Posterior Reversible Encephalopathy Syndrome in Dengue Fever

Sarkar S[1], Chakraborty AP[2], Roy MK[3]

Abstract

Dengue, an arthropod born disease can present with mild febrile illness to life threatening dengue haemorrhagic fever but posterior reversible encephalopathy syndrome(PRES) which usually seen in hypertensive emergencies is rare in the setting of dengue. We are presenting a case where a patient presented with dengue, developed PRES.

Introduction

Dengue is an important arthropod borne disease worldwide with 50-100 million infections occurring each year.[1] Disease caused by dengue ranges from a relatively mild febrile illness to a life-threatening condition characterised by extensive capillary leak.

Posterior Reversible Encephalopathy Syndrome (PRES) usually occurs in the setting of hypertensive emergencies, characterised by bilateral increase in T2 signal intensity in the white matter on MRI usually concentrated in the posterior part of the hemispheres. Findings are of white matter edema which normalizes over several weeks.[2]

The incidence of neurological manifestations is rare in dengue. Here we present a case of dengue fever with posterior reversible encephalopathy syndrome.

Case Report

A 68 years old non diabetic and non-hypertensive homemaker presented with history of continuous fever without chills for 5 days and altered sensorium since 2 days and one episode of generalised tonic clonic convulsions 1 day before admission. There was no history of headache, vomiting, antecedent exanthematous illness, vaccination, ear discharge, intake of drugs, no bleeding manifestations.

General survey showed the patient had tachycardia (110/min), hypotension (80/60 mmHg), high respiratory rate (34/min), elevated temperature (101.2°F), a puffy facies and poor GCS (7/15). Patient had no focal weakness, deep tendon reflexes were normal but the plantar response was bilaterally extensor. Sensory and cerebellar

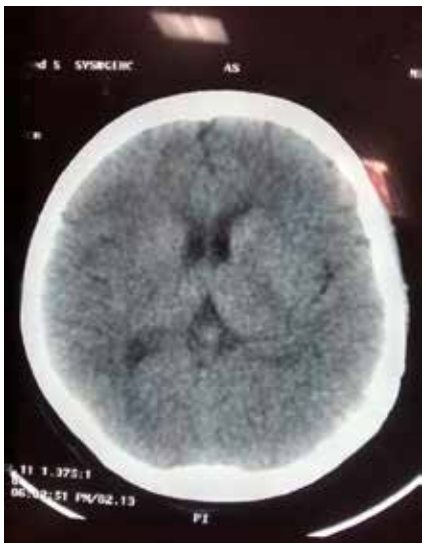

Fig. 1: NCCT brain was normal

[1]Assistant Professor, [2]Post Graduate Trainee, [3]Professor, Calcutta National Medical College and Hospital, Kolkata, West Bengal

Received: 31.03.2017; Accepted: 29.10.2018

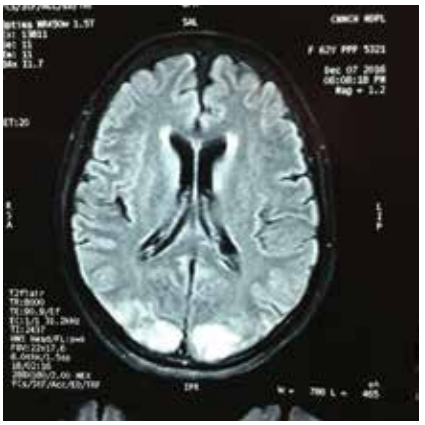

Fig. 2: MRI brain T2 flair showing bilateral occipital hyper intensities

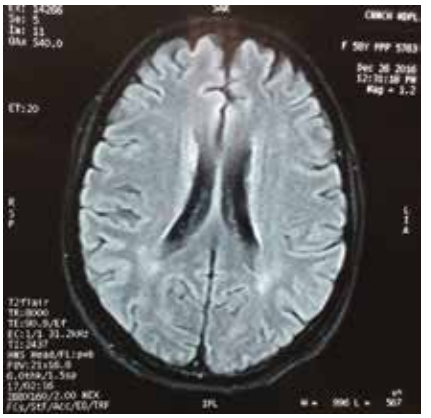

Fig. 3: Repeat MRI brain after 2 weeks, showing complete resolution of the hyper intensities

examination couldn't be done due to poor general condition of the patient. Examination of the other systems was unremarkable.

Empirical treatment was started on first day of admission with broad spectrum antibiotics with antiviral and steroid, fluid and ionotropic support, an antimalarial (IV Artesunate) and anticonvulsants. All routine investigations were sent. A CT Brain (Figure 1) was done and a CSF Study was planned.

Blood reports showed a leucocyte count of 4,300/µl, platelets - 36,000/µl, haemoglobin - 13.7 g% with no abnormal cells in peripheral smear; pre-renal azotemia (serum urea – 151 mg/dl and creatinine – 3.1 mg/dl), deranged hepatic transaminases (AST - 96 U/L, ALT - 109 U/L, ALP – 156 U/L; Se Bilirubin – 0.68 mg/dl). Malarial parasite, MPDA and HIV I and II antibodies were negative. Dengue NS1 antigen and IgM antibody came out to be positive. Chest X-ray and USG of whole abdomen were within normal limits. IgM Leptospira was also sent and report was awaited. CSF study revealed raised protein – 179 mg/dl with a cell count of 15/µl (all lymphocytes), rest being normal.

Meanwhile, patient was not showing expected improvement in sensorium even after 5 days of the above treatment. In this background we considered the possibility of Dengue encephalitis and at this stage patient was haemodynamically stable and an MRI Brain was done. It showed (Figure 2) - Multiple long TR hyper intensities in bilateral parieto-occipital cortex with subcortical white matter; no diffusion restriction, no contrast enhancement, no GRE blooming. MRI findings were consistent with Posterior Reversible Encephalopathy Syndrome (PRES).

Patient was put on supportive treatment only and showed gradual improvement in the sensorium over the next 2 days. Vital signs and general condition also improved and patient started to take food orally. Blood parameters and biochemistry gradually normalized. Blood Culture, IgM Leptospira reports came negative. ANA (by Hep2) was sent and came negative.

A repeat MRI (Figure 3) was done 2 weeks later and it showed complete resolution of the above findings.

Discussion

Despite extensive research, the pathogenesis is of dengue is poorly understood. The primary target cells for Dengue virus are dendritic cells and monocytes/macrophages that release various chemokines and cytokines upon infection, which can activate the endothelium and play a major role in Dengue virus induced vascular permeability.[3]

Pathogenesis of Posterior Reversible Encephalopathy syndrome is not fully understood but endothelial dysfunction[4] and failure of cerebral auto regulation[5] play a key role. The brain edema is the result of active exocytosis of water rather than simply a passive leak from vessels subjected to high pressures. CSF pressure and protein may be elevated to more than 100mg/dl without any cellular reaction. Strongly associated conditions like hypertensive emergency, systemic lupus erythematosus,[6] chronic kidney disease, immunosuppressive therapy, use of chemotherapeutic[7] agents like tacrolimus, cyclosporine, vincristine and interferon alpha were all excluded in our patient. This case is important as never in the course of her disease our patient had accelerated hypertension and PRES occurring in the background of Dengue Shock syndrome is probably not reported elsewhere. It points towards a possible similar pathogenesis between the two; of endothelial dysfunction which invites further research.

Conclusion

Out of the various manifestations of dengue fever posterior reversible encephalopathy syndrome can be an atypical and rare presentation.

References

1. Kuhn JH, Peters CJ. Arthropod-borne and Rodent-borne Virus Infection. In: Kasper DL, Fauci AS, Hauser SL, Longo DL, Jameson JL, Loscalzo J, editors. Harrison's principles of internal Medicine. 19th ed. Vol.2. New York: McGraw-Hill 2015.p. 1318-1319.
2. Hinchey J, Chaves C, Appignani B, et al. A reversible posterior leukoencephalopathy syndrome. *N Engl J Med* 1996; 334:494-500.
3. Vervaeke P, Vermeire K, Liekens S. Endothelial dysfunction in dengue virus pathology. *Rev Med Virol* 2015; 25:50-67.
4. Marra A, Vargas M, Striano P, Del Guercio L, Buonanno P, Servillo G. Posterior reversible encephalopathy syndrome: the endothelial hypotheses. *Med Hypotheses* 2014; 82:619-22.
5. Hobson EV, Craven I, Blank SC. Posterior Reversible Encephalopathy Syndrome: A Truly Treatable Neurologic Illness. *Perit Dial Int* 2012; 32:590–594.
6. Gatla N, Annapureddy N, Sequeira W, Jolly M. Posterior reversible encephalopathy syndrome in systemic lupus erythematosus. *J Clin Rheumatol* 2013; 19:334-40.
7. Singer S, Grommes C, Reiner AS, Rosenblum MK, DeAngelis LM. Posterior Reversible Encephalopathy Syndrome in Patients with Cancer. *Oncologist* 2015; 20:806-11.