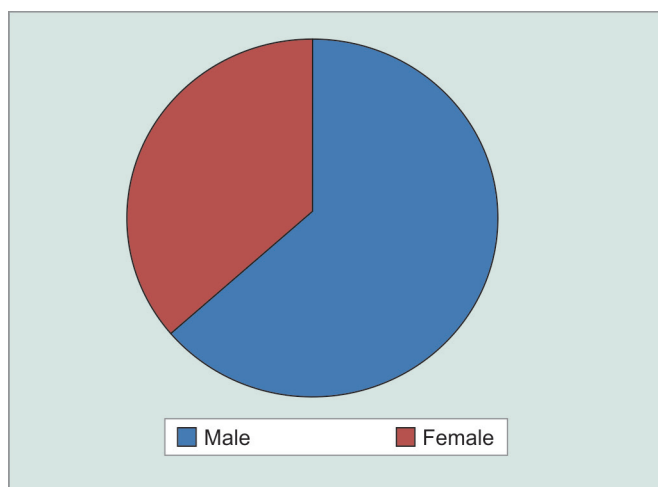


Fig. 1: Gender distribution

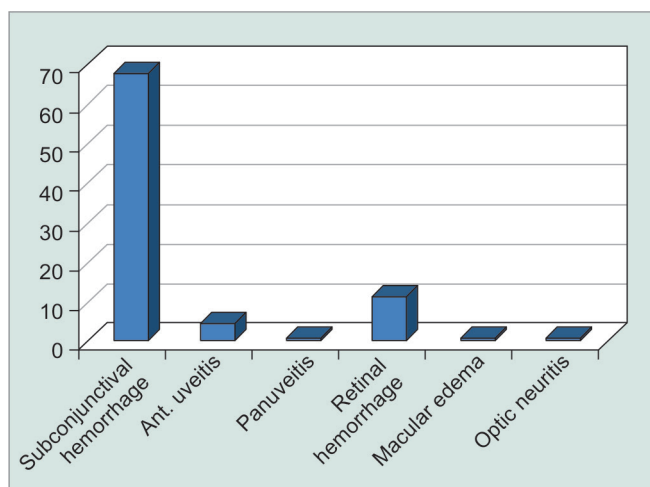


Fig. 2: Ocular manifestation

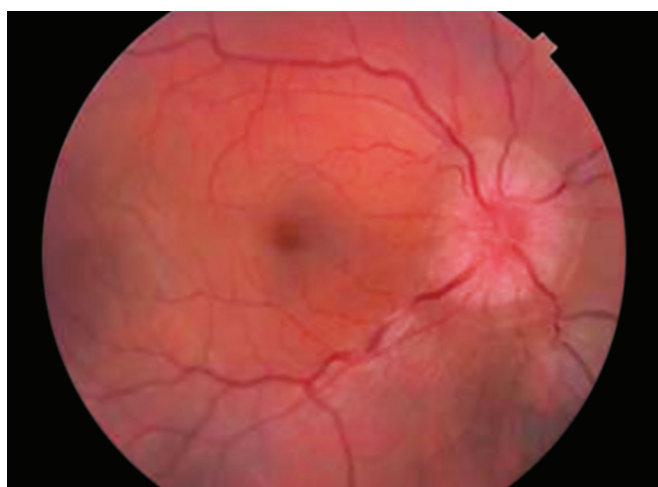


Fig. 3: Blurred disk margins, as well as disk hyperemic

who were having thrombocytopenia (platelet count $<50,000/\mu\text{L}$) have severe ocular manifestations.

Ocular manifestations were present in 88 patients, in which 68 (45.3%) had subconjunctival hemorrhage (petechial and diffuse) type as the most frequent anterior segment findings.

Posterior segment manifestations were present in 14 (9.3%) patients, of which 12 (85.7%) had retinal hemorrhages. Only one patient had panuveitis and one had bilateral optic neuritis (Fig. 3). Ocular manifestations subsided in all the cases who revisited the opd for followup except one case of bilateral optic neuritis. In B/L optic neuritis in which after treatment and recovery from dengue fever patient vision not improved and it was PL NEGATIVE and In VEP P100 latencies non recordable in BE.

Panuveitis in which after treatment and recovery from dengue fever patient vision improved significantly from PL+, PR+ in all quadrants, HMCF to 6/9 in LE (Fig. 4)

DISCUSSION

Dengue viral fever is utmost significant emerging disease affecting the humans, particularly in Southeast Asian region, posing a community health issue.¹⁰ Dengue is a transmissible disease in which one of the four dengue viruses is transmitted by the bite of

infected female *Aedes* mosquito. Infection from one serotype after recovery delivers lifetime immunity against that individual serotype. Infection with other serotypes will increase the risk of developing severe dengue viral fever.

Dengue fever can lead to diverse ocular manifestations extending from subconjunctival hemorrhage to optic neuritis. The mechanism is not well known but suggestive of an immune mediated manner and probably infective etiology.¹¹ The causes of bleeding could be platelet dysfunction, consumptive coagulopathy, capillary fragility, and thrombocytopenia with coagulation defects.¹² Usually, ocular symptoms in dengue fever completely resolve.

Subconjunctival hemorrhages and anterior uveitis are frequent manifestations in anterior segment.^{15,16} Periorbital ecchymosis, ptosis, and globe rupture are few very rare manifestations.^{3,17,18}

Vascular occlusion, macular edema, optic neuropathy, vitreous hemorrhage, vasculitis with retinal hemorrhages, chorioretinitis, and cotton wool spots are the reported manifestations in the posterior segment.^{4,5,8,13,14}

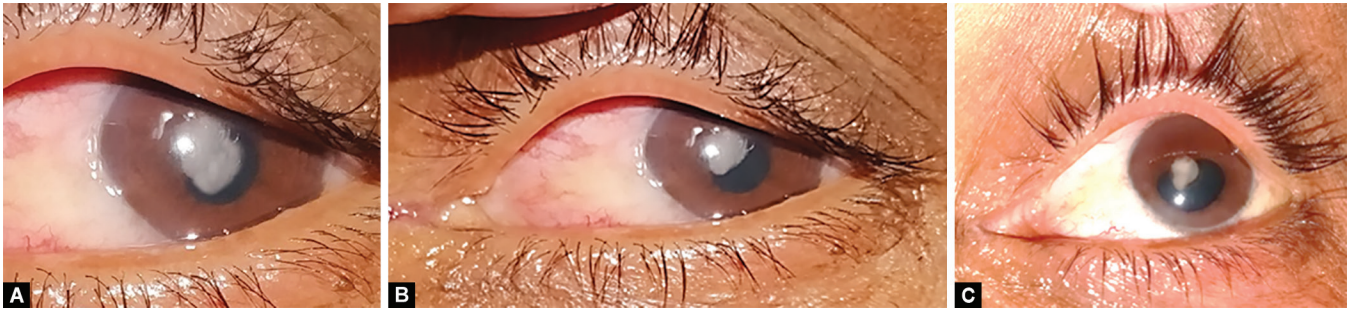
Our study is comparable to that of Kapoor et al.¹⁵ and Hussain et al.³ with regard to male preponderance. Overall, 83% of our patients had a platelet count of $<50,000/\mu\text{L}$, and patients who had platelet count of $<40,000/\mu\text{L}$ all had ocular complications as associated with the study reported by Kapoor et al.,¹⁵ which had 90.7% of similar relations. The onset of ophthalmic association in our patients related with the nadir of thrombocytopenia as reported in other studies.^{3,9,13,18}

Subconjunctival hemorrhage was the most common ophthalmic manifestation in our study, which was followed by retinal hemorrhages. It was comparable to the studies by Kapoor et al.¹⁵ and Hussain et al.³ In our study, one patient was presented with bilateral optic neuritis and one with panuveitis.

Anterior uveitis and conjunctival chemosis, cotton wool spots, hard exudates, and retinal vasculitis are few common findings. In our patients, ocular manifestations extending in anterior and posterior segments in comparison to the study reported by Lim et al.⁸

CONCLUSION

Dengue fever can lead to diverse ocular manifestations extending from subconjunctival hemorrhage to optic neuropathy. The inference is that the clinicians should have a heightened awareness



Figs 4A to C: Panuveitis with exudative membrane showing improvement on: (A) Day 1; (B) Day 3; (C) 1 week after treatment

of dengue-related ophthalmic complications and should facilitate prompt referral for ophthalmic assessment and management, so that with early interventions, we can restore the vision.

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