

Bilateral Abducens Nerve Paresis: A Rare Manifestation of Dengue Fever

PRAGATI GARG¹, SWARASTRA P SINGH², ARCHANA VERMA³, ABHAY SINGH⁴, VINOTH GNANA CHELLAIYAN⁵

ABSTRACT

Dengue fever is endemic in over 100 countries, with the majority of cases reported in the World Health Organisation (WHO) regions of the Americas, Southeast Asia and the Western Pacific. Dengue fever is endemic in almost every state in India, and it is the leading cause of hospitalisation. The presentation may vary from being asymptomatic to having mild syndrome. Among other neuro-ophthalmological manifestations, oculomotor neuropathy, optic neuropathy and unilateral abducens nerve palsy has been reported but to the best of authors' knowledge this is the first reported case of dengue virus related type three internuclear ophthalmoplegia. A 47-year-old male patient presented with complaints of fever on and off for the last three days along with speech defects. At admission his blood pressure was 120/86 mmHg, pulse rate was 96 per minute. Oxygen saturation (SpO₂) was 94%. He was thoroughly investigated for various viral and bacterial infections, none of which was detected in Polymerase Chain Reaction (PCR) serum test. Hepatitis B virus surface antigen (HBsAg), antibody against Hepatitis C Virus (anti-HCV), antibody against Human Immunodeficiency Virus type 1/2 (anti-HIV 1/2) were all negative. Anti-dengue virus Immunoglobulin M (IgM) antibody was found to be positive. The patient complained of double vision and on examination diplopia in both lateral gaze with maximum separation of images in right gaze. Due to the wider range of possible presentations, it is imperative to consistently follow-up with all dengue patients to check for any neurological sequelae.

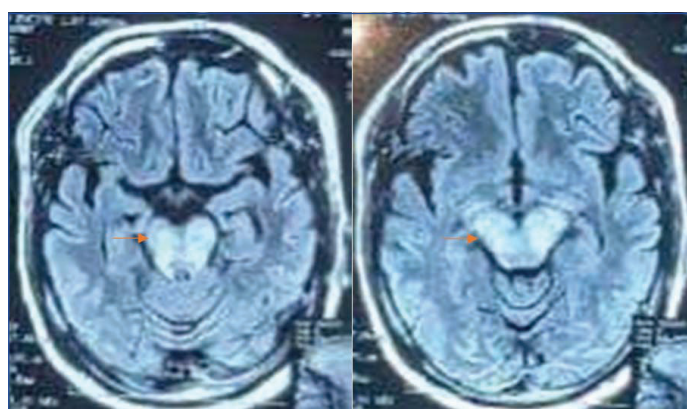
Keywords: Diplopia, Ophthalmologia, Slurred speech

CASE REPORT

A 47-year-old male patient from northern India visited a tertiary care hospital with complaints of fever on and off for the past three days along with slurring of speech defects. He was admitted and clinically evaluated. The speech was fluent, spontaneous, reduced voice volume with difficulty in word finding and naming since, two days. The patient was non diabetic, non hypertensive but gave history of hypothyroidism. He was started on medication i.e, tablet paracetamol 500 mg six hourly.

One day later he developed altered sensorium. At admission his blood pressure was 120/86 mmHg, pulse rate was 96 per minute, Oxygen saturation (SpO₂) was 94%. Chest X-ray was normal. He was thoroughly investigated for various infections like enterovirus, herpes simplex virus 1, and varicella zoster virus, none of which was detected in Polymerase Chain Reaction (PCR) serum test. Scrub typhus antibody Immunoglobulin M (IgM), japanese encephalitis virus IgM antibody IgM antibody and chikungunya virus IgM antibody virus IgM antibody were all negative. Blood sugar was within normal limits. Hepatitis B virus surface antigen (HBsAg), antibody against Hepatitis C Virus (anti-HCV), antibody against Human Immunodeficiency Virus type 1/2 (anti-HIV 1/2), were all negative. Anti-dengue virus IgM antibody came out to be positive, thus confirming the diagnosis of dengue fever. Computed tomography (CT) scan of the brain was normal. Magnetic Resonance Imaging (MRI) brain revealed Fluid Attenuated Inversion Recovery (FLAIR) and T2 hyperintensities in bilateral thalamus, midbrain, pons and upper half of medulla, which were hypointense on T1-weighted images and showed meningeal enhancement on contrast administration [Table/Fig-1]. Cerebrospinal Fluid (CSF) findings were unremarkable. The patient had no signs of bleeding or haemorrhages. As the patient had constitutional symptoms, he was managed with intravenous fluids, antiepileptics for prophylaxis, antiemetics and multivitamins. Patient was treated on conservative line depending on the symptoms.

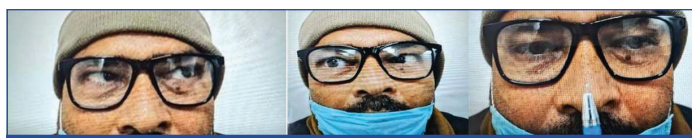
The patient was managed with intravenous (i.v.) fluids and i.v. antibiotics (ceftriaxone 1 gm i.v. 12 hourly), antiemetics (ondansetron 4 mg i.v. SOS), hyperosmotic agents (mannitol 1 g/kg over 45 minutes (20% solution) then 100 mL six hourly for three days), multivitamins



[Table/Fig-1]: T2 weighted MRI brain image showing hyperintensity involving bilateral thalamus.

and antithyroid drugs (thyroxine 100 ug/day). Patients' condition improved within 10 days. When he was discharged his Glasgow Coma Scale was E4V5M6, blood pressure 110/70 mmHg, pulse rate was 82 per minute and SpO₂ was 97%.

Approximately 20 days later from the onset of fever he complained of double vision, more so on looking to right side. On examination, his vision was 6/18 Oculus Dexter (right) and 6/12 Oculus Sinister (left), near vision was N-6 bilaterally. After refractive correction vision improved to 6/6 both eyes. Corneal reflex was central on Hirschberg test. However, two days later he complained of double vision on looking on left side also. Diplopia charting showed double vision in both lateral gaze with maximum separation of images in right gaze. Nystagmus was not present. A provisional diagnosis of bilateral abducent nerve palsy was made. Nerve conduction and electromyography was not performed. On examination, restricted movement was present on abduction of each eye but it was still more on looking to the right side. Adduction was good in both eyes but convergence was poor [Table/Fig-2]. His vision was still the same as before. All other eye movements, both ocular fundus and colour perception were unremarkable. The patient was followed-up every two weeks for the next three months after discharge.



[Table/Fig-2]: Restricted abduction of right eye- convergence deficiency.

DISCUSSION

Dengue fever is a global public health problem and is having regular outbreaks in India. Dengue fever has three stages: febrile, critical and recovery. A sudden high grade fever of around 40°C occurs during the febrile phase, which usually lasts two to seven days [1,2]. Facial flushing, skin erythema, myalgias, arthralgias, headache, sore throat, conjunctival injection, anorexia, nausea and vomiting are all common symptoms. A rapid drop in platelet count, a rise in haematocrit (the patient may have leucopenia up to 24 hours before platelet count drops), and the presence of warning signs characterise the critical phase [3]. Shock, organ dysfunction, disseminated intravascular coagulation and haemorrhage are all possible outcomes. In the recovery phase, extravascular fluid is gradually reabsorbed over two to three days. Clinical manifestations ranges from being asymptomatic to severe life threatening disease [4,5].

Effective clinical evaluation and laboratory testing helps in recognising the warning signs and thus helps in giving appropriate prevention and treatment. Occasionally rare complications of dengue infection are encountered. The atypical manifestations in dengue fever are multi systemic and multifaceted with organ involvement such as liver, brain, heart, kidney and central nervous system [6]. Although, neuro-ophthalmological complications following dengue fever are rare but ocular involvement can occur in 40% of dengue patients [7,8]. Both anterior and posterior segment can be involved presenting as subconjunctival haemorrhage, uveitis, maculopathy, optic neuropathy, retinal edema, optic disc swelling, vitreous haemorrhage, retinal haemorrhage or vitritis [9,10]. Very few authors have reported abducent nerve palsy [11]. There is no precedent in literature of bilateral abducent nerve palsy or paresis following dengue infection. The time period from the start of fever to the onset of ocular symptoms corresponds to the production of antibodies and deposition of immune complexes, hence confirming the pathogenesis to be immune related but the exact mechanism is not completely understood. Although, researchers postulates that the neuro-ophthalmic complications could be because of vasculitis, capillary leakage, metabolic imbalances, autoimmune reaction or direct invasion of dengue virus into the central nervous system [12].

The present case presented approximately 20 days after fever with complaints of double vision first on looking to right-side and subsequently two days later on looking to left side too. On examination there was restricted abduction in both eyes. However,

in primary gaze he was orthophoric on Hirschberg test. The Hirschberg test (also called the corneal light reflex test) is a quick and easy way to determine ocular alignment. This test is especially useful for detecting strabismus (eye misalignment) in newborns, small children, patients with poor vision, patients who can not fixate or track well or in any situation where a full motility evaluation is not possible. The patient showed convergence deficiency although both eyes were able to abduct individually. There seems to be immune effect on the two-sixth nerve nucleus and also the convergence center. For treatment of ophthalmic complications of dengue fever no definite protocol is present except the supportive treatment although several authors have used high dose steroids considering it to be immune mediated. Overall prognosis of dengue related ophthalmic problems is good and almost always complete recovery takes place [13].

CONCLUSION(S)

Bilateral abducent nerve palsy in dengue infection is a rare manifestation. The diagnosis of bilateral abducent nerve paralysis could be arrived with complete ophthalmological examination and by ruling out neurological causes with imaging and other investigations. As the spectrum of presentation is wider, all the dengue patients need to be followed-up invariably for monitoring of any neurological sequelae.

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