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Cerebral Venous Sinus Thrombosis in a Child with Dengue Fever: A Rare Case Report

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Abstract: ***Background: Dengue fever is a prevalent arboviral infection in tropical countries, often presenting as a nonspecific febrile illness. Neurological complications, although rare, can significantly impact morbidity. Among these, cerebral venous sinus thrombosis (CVST) is a life-threatening but underrecognized entity. Case Presentation: We describe a case of an 11-year-old female who presented with classical symptoms of dengue fever, which progressed to altered mental status and visual disturbances. Her investigations showed thrombocytopenia and positive dengue serology. A detailed neurological examination shown neck stiffness and positive Kernig's sign. MRI with venogram confirmed CVST involving the superior sagittal sinus, right sigmoid, and bilateral transverse sinuses. With appropriate anticoagulation therapy and supportive care, the patient showed marked improvement. Conclusion: This case emphasizes the need for heightened clinical suspicion of CVST in pediatric dengue cases presenting with neurological symptoms. Early neuroimaging and anticoagulation can be lifesaving.***

Keywords: Dengue, Cerebral venous thrombosis, Neurological complications, Pediatric dengue, CVST, MRI venogram

Abbreviations
CVST – cerebral sinus venous thrombosis
NS1 – non specific antigen 1
MRI – magnetic resonance imaging
PT – Prothrombin Time
INR – international Normalized Ratio

1. Introduction

Dengue fever, caused by the dengue virus belonging to the Flaviviridae family, is transmitted by Aedes mosquitoes. It has become one of the most common tropical infections worldwide, particularly in India. While classical dengue manifests with high fever, myalgia, rash, and thrombocytopenia, complications such as dengue hemorrhagic fever and dengue shock syndrome are well documented.

Neurological manifestations of dengue, though uncommon, are increasingly recognized and include encephalopathy, seizures, and cerebrovascular events. Cerebral venous sinus thrombosis (CVST), in particular, is a rare but serious condition. It results from impaired venous drainage leading to raised intracranial pressure and potentially hemorrhagic infarctions. In children, CVST can be particularly challenging to diagnose due to non-specific symptoms.

2. Case Report

An 11-year-old female child with no prior medical history presented to the emergency department, santhiram medical college, Nandyal, with a 5-day history of high-grade and intermittent fever, and vomiting of 5 episodes. On evaluation, she was found to be hemodynamically stable but clinically dehydrated. Laboratory investigations revealed thrombocytopenia and positive dengue serology (NS1 and IgM). She was admitted into paediatric ward and kept on supportive treatment such as I. V fluids, Anti – pyretics.

On day 2 of admission, the child developed acute onset headache, vomiting, blurring of vision, and an episode of transient loss of consciousness. On examination child was lethargic and Neurological examination revealed neck stiffness and positive Kernig's sign. Ophthalmologic assessment confirmed bilateral papilledema.

Considering the acute neurological deterioration, an urgent MRI brain with MR venography was performed, which showed thrombus formation in the superior sagittal sinus, right sigmoid sinus, and bilateral transverse sinuses—confirming the diagnosis of CVST due to dehydration with underlying dengue infection.

Anticoagulation therapy with oral warfarin was initiated and monitored with PT and INR levels weekly. She showed gradual clinical improvement with resolution of neurological symptoms and normalization of platelet count. The child was discharged in stable condition and advised continued anticoagulation with regular follow-up. A repeat MRI brain with venogram was done after 3 months which revealed recanalization. Oral warfarin was tapered gradually and stopped over a period of 3 months.

3. Discussion

Cerebral venous sinus thrombosis is an uncommon but severe neurological manifestation in the spectrum of dengue complications. It can occur secondary to hemoconcentration, endothelial dysfunction, or systemic inflammation and profound dehydration due to plasma leakage.

Although dengue typically manifests with systemic symptoms such as fever, myalgia, rash, and bleeding diathesis, the recognition of its neurological sequelae has grown in recent years, particularly in severe or atypical presentations. While hemorrhagic manifestations are more commonly reported in dengue-related cerebrovascular

complications, thrombotic events such as CVST are exceedingly rare, particularly in the pediatric population.

In our patient, the development of CVST was likely precipitated by severe dehydration, a known prothrombotic state, compounded by systemic endothelial activation and inflammatory cytokine release—hallmarks of dengue pathogenesis. Importantly, the patient lacked other traditional risk factors for thrombosis, strengthening the presumed causal link with dengue infection and associated volume depletion.

The clinical presentation of CVST can be non-specific and may include persistent headache, cranial nerve deficits (as seen with diplopia in our case), seizures, papilledema, or altered sensorium. Due to its protean manifestations, a high index of suspicion is essential for timely diagnosis. The 2009 WHO dengue guidelines have also acknowledged neurological involvement, broadening the clinical spectrum to include such complications.

Neuroimaging with MRI and MR venography is the gold standard for diagnosing CVST and was pivotal in this case, enabling early initiation of therapy. While anticoagulation in dengue patients raises concerns—particularly in the setting of thrombocytopenia—literature supports its cautious use in selected patients. In our patient, anticoagulation was well tolerated and contributed to a favorable neurological outcome.

A review of available literature highlights only a few pediatric cases of dengue-associated CVST, most of which report good clinical recovery when diagnosed and treated early. This suggests that while rare, CVST in dengue is likely underreported and may go unrecognized in the absence of neuroimaging. Thus, routine consideration of CVST in any dengue patient presenting with neurologic symptoms is essential, especially in the setting of persistent or unexplained symptoms like headache, diplopia, or seizures.

This case highlights the critical importance of early hydration in dengue fever and the need for heightened awareness among clinicians to detect and manage rare but treatable neurological complications like CVST. CVST should be considered in dengue patients with persistent headaches, seizures, altered sensorium, or papilledema.

4. Conclusion

This case highlights the importance of considering CVST in children with dengue fever presenting with dehydration. Clinical suspicion followed by timely neuroimaging can significantly impact outcomes. In endemic regions, clinicians must be vigilant for such rare complications, especially during seasonal dengue outbreaks. Proactive hydration and early recognition of warning signs can help prevent severe complications.

Figures

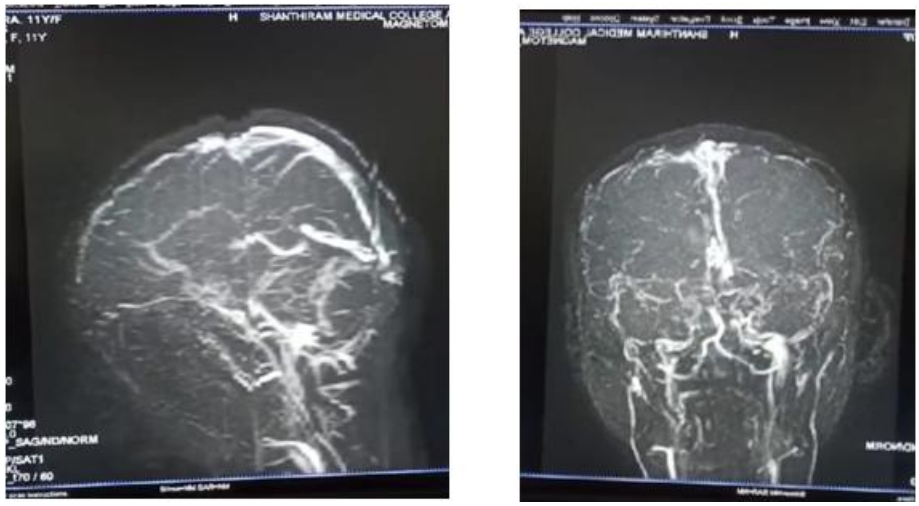

Figure 1: MRI Venogram showing thrombus in superior sagittal sinus and bilateral transverse sinuses

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