

## OCULAR FINDING IN DENGUE PATIENTS

RASHAM IJAZ<sup>1</sup>, ANAM SARWAR<sup>2</sup>, ZEESHAN HAMEED<sup>3</sup>, SAIMA JAMSHED<sup>4</sup>,  
IRFAN QAYYUM MALIK<sup>5</sup>, USAMA BASIRAT<sup>6</sup>

<sup>1,2&3</sup> Postgraduate Resident (Ophthalmology) Gujranwala Medical College / DHQ Teaching Hospital, Gujranwala, <sup>4</sup>Consultant Ophthalmologist Gujranwala Medical College / DHQ Teaching Hospital, Gujranwala, <sup>5</sup>Associate Professor/ HOD Ophthalmology Gujranwala Medical College / DHQ Teaching Hospital, Gujranwala, <sup>6</sup>House Officer, Ophthalmology Gujranwala Medical College / DHQ Teaching Hospital, Gujranwala

### ABSTRACT

**Background:** To find out ocular findings in dengue patients during dengue epidemic of 2022 in Pakistan. Descriptive Cross-sectional study at ophthalmology Department, DHQ Teaching Hospital, Gujranwala from 1<sup>st</sup> October, 2022 to 31<sup>st</sup> December 2022 (3 months).

**Method:** After taking informed consent and approval from ethical review committee, all patients presented in the dengue ward were enrolled in this study who were tested positive for IGG And IGM antibodies. Demographic data like, age, gender, platelet count, visual acuity, anterior segment and posterior segment evaluation were recorded of all patients. All patients of hypertension, diabetes and other comorbidities were excluded from study. Statistical analysis of data was done using SPSS Version 25.

**Results:** A total of 150 patients were included in this study out of which 114 (75%) were males and 38 (25%) were females. Age range was 13 to 69 years. Maximum number of patients were found to be in the age range of 15-45 years. Maximum patients had platelet count range of 50-150/um. The most obvious ocular symptoms were subconjunctival hemorrhage (35%) followed by retinal hemorrhages (24%).

**Conclusion:** Subconjunctival hemorrhage is most common ocular finding in dengue patients followed by retinal hemorrhage. Thrombocytopenia predisposes to spontaneous ocular hemorrhages.

**Key Words:** Dengue, Epidemic, Ocular Findings

How to cite this article: Ijaz R, Sarwar A, Hameed Z, Jamshed S, Malik IQ, Basirat U. Ocular Finding in Dengue Patients. Pak Postgrad Med J 2024;35(4): 174-177

---

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/3.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

DOI: <https://doi.org/10.51642/ppmj.v35i04.663>

Correspondence to: Zeeshan Hameed  
Postgraduate Resident (Ophthalmology) Gujranwala  
Medical College / DHQ Teaching Hospital, Gujranwala

Email: [zeeshanhameed097@gmail.com](mailto:zeeshanhameed097@gmail.com)

### INTRODUCTION

A mosquito borne arbovirus disease known as dengue fever; borne by aedes mosquito is fatal and responsible for 25000 deaths per year all over the world with highest rate in tropical and subtropical areas out of which countries like south Asia, India and America have more

ratio. According to WHO 40 % of world population is at risk of dengue fever yearly in about 100 countries<sup>1,2</sup>.

Dengue fever present with high grade fever temperature reaching up to 41 degrees after 2 to 7 days of incubation period. In this fever patient may experience general symptoms like malaise, headache, retro-orbital pain and lumbosacral pain while others have respiratory symptoms like sore throat, rhinitis, cough, nausea, anorexia and altered taste sensation. A characteristic macular or maculopapular rash involve limb trunk and face is mostly there. Blood dyscrasias include thrombocytopenia and neutropenia (leukopenia). This fever is mostly self-limiting<sup>3</sup>.

Various theories regarding pathogenesis of this diseases of which one proposed that replication of virus occur in macrophages and interaction of virus with host immunological and chemical mediated system which leads to disruption in endothelial microvascular permeability and thrombo regulatory system with losses of protein and plasma. Thrombocytopenia; may be associated with megakaryocytopoiesis initiated by infection of hematopoietic cells and results in platelet dysfunction and destruction, and a leading cause of hemorrhage.

There are four serotypes of dengue:

- Undifferentiated febrile illness or viral syndrome
- Classic DF
- Dengue hemorrhagic fever (DHF)
- Dengue shock syndrome (DSS)<sup>4</sup>.

Ocular complication of dengue fever has not classically described by ophthalmologist till now only a few case reports are there and in these thrombocytopenia seems to be the cause other pathogenic factors which play role in dengue eye disease include viral virulence, their serotype, mutation, host susceptibility, geographic factor and many others while hemorrhage is due to thrombocytopenia and immune mediated mechanisms<sup>5,18</sup>. To date no proper study has been conducted to find out the incidence of ocular complication in dengue patients as most of the case reports shows sight threatening complication.

## METHODS

It is a hospital based observational study done in Dengue Ward, District Headquarter Hospital, Gujranwala from 1<sup>st</sup> October 2022 to 31<sup>st</sup> December 2022 (3 months). Approval was taken from hospital ethical review board; verbal consent was also taken from all the patients. All patients presented in the dengue ward were enrolled in this study who were tested positive for IGG And IGM antibodies. Detailed history from exposure to mosquito and use of protective measures were taken from all patients. Demographic data like, age, gender, platelet count, visual acuity, anterior segment and posterior segment evaluation were recorded of all patients. Visual equity is evaluated through Snellen's chart. Anterior segment is examined with the torch of all patients. Posterior segment is evaluated with a distant direct ophthalmoscope. All patients of hypertension, diabetes and other comorbidities were excluded from study. Platelets were evaluated twice on daily basis. All patients included in this study were evaluated for ocular signs and symptoms related to dengue, fever and to make awareness for use of protective measures. All data is saved for analysis and used for later. Statistical analysis was done using statistical program for social sciences (SPSS) Version 25.

## RESULTS

A total of 150 patients were included in this study, which were admitted in dengue ward of DHQ Gujranwala, out of which 114 (75%) were males and 138 (25%) were females [Table (1)] Age range <15 years has 3 (1.97%) males and 0 females. Age range 15-30 years has 50 (32.8%) males and 11 females (7.23%). Age range 30-45 years 35 (23.0%) males and 14 (9.21%) females. Age range greater than 45 years has 26 (17.10%) males and 13 (8.55%) females. Maximum number of male patients were found to be in the age range of 15-30 years. Maximum number of female patients were found to be in range of 30-45 years.

In our study, all the patients lie in the platelet count range of 50-150. 32 patients (21.0%) have platelets count of less than 50.74 (48.6%) patients has platelet count range of 50-100. 34 patients (22.3%) have 100-150 platelet count range. 12 patients (7.89%) have < >150 platelet count.

Eye strain followed by retro-orbital pain and blurry vision were most common presenting features. Different ocular findings are described in Figure (1).

Gender	Number (n)	Percentage %
<b>Male</b>	114	75%
<b>Female</b>	38	25%
<b>Total</b>	152	100%

Table 1: Frequency Distribution of Gender

Age	Male	Percentage	Female	Percentage%
<b>&gt;15</b>	3	1.97%	0	0%
<b>15-30</b>	50	32.89%	11	7.23%
<b>30-45</b>	35	23.02%	14	9.21%
<b>&lt;45</b>	26	17.11%	13	8.55%
<b>Total</b>	114	75%	38	25%

Table 2: Frequency Distribution of Age

Platelet Count	Number	Percentage
>50	32	21.05%
50-100	74	48.68%
100-150	34	22.36%
<150	12	7.89%

Table 3: Frequency Distribution of Platelet Count

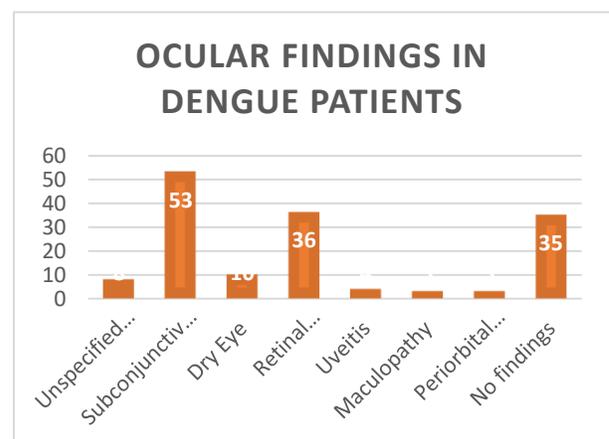


Figure 1: Frequency Distribution of Ocular Findings

## DISCUSSION

Dengue fever is mosquito born viral disease effecting human being all around the world is a known global challenge. Its ophthalmic effects reside in case reports only that shows it may reveal in form of macular edema<sup>6</sup>. Ocular manifestations of dengue fever affect both ant and posterior segment of eye. Different case reports and meta-analysis of these case reports done during past decade but still these complications are rare. Anterior segment complications like conjunctivitis, sub conjunctival hemorrhage, uveitis and posterior segment complications include macular edema, vascular occlusions, vitreous hemorrhage, optic neuropathy, vasculitis, retinal hemorrhage, cotton wool spots and retinal detachment<sup>2,8,5,9,10,20</sup>. Another rare side effect include ptosis, periorbital ecchymosis and panophthalmitis<sup>11,12,19</sup>.

We conducted an observational study at DHQ teaching hospital to find out rate of ocular complications among patients with dengue fever in our setup. Total 150 patients were included we find out that male percentage 75% is more than female 25% and among them young male between 15 and 30 years show highest ratio which is also reported previously as exposure is more in male due to more outdoor activity as compare to female it was also noted that out of these most of the patients belong to teen and middle age suggests that viral transmission occur side house<sup>7</sup> there is another study; also reporting that male percentage is much more than female<sup>6</sup>.

Most of the patients presented with systemic manifestations, landed in medical outdoor or emergency except the one patient who presented in eye outdoor with sub conjunctival hemorrhage having other systemic symptoms like retro orbital pain, fever, and body aches for which workup was done to rule out dengue. Almost all the patients had fever associated with headache, body ache retro orbital pain which was also comparable to previous study<sup>8</sup>. Platelet count marked effect the rate of complications, low platelet count means high rate of complications, ocular findings like sub conjunctival hemorrhage was present in population having platelet count less the 50.74 like Kapoor reported sub conjunctival hemorrhage as the most common ophthalmic complication of dengue patients<sup>14</sup>. None of these patients had any association with Roth spots or cotton wool spots on funduscopy although non-specific retinal hemorrhages were common finding<sup>11,12</sup>. In our study we included all the patients admitted in hospital with dengue fever there was no specification of visual symptoms or systemic symptoms like in oct based macular edema on which all the patients have visual symptoms and referred by other due to visual complaints<sup>13,16</sup>. None of the patient in our study had dengue chorioretinitis like the case reported by Stephen although

few had maculopathy<sup>14</sup>. Different patients presented after the resolution of symptoms with ophthalmic complications when they are followed may be due to complication of medications used for treatment or the disease itself<sup>15</sup> but due to lack of follow-up of patients we might have missed some findings. There was no intraocular bleeding in any of our case except sub conjunctival hemorrhage which contradicts to the case reported by Nagaraj in which there was hemorrhage in anterior and posterior segment and leads to sight threatening globe perforation<sup>17,21</sup>.

In conclusion, subconjunctival hemorrhage is most common ocular finding in dengue patients followed by retinal hemorrhage. Thrombocytopenia predisposes to spontaneous ocular hemorrhages.

## CONFLICT OF INTEREST:

Authors declare no conflict of interest.

## FUNDING SOURCE: None

## ETHICAL APPROVAL

Ethical approval was granted by the Institutional Review Board of Gujranwala Medical College/DHQ Teaching Hospital, Gujranwala. vide Reference No Admn/159/GMC Dated 31/10/2022

## AUTHOR'S CONTRIBUTIONS

**RI, AS, UB:** Manuscript writing and data collection

**ZH:** Manuscript writing and statistical analysis

**SJ, IQM:** Supervision and manuscript review

**ALL AUTHORS:** Approval of the final version of the manuscript to be published

## REFERENCES

1. Martheswaran TK, Hamdi H, Al-Barty A, Zaid AA, Das B. Prediction of dengue fever outbreaks using climate variability and Markov chain Monte Carlo techniques in a stochastic susceptible-infected-removed model. *Scientific Reports*. 2022 Mar 31;12(1):1-7. DOI: 10.1038/s41598-022-09489-y
2. Chan, D.P., Teoh, S.C., Tan, C.S., Nah, G.K., Rajagopalan, R.. Dengue-Related Ophthalmic Complications Workgroup, 2006. Ophthalmic complications of dengue. *Emerging infectious diseases*, 12(2), p.285. DOI: 10.3201/eid1202.050274
3. Gubler, D.J., 2002. Epidemic dengue/dengue hemorrhagic fever as a public health, social and economic problem in the 21st century. *Trends in microbiology*, 10(2), pp.100-103. DOI: 10.1016/s0966-842x(01)02288-0

4. Roopashri, G., Vaishali, M.R., David, M.P., Baig, M. Clinical and oral implications of dengue fever: a review. *J Int Oral Health: JIOH*, 7(2), p.69.
5. Lim, W.K., Mathur, R., Koh, A., Yeoh. Ocular manifestations of dengue fever. *Ophthalmology*, 111(11), pp.2057-2064. DOI: 10.1016/j.ophtha.2004.03.038
6. Intizar Hussain, F.C.P.S., Afzal, F., DOMS, A.S., 2012. Ophthalmic manifestation of dengue fever. *An official journal of Peshawar Medical College*, 10(1), p.93.
7. Anker, M., Arima, Y., 2011. Male–female differences in the number of reported incident dengue fever cases in six Asian countries. *Western Pacific surveillance and response journal: WPSAR*, 2(2), p.17. DOI: 10.5365/WPSAR.2011.2.1.002
8. Yip, V.C.H., Sanjay, S. and Koh, Y.T., 2012. Ophthalmic complications of dengue fever: a systematic review. *Ophthalmology and therapy*, 1, pp.1-19. DOI: 10.1007/s40123-012-0002-z
9. Tavassoli, S., Carreño, E., Teoh, S.C., Theodoropoulou, S., et al, 2016. Optical coherence tomography angiography findings in dengue-related maculopathy: a case report. *Ophthalmic Surgery, Lasers and Imaging Retina*, 47(11), pp.1057-1060. DOI: 10.3928/23258160-20161031-12
10. Sanjay, S., Wagle, A.M., Au Eong, K.G., 2008. Optic neuropathy associated with dengue fever. *Eye*, 22(5), pp.722-724. DOI:10.1038/eye.2008.64
11. Bronnert, J., Malhotra, C., Suavansri, K., Hanvesakul., 2005. Complete ptosis caused by dengue fever. *The Lancet*, 366(9501), p.1982. DOI: 10.1016/S0140-6736(05)67791-4
12. Kumar, V., Ghosh, B., Raina, U.K., Goel, N. 2009. Bilateral periorbital ecchymosis in a case with dengue fever. *Indian Journal of Ophthalmology*, 57(3), pp.242-243. DOI: 10.1016/S0140-6736(05)67791-4
13. Kapoor, H.K., Bhai, S., John, M., Xavier, J., 2006. Ocular manifestations of dengue fever in an East Indian epidemic. *Canadian journal of ophthalmology*, 41(6), pp.741-746. DOI: 10.3129/i06-069
14. Teoh, S.C., Chan, D.P., Laude, A., Chee, C., Lim, T.H., Goh, K.Y., 2006. Dengue chorioretinitis and dengue-related ophthalmic complications. *Ocul Immunol Uveitis Found*, 9(4), pp.1-19.
15. Somkijrungrroj, T., Kongwattananon, W., 2019. Ocular manifestations of dengue. *Curr. Opin. Ophthalmol*, 30(6), pp.500-505. DOI: 10.1097/ICU.0000000000000613
16. Teoh, S.C., Chee, C.K., Laude, A., Goh, K.Y., Barkham, T., Ang, B.S. Eye Institute Dengue-related Ophthalmic Complications Workgroup, 2010. Optical coherence tomography patterns as predictors of visual outcome in dengue-related maculopathy. *Retina*, 30(3), pp.390-398. DOI: 10.1097/IAE.0b013e3181bd2fc6
17. Nagaraj, K.B., Jayadev, C., Yajmaan, S., Prakash, S., 2014. An unusual ocular emergency in severe dengue. *Middle East Afr. J. Ophthalmol*, 21(4), p.347. DOI: 10.4103/0974-9233.142276
18. Ng, A.W. and Teoh, S.C., 2015. Dengue eye disease. *Surv. Ophthalmol*, 60(2), pp.106-114. DOI: 10.1016/j.survophthal.2014.07.003
19. Sriram, S., Kavalakatt, J., Pereira, A. and Murty, S., 2015. Bilateral panophthalmitis in dengue fever. *Annals of Tropical Medicine and Public Health: ATMPH*, 8(5), p.217. DOI:10.4103/1755-6783.159837
20. Agarwal, L., Agrawal, N., 2020. Retinal vasculitis with macular infarction: a dengue-related ophthalmic complication. *Int. Med. Case Rep. J.*, pp.363-366. DOI: 10.2147/IMCRJ.S264324
21. Lucena-Neto, F.D., Falcão, L.F.M., Moraes, E.C.D.S., David, J.P.F., Vieira-Junior, A.D.S., Silva, C.C., et al. Dengue fever ophthalmic manifestations: A review and update. *Reviews in Medical Virology*, 33(2), p.e2422. DOI: 10.1002/rmv.2422