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Case Report

Lateral rectus palsy in a case of dengue fever

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manifestations ranging from mild non-specific symptoms to severe retinal hemorrhages, are being regularly reported.^{3,4}

However, abducens nerve involvement, manifesting with lateral rectus paralysis following dengue is so rare that it has only been reported once, earlier in literature.⁵

Case report

A 52 year old male patient was transferred to this centre as a case of dengue fever. The patient gave a history of fever for the past 5 days, and since he was located at a dengue endemic area, he had already been investigated with dengue IgM antibodies capture enzyme-linked immunosorbent assay (MAC-ELISA) test which had confirmed the diagnosis. On admission, his pulse was 96/min regular and low volume and blood pressure was 106/70 mm of Hg with no significant postural fall. Temperature was 100.2 degree F and his respiratory rate was 18/min. His blood sugar random was 110 g/dl. Hemogram revealed a total leukocyte count of 4000/mm³ with 42% lymphocytes, hemoglobin 16.1 g/dl, PCV 48%, platelet count of 78,000/mm³ and elevated liver transaminases – ALT 96 U/l and AST 84 U/l. His renal functions were normal. The platelet count subsequently dropped to a nadir of 25,000/mm³ on the 6th day of fever (2nd day of admission) before convalescence. However the patient did not develop any clinical features of significant plasma leakage, shock or bleeding. The chest radiograph was normal. He was managed with intravenous fluids according to 2009 WHO dengue guidelines. Initially the patient had no ocular complaints however 3 days after admission he started complaining of binocular diplopia which worsened on left gaze.

Introduction

Dengue fever is the most prevalent form of flavivirus infection in humans. Borne by the *Aedes* mosquito, the infection is endemic in more than 100 countries mostly in the developing world and those around the tropics and the warm temperate regions of the world. The highest incidence occurs in South-east Asia, India, and the American tropics. Worldwide more than 100 million people are infected annually.¹

Recent studies indicate that the clinical profile of dengue is changing, and that neurological manifestations are now being reported more frequently, though their exact incidence is uncertain.²

Ocular findings in dengue fever were also considered rare previously. However now, a wide spectrum of ocular

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Ocular examination revealed a convergent squint in the left eye (Fig. 1). The ocular movements were also restricted in the extreme lateral gaze, in the left eye (Figs. 2 and 3) (Table 1). The rest of the anterior and posterior segments including the vision as well as the fundus, of both the eyes were normal. The patient was investigated with an MRI brain, to rule out any compressive mass lesion and it too was normal. He was further investigated with optical coherence tomography (OCT), fundus fluorescein angiography (FFA), and visual field analysis (VFA) to detect any other ophthalmic manifestations of dengue fever, however they too were normal. Hess screen testing confirmed left lateral rectus palsy.

The patient gradually improved and became afebrile on the 7th day post admission. His platelet counts too rose to normal levels. His complaints of diplopia though lesser, however still persisted. The patient was sent on 4 weeks sick leave. Ophthalmic examination after sick leave revealed the lateral rectus palsy to be totally resolved with no symptoms of diplopia.

Discussion

Dengue is the most important disease caused by an arbovirus (1, 2, 3 and 4 serotypes) worldwide. It is specially prevalent in the tropical and sub-tropical regions, with clinical manifestations ranging from asymptomatic infection to severe life threatening disease characterized by hemorrhage and shock.⁶

Among the neurological sequelae mononeuropathy, encephalopathy, transverse myelitis, polyradiculopathy, Guillain–Barre syndrome, optic neuropathy and oculomotor neuropathy have been reported in literature, with encephalopathy being by far the most commonly seen.⁵ The pathogenesis of neurological manifestations is multiple and includes: neurotrophic effect of the dengue virus, related to the systemic effects of dengue infection, and immune mediated.²

Ophthalmologically, dengue mainly affects the posterior segment of the eye, with a range of hemorrhagic and inflammatory sequelae. Reported ocular manifestations include

Fig. 2 – Ocular movements restricted in extreme lateral gaze (Left eye).

petechial hemorrhages in conjunctiva (commonest), anterior uveitis, vitreous hemorrhage, choroidal effusions, intra retinal hemorrhages, vitreous hemorrhage, Roth spots, cotton-wool spots, retinal edema, blurring of the optic disk and maculopathy. Platelet counts less than 50,000/ μ L have been seen to predispose to ocular hemorrhages.³

The most common visual complaints are blurring of vision seen in 51% of cases and central scotoma seen in 34% of cases, in one large scale study.⁷ The onset of visual symptoms usually occurs on or close to the day of the lowest serum platelet level. Ocular alterations in dengue are usually self-limiting with most of the findings resolving without specific treatment. Visual recovery, in the form of improvement of signs and symptoms, usually corresponds to improving platelet levels but may take several weeks to reach normal levels.¹

In our case too, initially the patient had no ophthalmological complaints, however 2 days after admission he started complaining of diplopia, which coincided with a fall in his

Fig. 1 – Convergent squint left eye.

Fig. 3 – Ocular movements full and free on medial gaze (Both eyes).

Table 1 – Diplopia charting.

UP							
LEFT	I	15"	I	10"	I	15"	RIGHT
	I	16"	I	10"	I	15"	
	I	17"	I	19"	I	15"	
DOWN							
In the nine positions of gaze							

platelet count to 25,000/mm³. He underwent an MRI initially to rule out any compressive mass lesion in the brain. Subsequently he was investigated ophthalmologically with an FFA and OCT. These investigations are useful in detecting macular edema and occult vascular changes, which may be missed on clinical examination alone, and in presence of minimal functional disturbances.^{2,7,8} These investigations as well as the VFA done subsequently were all normal. Hess screen charting however confirmed lateral rectus palsy left eye.

By the 6th day of admission, the patients' fever as well as platelet counts became normal and his symptom of diplopia too improved significantly. Review after another four weeks revealed the lateral rectus palsy to have totally resolved with no residual diplopia.

A similar complete recovery was also recorded in the only other similar case ever mentioned in literature.⁵

Though no nerve conduction studies were carried out in our case, however earlier studies have shown that mononeuropathies following dengue are associated with demyelinating type of conduction defects with axonal components.⁹ This perhaps was the pathogenesis in our case too.

Conclusion

Though optic neuropathy and oculomotor nerve palsy,¹⁰ following dengue fever have been reported in literature a few times previously, however abducens nerve palsy has only been reported of once earlier. Here we have described the 2nd ever reported case of abducens nerve palsy complicating dengue fever in a previously healthy male. We recommend that in a tropical country like ours with endemic dengue infection, dengue related abducens neuropathy may be

considered as a differential diagnosis in cases of acquired lateral rectus palsy.⁵

Since ocular abnormalities are now being commonly encountered in patients with dengue fever, we also recommend that a dilated fundoscopy should be performed as a routine in all patients presenting with severe forms of the disease.¹¹

Conflicts of interest

All authors have none to declare.

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