

Original Research Article

Spectrum of ocular manifestations and its correlation to platelet count in dengue patients

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ABSTRACT

Background: Dengue is most prevalent mosquito borne viral disease. Evaluation of various ocular manifestations of dengue fever and its associated laboratory investigations were done.

Methods: A cross sectional observational study was conducted on dengue patients from September 2021 to November 2021. A total 56 diagnosed patients of dengue were included in our study with age ranging between 8-70 years. A detailed systemic history followed by ocular examination including best corrected visual acuity with Snellen's chart for both near and distance, slit lamp bio-microscopy and dilated fundus examination was carried out.

Results: Out of 56 patients 50 patients (89.3%) had ocular findings: subconjunctival haemorrhage 26 cases (46.4%), retinal haemorrhages-15 cases (26.8%), cotton wool spots-9 cases (16.1%). On serological examination 39 cases (69.6%) were positive for NS1 Ig-M and 26 cases (46.4%) were positive for NS1-Ig G. Mean haemoglobin was 8.97%.

Conclusions: Due to the surge in severity of ocular involvement it becomes imperative that the treating physician should be aware regarding the ocular manifestations. Thus, timely reference of the patient to an ophthalmologist can decrease sight threatening complications.

Keywords: Dengue fever, Subconjunctival haemorrhage, Retinal haemorrhage, Cotton wool spot, Thrombocytopenia

INTRODUCTION

Dengue is most prevalent mosquito borne viral disease. The infective virus belongs to family of *Flaviviridae*. It has four different serotypes (DEN1-4).^{1,8,10} The infected female *Aedes aegypti* transmits the viral disease.² It is associated with various systemic complications including ocular manifestations.

People residing in endemic areas, do not acquire cross protective immunity from the other serotypes.⁷ Each year 50-100 million people get infected with dengue worldwide, highest incidence occurring in southeast Asia and American tropics.³ Factors such as age, immune status, genetic predisposition, strain and serotype of the virus determine the outcome of disease.⁷ The epidemics

of dengue have increased in urban areas of India due to warm temperature and humidity which play important role in growth of mosquito population and transmission of disease.

Clinically five different presentations of dengue fever have been observed: nonspecific febrile illness, classical dengue fever, dengue haemorrhagic fever, dengue haemorrhagic fever with shock syndrome and other unusual symptoms like hepatitis and encephalopathy.¹³⁻¹⁵ Typical dengue fever is characterized by acute onset of biphasic high-grade fever along with myalgia, malaise, sore throat, cough, headache, vomiting, rash, retro-orbital pain and joint pain.³ Some other manifestations are related to bleeding diathesis as a result of thrombocytopenia and hence it can get converted into

haemorrhagic manifestation. Ocular manifestations of dengue fever include blurring of vision, retro orbital pain, subconjunctival haemorrhages, chemosis, retinal haemorrhages and less common features such as- anterior uveitis, peri phlebitis, vitreous haemorrhages.¹²

Aim

To determine the ophthalmic manifestations and its correlation to platelet count in dengue patients in a tertiary care hospital of southern Rajasthan

METHODS

A cross sectional observational study was conducted on dengue patients from September 2021 to November 2021 at the department of ophthalmology along with the department of medicine, Geetanjali medical college and hospital, Udaipur.

Inclusion criteria

Patients having serological positive NS1, IgM, IgG or both (IgM+IgG) of dengue fever were included in study.

Exclusion criteria

Patients having febrile illness apart from dengue viral fever, patients with co-morbidities like hypertension, diabetes mellitus, bleeding disorder etc., patients on antiplatelet medicines and informed consent could not be obtained from patients were excluded from the study.

A total 56 diagnosed patients of dengue were included in our study with age ranging between 8-70 years. A detailed systemic history followed by ocular examination including best corrected visual acuity with Snellen's chart for both near and distance, slit lamp bio-microscopy and dilated fundus examination was done with the help of indirect ophthalmoscopy. Fundus photography was done whenever required.

Data analysis

Data were described in terms of range; mean \pm standard deviation (\pm SD), frequencies (number of cases) and relative frequencies (percentages) as appropriate. For comparing categorical data, Chi square (χ^2) test was performed and fisher exact test was used when the expected frequency is less than 5. A probability value (p value) less than 0.05 was considered statistically significant. All statistical calculations were done using (Statistical package for the social science) SPSS 21 version (SPSS Inc., Chicago, IL, USA) statistical program for Microsoft windows.

Sampling technique

We have used systemic sampling in which we chosen every 3rd patient diagnosed with dengue in hospital.

RESULTS

Out of total 56 patients 22 patients (39.3%) were females and 34 patients (60.7%) were males (Figure 2). Mean age group was 36.96 years (15 to 65 years). Maximum number of cases was found in age group of 25-45 (Figure 1).

Mean time of presentation was 6th day of the fever. Out of 56 patients 40 cases (71.4%) were presented with fever, 27 cases weakness (48%), 23 cases (41.1%) headache, 21 cases were skin rash (37.5%) vomiting were 9 cases (16.1%) (Figure 3). Out of 56 patients 50 patients (89.3%) had ocular findings (Figure 4). Anterior ocular findings: subconjunctival hemorrhages 26 cases (46.4%) (Figure 10), blurring of vision 22 cases (44%), conjunctival chemosis 10 cases (17.9%), scleritis 13 cases (23.2%), anterior uveitis 9 cases (16.1%), posterior uveitis 3 cases (5.4%).

Posterior ocular findings (Figure 5): out of 56 patients 48 cases (85.7%) were having retinopathy in which optic disc pallor-18 cases (32.1%), disc margins-11 cases (19.6), tortuous vessels-20 cases (35.7%) (Figure 9), retinal hemorrhages-15 cases (26.8%) (Figure 8), retinal vasculitis-12 cases (21.4%), hard exudates-10 cases (17.9%) (Figure 8), cotton wool spots-9 cases (16.1%) (Figure 8). Among all ocular findings subconjunctival hemorrhages (Figure 10), retinal hemorrhages, cotton wool spots were more observed findings.

In laboratory parameters, NS1 IgM-39 cases (69.6%) were positive. NS1 Ig G-26 cases (46.4%) were positive. Mean hemoglobin was 8.97%. Thrombocytopenia was categorized according to platelet counts in four groups ranging less than 20 k to more than 80 k. Group of 20-50 k platelet was having 17 cases (30.4%) positive. Group of less than 20 k platelet count was comprising 16 cases (28.6%), group of >80 k platelet was containing 14 cases (25%), group of 50-80 k platelet was having 9 cases (16.1%) (Figure 6). Mean platelet count was 54.64 k. In our series all patients were NS1 positive (100%).

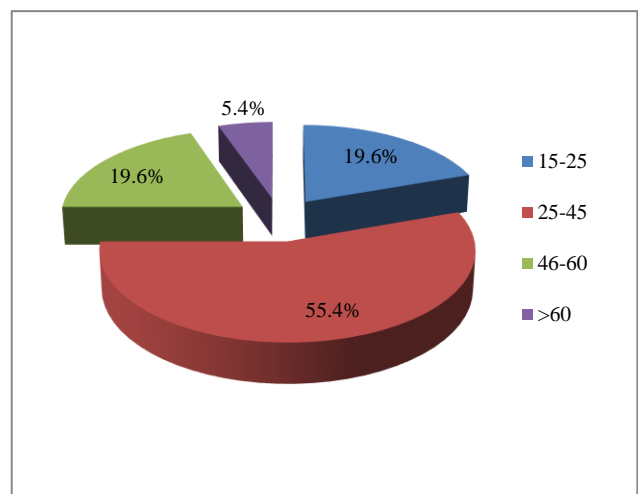


Figure 1: Age distribution.

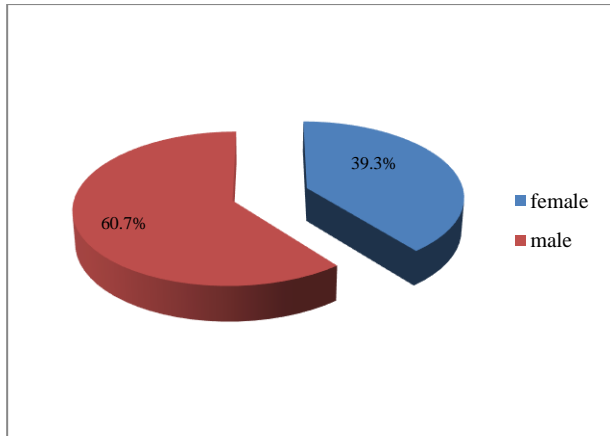


Figure 2: Gender distribution.

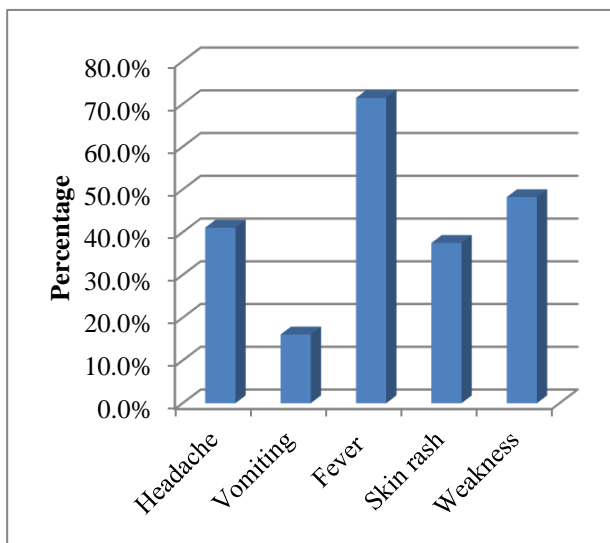


Figure 3: Systemic complaints.

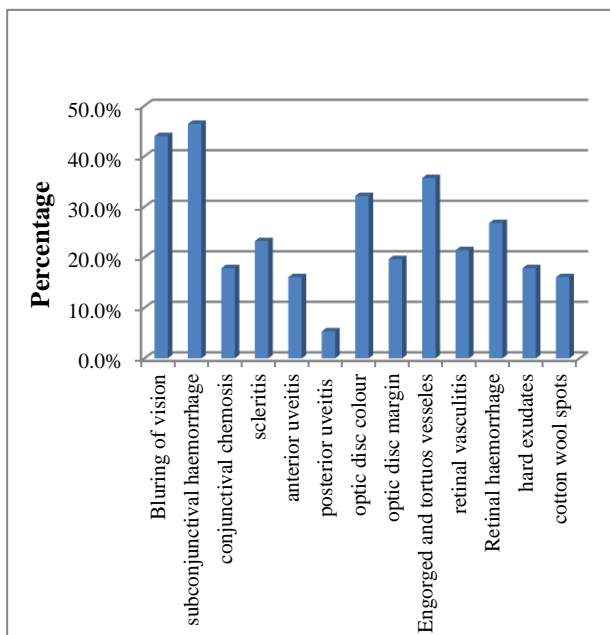


Figure 4: Ocular changes.

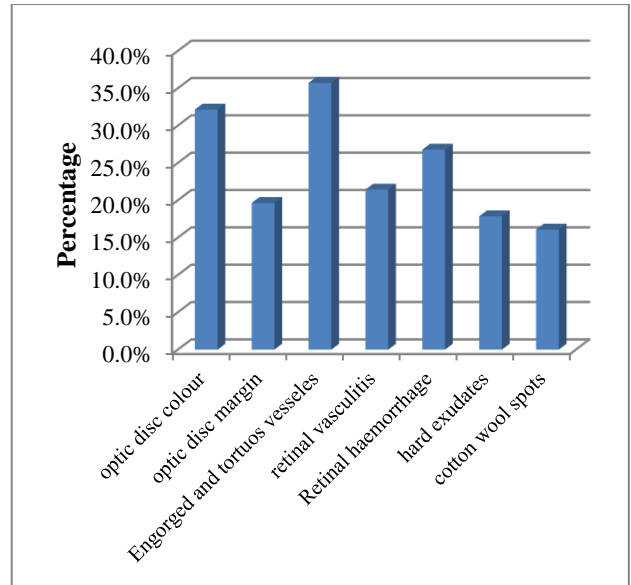


Figure 5: Retinopathy.

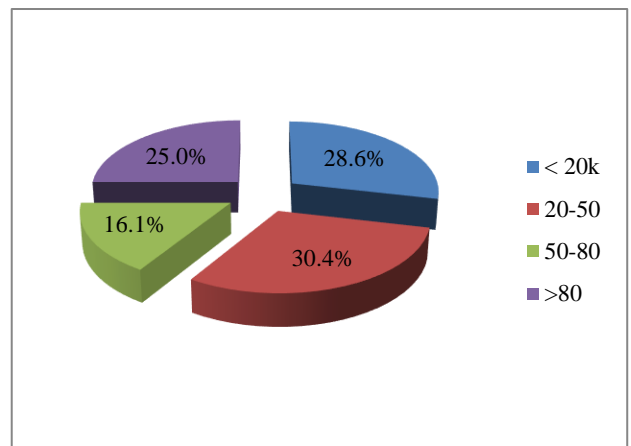


Figure 6: Thrombocytopenia.

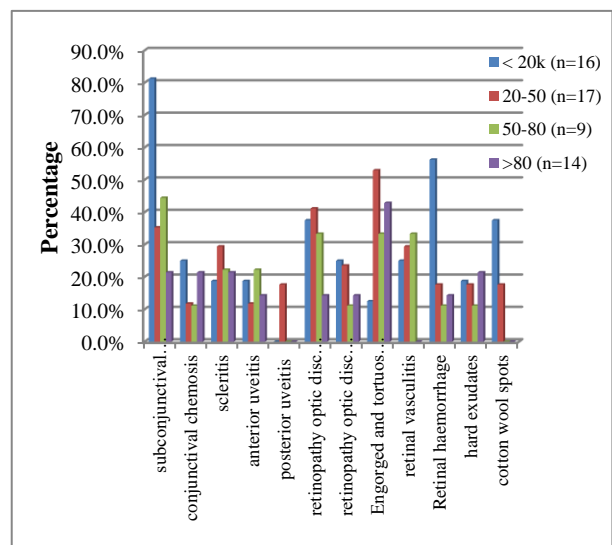


Figure 7: Platelet count and correlation with ocular manifestations.



Figure 8: Retinal haemorrhages, hard exudates, cotton wool spots.

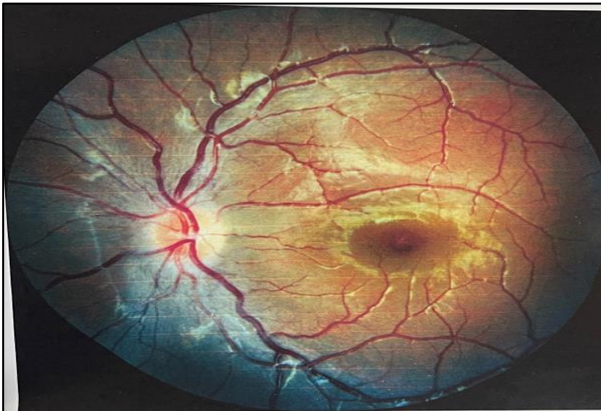


Figure 9: Engorged and tortuous vessels.



Figure 10: Subconjunctival haemorrhage.

DISCUSSION

In our study, we found the mean age of presentation was 36.96 years with male preponderance which is quite similar to other studies.^{4,6} Mean time of presentation was day 6 (3-12) of fever which was similar to other studies.^{5,9,11} Total 89.3% patients had ocular manifestations which was twice higher than the study done by Prabha et al.⁴ The most common anterior segment finding was subconjunctival haemorrhage-26 cases (46.4%) which is

almost similar to studies done by Prabha et al.^{4,9} In our study, posterior segment finding was engorged and tortuous vessels-20 cases (35.7%).

A strong association of thrombocytopenia and ocular manifestations was found and the results were comparable with other studies (Figure 7).

As the platelet count decreases subconjunctival hemorrhages increases by 50% and the result is significant at 1% level of significance with $p=0.007$.

As the platelet count decreases retinal hemorrhages increases by 60% and the result is significant at 5% level of significance with $p=0.018$.

As the platelet count decreases cotton wool spot increases by 66.7% and the result is significant at 5% level of significance with $p=0.02$.

The rest of other ocular changes did not show significant association with reduced platelet counts.

Limitations of our study were: firstly, number of cases in our study were small. Secondly, we took only hospitalized patients that might increase the bias. Thirdly, follow up of the patients was not carried out.

CONCLUSION

Incidence of dengue fever is increasing due to rise of global temperature, urbanization and population. The incidence of ocular morbidities is also on the rise in dengue patients. Due to the surge in severity of ocular involvement it becomes imperative that the treating physician should be aware regarding the array of ocular manifestations. Thus, timely reference of the patient to an ophthalmologist can decrease sight threatening complications.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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