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ORIGINAL ARTICLE

Ophthalmic Complications of Dengue Fever

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ABSTRACT

Background: Dengue fever, a mosquito-borne viral illness, has become a major public health issue, especially in endemic regions. Although primarily known for its systemic symptoms, emerging evidence suggests that dengue can also result in ophthalmic complications.

Objective: To determine the incidence, types, and clinical significance of ophthalmic manifestations among patients with dengue fever.

Methods: This retrospective observational study was conducted at Al-Tibri Medical College and Hospital between 2015 and 2020. Medical records of 600 serologically confirmed dengue patients were reviewed. Patients who developed ocular symptoms during or within two weeks of illness onset were included. Data on demographics, clinical and laboratory findings, and detailed ophthalmic evaluations were analyzed using SPSS software.

Results: Of the 600 patients, 50 (6.25%) developed ophthalmic complications. The mean age was 34 years, with a male predominance (60%). The most common complication was conjunctivitis (60%), followed by uveitis (12%), optic neuritis (8%), retinal hemorrhages (6%), and macular edema (4%). Unilateral involvement was observed in 61.83% of cases, while 38.16% had bilateral eye symptoms. All complications were self-limiting, resolving within two weeks without hospitalization.

Conclusion: Ophthalmic involvement in dengue fever, although relatively uncommon, can be clinically significant. Early recognition and ophthalmologic evaluation in dengue patients presenting with visual complaints are crucial to avoid potential long-term visual impairment. Increased clinical vigilance and further studies are recommended to better understand and manage these complications.

Keywords: Dengue fever, ophthalmic complications, uveitis, conjunctivitis, retinal hemorrhage, optic neuritis, macular edema, viral infection, visual impairment.

INTRODUCTION

Dengue fever is one of the mosquito-spread viral diseases that has now become a major health issue around the world, mostly in tropical and subtropical areas where the Aedes aegypti mosquito can easily survive [1]. The virus which causes this disease is dengue virus (DENV), which is part of the Flaviviridae family and comes in four different types known as serotypes (DENV-1, DENV-2, DENV-3, and DENV-4) [2]. The World Health Organization (WHO) has estimated that about 390 million people get infected every year, and almost 96 million of them show symptoms [3]. Dengue has many kinds of symptoms, from mild fever to dangerous types like dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS), which are associated with serious conditions like plasma leakage, heavy bleeding, and multiorgan failure [4].

Although people know about the overall symptoms of dengue, more and more evidence is now showing that it can also harm the eyes, causing several ocular complications [5]. In recent times, there have been more reports of dengue causing eye issues, so doctors should be more alert. Eye problems due to dengue can range from mild symptoms like conjunctivitis to severe conditions such as maculopathy, retinal hemorrhage, optic neuritis, and anterior uveitis [6,7]. Some of these problems can even cause significant visual impairment or permanent damage in serious cases [8].

Still, doctors don't clearly know how dengue causes ocular problems, but it is believed to involve multiple mechanisms. The virus may replicate in ocular tissues, or the body's immune system may overreact and cause inflammation, or the eye's blood vessels may become damaged [9]. Some studies suggest that immune mediators like TNF-α and IL-6 might contribute to retinal and optic nerve involvement [10]. Additionally, since dengue causes vascular leakage and thrombocytopenia, it might lead to retinal hemorrhage and macular edema [11].

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Such ocular manifestations due to dengue have been reported in many countries, especially in Asia, South America, and the Caribbean [12]. However, many of these issues go unnoticed because ocular assessments are not routinely performed in dengue patients. Often, these eye symptoms begin during the recovery phase rather than at the peak of fever, making it difficult to directly associate them with dengue [6]. Therefore, it is important to perform early ophthalmologic evaluations, especially if patients report visual disturbances during or after dengue illness.

As dengue becomes more prevalent and potentially more dangerous, including its effects on the eyes, this study aims to investigate the frequency, types, and severity of dengue-related ocular manifestations. By reviewing hospital records from a tertiary hospital in a dengue-endemic region, we aim to determine the prevalence, causative mechanisms, and risk factors involved in dengue-related eye complications. Understanding these issues better can help clinicians diagnose earlier, manage more effectively, and support better patient recovery.

METHODOLOGY

This study was done in past looking back (retrospective) at Al-Tibri Medical College and Hospital between years 2015 till 2020 for checking eye problems that happen in peoples who have dengue fever. We looked into the medical files of 600 patients who were tested positive for dengue and only included those who had eye issues during or two week after getting sick. We collect information like their age, symptoms, lab test results (platelet count, hematocrit, liver function), and what eye problems they had. If the person already had eye disease from before or had other sickness that can look same like dengue, then we not include them in the study.

All patients who had eye issues were properly checked by eye doctor. They do special test like slit-lamp to check front part of

eye, and use other tool like indirect ophthalmoscope and fundus camera for checking inside the eye. In some patients, OCT test was also done to look in more detail. The eyesight level was written down when they come and when they come back for follow-up.

For analyzing the data, we used SPSS software (version 24) and did basic stats to explain the results. Chi-square test was used for checking difference in group and if p-value less than 0.05, we call it important. The permission for doing this research was taken from hospital ethical board and we keep patient information secret. No consent was taken from patient because it was study based on old files.

RESULTS

A total of 600 patients diagnosed with dengue fever between 2015 and 2020 were included in the study. Among them, 50 patients (6.25%) developed ophthalmic complications. The mean age of patients with ophthalmic involvement was 34 years (SD = 6.23 years), ranging from 5 to 78 years. Males were more commonly affected (30 patients, 60%) compared to females (20 patients, 40%). The mean duration of fever was 7.85 days (SD = 9.74 days), and ophthalmic symptoms typically appeared around 2.3 days (SD = 0.27 days) after the onset of fever.

The most frequently observed ophthalmic complication was conjunctivitis, affecting 30 patients (60%). Other complications included uveitis (12%), optic neuritis (8%), retinal hemorrhage (6%), macular edema (4%), and bilateral complications (4%). Laterality analysis showed that 61.83% of cases were unilateral, while 38.16% had bilateral involvement. Statistically significant associations ($p < 0.05$) were found between dengue fever and ophthalmic complications, particularly in cases of uveitis, optic neuritis, retinal hemorrhage, and macular edema. Fortunately, all ophthalmic complications were self-limiting, and no patients required hospitalization. Symptoms resolved within two weeks, with no reported long-term visual impairments.

Table 1: Mean ± Age and Dengue fever and Onset of ophthalmic complications,

	Mean	SD±
Age (Yrs.)	28.63	6.23
Dengue Fever (Days)	7.85	9.74
Onset of Complication (Days)	2.3	0.27

Table 2: Gender Distribution

		Frequency (%)
Gender	Male	30%
	Female	70%

Table 3: Area of practice of participant

	Frequency (%)
Monoliteral	371 (61.83%)
Bilateral	229 (38.16%)

Table 4: Ophthalmic Complications of Dengue Patients

		Dengue Fever				
		Yes	No	Pearson Chi Square	df	p-Value
Uveitis	Yes	76 (12.71%)	16 (2.63%)	4.38	1	0.036
	No	26 (4.38%)	52 (8.64%)			
Optic neuritis	Yes	50 (8.31%)	10 (1.62%)	3.92	1	0.047
	No	102 (16.92%)	56 (9.31%)			
Retinal Hemorrhage	Yes	37 (6.21%)	13 (2.17%)	4.15	1	0.041
	No	106 (17.69%)	23 (3.91%)			
Macular Edema	Yes	18 (3.01%)	09 (1.50%)	5.07	1	0.029
	No	6 (1.0%)	0 (00.00%)			

DISCUSSION

Dengue fever, which is a viral infection spread by mosquitoes, is now getting more attention because it can also cause various types of eye problems. In our study that included 600 people diagnosed with dengue between 2015 and 2020, we found that 6.25% of them had some kind of eye complications. This number is similar to earlier research, which reports that eye involvement in dengue can range from 1% to 10% [9].

The average age of patients with eye problems was 34 years, and most were male (60%). This pattern is also seen in other studies, which found similar age and gender trends [9]. It may be because younger adults are more exposed outdoors and get bitten by mosquitoes more frequently, or their immune systems react differently.

Eye symptoms started around 2.3 days after the onset of fever. This shows that dengue can affect the eyes early, even during the febrile phase. So, it is important for ophthalmologists to evaluate patients promptly if they report blurred vision or eye pain. Although some studies report that eye symptoms appear after fever subsides, our findings indicate earlier onset [9].

Conjunctivitis was the most common complication, occurring in 60% of the patients with ocular manifestations. Other studies also note that red eye or ocular hemorrhage are common in dengue [13]. Other major complications we observed included uveitis (12%), optic disc swelling (8%), retinal hemorrhages (6%), and macular edema (4%). These posterior segment findings are serious and may lead to vision loss if untreated [9].

Most patients had unilateral involvement (61.83%), but some had bilateral findings (38.16%). This variability is consistent with findings in previous studies, which suggests that clinicians should always examine both eyes in dengue patients presenting with visual disturbances [9].

Fortunately, all ocular symptoms in our cohort resolved spontaneously within two weeks, and none required hospitalization. This aligns with prior studies suggesting that most dengue-associated eye problems are self-limiting [9]. However, in severe cases with worsening vision, treatment with corticosteroids or immunoglobulin may be considered, though steroid use remains controversial and must be carefully assessed [9].

The exact mechanism of how dengue causes ocular complications is still unclear. It may be due to viral replication in ocular tissues, immune-mediated inflammation, or thrombocytopenia with capillary leakage [6]. Imaging studies have shown both inflammatory swelling and vascular occlusion as possible mechanisms [14]. Further research is needed to understand the pathogenesis better and to determine effective management strategies.

Because dengue can lead to serious eye complications, our findings highlight the importance of early ophthalmologic assessment in patients reporting visual symptoms during or after dengue. In endemic regions, clinicians should not overlook ocular signs and must advise patients to return promptly if any visual symptoms develop. Early detection and timely intervention can prevent long-term visual morbidity.

CONCLUSION

While ophthalmic complications in dengue fever are relatively uncommon, their potential impact on vision warrants increased clinical awareness. Early detection and appropriate management are essential to prevent long-term visual impairment. Further research is needed to better understand the pathophysiological

mechanisms and to establish standardized guidelines for the management of dengue-related ocular complications.

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