

Bilateral optic neuritis with maculopathy: A rare manifestation of dengue fever

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Abstract

Dengue fever is a common mosquito-borne disease, which is endemic in tropical and subtropical countries. Bilateral optic neuropathy is a relatively unusual dengue-related ocular complication. Here, we present a case of bilateral optic neuritis with maculopathy complicating dengue infection.

Introduction

Dengue fever is a mosquito-borne disease caused by *Flaviviridae* virus and transmitted by *Aedes* mosquitoes. There are four antigenically related serotypes of dengue viruses (DEN-1 to DEN-4) with a broad range of clinical manifestations. It is endemic in Malaysia with reported cases increasing every year.¹ The prevalence of dengue-related ocular complications is relatively uncommon despite the increasing number of reports describing a myriad of dengue-related ocular signs and symptoms.²⁻⁵ These manifestations included subconjunctival haemorrhage, uveitis, maculopathy, foveolitis and optic neuropathy.⁶ Here, we report a case of bilateral optic neuritis with maculopathy complicating dengue infection.

Case description

A 38-year-old woman presented with fever associated with headaches, retro-orbital pain, myalgia and arthralgia for 3 days duration. She also felt nauseated and oral intake was inadequate but there was no vomiting. She had no significant past medical history and no recent history of travel.

Upon arrival, her clinical parameters were stable. She was well perfused with a capillary filling time of less than 2 seconds and a good pulse volume. Examination of the abdomen, cardiovascular, neurological and respiratory systems were unremarkable.

Initial laboratory investigations showed a normal haemoglobin level with a haematocrit of 44%, leucopenia ($3.2 \times 10^9/L$) and platelet

count of $170 \times 10^9/L$. Dengue non-structural protein-1 (NS-1) antigen was positive. Otherwise, her renal profile and liver function were within the normal range. She was treated for dengue fever in a critical phase and managed accordingly.

On her 4th day of hospitalisation, she complained of sudden onset of blurring of vision of the right eye. Examination of the eyes revealed regular pupils with reduced visual acuity of the right eye (6/60) while her left eye visual acuity was 6/6. Her relative afferent pupillary defect was positive over the right eye. Anterior segment examination was unremarkable in both eyes. Fundus examination revealed hyperaemic optic disc with splinter haemorrhage of both eyes and blurring of the disc margins, which was more marked over the right eye. (Figure 1A, B). Macular oedema was noted over the right eye (Figure 1A).

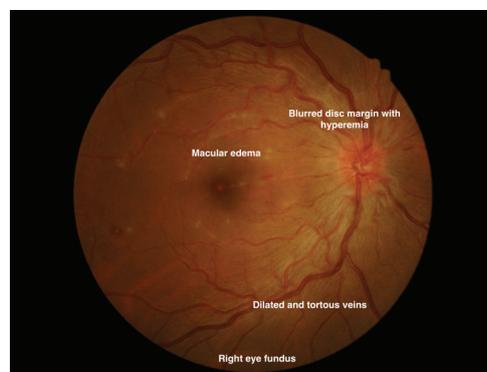


Figure 1A. Right eye fundus examination showed the presence of blurred disc margin with hyperaemia and macular oedema

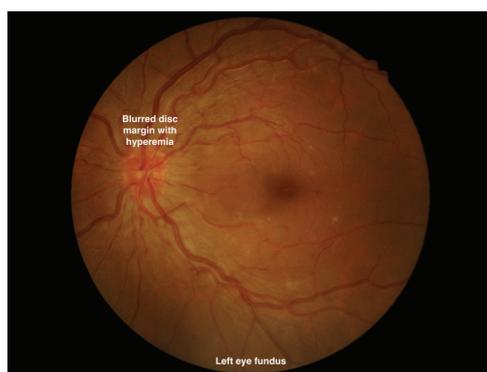


Figure 1B. Left eye fundus examination showed the presence of blurred disc margin with hyperaemia

She was diagnosed with bilateral optic neuritis with right eye macular oedema and foveolitis. Her nadir platelet count was $81,000 \times 10^9/L$, and this coincided with her ocular symptoms. She was started on intravenous methylprednisolone 1 g daily for 3 days and continued with oral prednisolone in a tapering dose upon discharge. Her visual acuity improved to 6/9 over the right eye, and fundoscopic examination revealed that the macular oedema had resolved with marked improvement over the optic disc region bilaterally. At 1 month follow-up, there was no deterioration in the visual acuity of both eyes and we managed to taper off the steroid therapy. (Figure 2).



Figure 2. Fundi of both eyes after steroid therapy

Discussion

Dengue infection is a global public health problem with increasing prevalence.¹ Dengue-related ophthalmic manifestation is uncommon and ranges from subconjunctival haemorrhages to optic neuropathy. The mechanism leading to ocular involvement in dengue infection is unknown, but may be attributed to an immune-mediated process and possibly its infectious aetiology.⁷ The presence of haemorrhages such as subconjunctival haemorrhage, vitreous haemorrhages and retinal haemorrhages may be attributed to thrombocytopenia with coagulation defects, capillary fragility, consumptive coagulopathy and platelet dysfunction.⁸ Fortunately, most of these dengue-related ocular manifestations eventually resolved with the recovery of platelet counts.⁹

The onsets of visual symptoms were closely correlated with the nadir of platelet level during the dengue infection.⁷ Most cases presented with visual symptoms within a day of their lowest platelet count while a minority presented a day after the nadir thrombocytopenia.⁷ In our case, the visual symptoms developed during the nadir, and this was consistent with previously reported cases. Of all the visual symptoms, blurring of vision is the most common presenting complaint in dengue-associated ophthalmic manifestation and this is closely related to the presence of maculopathy.⁶ Other possible symptoms include scotoma and ocular pain.⁶ Our patient presented with sudden onset of blurring of vision over the right eye that was painless and progressively worsening. The presence of macular oedema explained the visual disturbance as the visual acuity of her left eye, which had no maculopathy, was spared.

Optic neuropathy is relatively uncommon compared to other dengue-related ocular manifestations. Hyperaemia, optic disc swelling and disc haemorrhages are common presentations of dengue-related optical neuropathy.⁶ As the development of optic neuropathy is likely to be immune-mediated, treatment with steroid was justified.⁶ Steroid therapy is recommended only for those with persistent symptoms or poor vision. Most dengue-related ocular disease are self-limiting and resolve spontaneously. The medical literature has reported on the use of steroid therapy and its favourable outcome.^{6,7,10} Our patient was started on steroid therapy due to worsening visual acuity and the presence of optic neuropathy. There was marked improvement of symptoms after initiation of treatment.

The overall prognosis for dengue-related ocular complications is good. Despite that, a significant number of patients may experience residual visual disturbance including persistent central scotoma and poor vision.⁶ Rarely, visual recovery is poor despite steroid therapy.

Conclusion

Dengue fever can result in a broad spectrum of ocular complications. Bilateral optic neuritis, although rare, can occur in association with dengue infection. Early treatment with steroid is beneficial and may improve the visual outcome.

A take-home message for primary care physician

- Dengue fever may lead to a variety of ocular complications.

- Timely referral of dengue patients with ocular complications (e.g., optic neuritis) to secondary and tertiary centres may prevent long-term disability and improve the visual outcome.

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None declared.

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