ABSTRACT
Dengue virus is a non-neurotropic RNA virus from the Flaviviridae family. Dengue virus has been linked to neurological symptoms in a growing number of research and case reports. In our case, we looked at the magnetic resonance imaging (MRI) findings of a patient with dengue fever who had neurological symptoms and was diagnosed with dengue meningoencephalitis after testing positive for the dengue NS1 antigen. This case report emphasises the importance of considering dengue encephalitis in dengue fever patients who have neurological symptoms and appropriate imaging findings.

Key words: Meningoencephalitis; Hemorrhagic Infarct; Dengue Fever; Cerebral Edema.

INTRODUCTION
Dengue fever is caused by an RNA virus from the Flaviviridae family that is spread by Aedes mosquitoes. [1,2] Around 2.5 billion individuals are at danger, mostly in densely populated parts of tropical and subtropical countries, with an estimated yearly infection load of 50 million. According to the World Health Organization (WHO), India is under endemicity category A, which means that dengue fever is a major public health issue. Undifferentiated viral fever, dengue fever, and dengue hemorrhagic fever are among the symptoms seen in symptomatic patients. Dengue fever can present in a variety of ways, including neurological, hepatic, renal, and other discrete organ dysfunction. [1] Dengue fever is a virus that is not neurotropic. [2] However, there are a growing number of research and case reports indicating central nervous system (CNS) involvement. [3-5] Three elements are responsible for CNS manifestations: (a) neurotropic effect, (b) subsequent to systemic manifestation, and (c) postinfectious sequelae, including immunemediated reactions. [6,7] Magnetic resonance imaging (MRI) findings (MRI) of the brain have been described in several case reports and studies, with a variable spectrum of findings. [2,8-14] In this study, we have evaluated MRI brain findings of serologically proven patient of dengue with clinical suspicion of encephalitis.
CASE REPORT
A 20 year male was brought to a emergency with a complain of high grade fever and altered sensorium since 2 days with a Glasgow Coma Scale score of 6 out of 15. Patient was apparently alright 2 days back, temperature on admission was documented to be a 107ºC associated with chills. On hematological evaluation Hb was 18%, platelet count was 73000/l, TLC was 9.8 x1000 mm³, patient was positive for dengue NS1 Cerebrospinal fluid analysis revealed no cells, total protein 5.66 gm/dl, and sugar 52mg/dl with normal gram stain and culture sensitivity.

Diagnostic imaging:
Non-contrast computed tomography of head showed bilateral hypo intensities with central hyper intensities in bilateral thalami suggestive infarcts with central bleed. day after noncontract sca patient was taken for subsequently Magnetic resonance imaging (MRI) of brain which showed symmetrical T2 FLAIR (Fluid attenuated inversion recovery) hyper intensities in bilateral thalami and parietotemporal-occipital region, showing areas of diffusion restriction and foci of blooming within on SWI (Susceptibility weighted imaging) likely hemorrhagic residues characteristic of double doughnut sign. Figure 1 Diagnosis of dengue encephalitis was made; patient was successfully managed conservatively with intravenous fluids and discharged in stable condition.

DISCUSSION
Dengue virus is a Flaviviridae virus with a single stranded RNA genome. Dengue virus has four separate but closely related serotypes: DEN1, DEN2, DEN3, and DEN4. Once infected immunity lasts long time. Cross immunity to different serotypes, on the other hand, is only partial and only lasts for a short time. Other serotypes can cause severe dengue infection if they are infected later. Dengue infection caused neurological involvement for the first time in 1976. Headaches, altered sensorium, papilledema, neck rigidity, and seizures were all common symptoms. Dengue can cause encephalopathy or encephalitis, which affects the brain. Encephalitis is caused by a virus invading the brain and producing inflammation of the brain parenchyma. Focal abnormalities on imaging suggest encephalitis rather than encephalopathy. Encephalopathy is frequently caused by a combination of factors, including encephalitis, hepatic failure, shock, coagulopathy, and bacterial infections. It manifests as diffuse brain involvement with no specific imaging findings. 6,12 Our case described findings that were similar to those published in other case reports and investigations. 2,5,9,11,12 T2 and
FLAIR hyperintensity in the thalamus and cerebral hemisphere, centrum semiovale, and corpus callosum were described by Bhoi et al.[2], Souren et al.[5], and Jayaseelan et al.[11]. Bhoi et al. described a restriction on diffusion that was similar to ours. Pal et al.[5] described diffuse cerebral edema in patients with comparable symptoms to ours. In his case series, Borawake et al.[9] highlighted petechial haemorrhages, which were also described in our subject. Dengue encephalitis is characterised by nonspecific MRI abnormalities, which can also be seen in Japanese and herpes encephalitis. In challenging situations, a serological test can help distinguish it from other types of viral encephalitis. Chikungunya encephalitis has clinical symptoms that are similar to dengue encephalitis. T2 weighted hyperintense white matter lesions with limited diffusion are seen in Chikungunya encephalitis. [15]

CONCLUSION
In a patient with dengue fever and neurological signs, the imaging findings may help physicians arrive at a definite diagnosis including bilateral thalamic involvement with the “double doughnut” sign and bilateral cerebellar involvement.

Declaration of patient consent
The patient consent was obtained for the above case and the images are procured after assurance of the patient that his identity will not be revealed.

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Conflicts of interest
There are no conflicts of interest.

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