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Case Report

Hemorrhagic viral encephalitis: an unusual presentation of chikungunya viral infection

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ABSTRACT

Chikungunya is a mosquito borne alpha virus that is implicated in causation of viral fever with arthralgia which is literally translated as "to become contorted" depicting the severity of the pain. The infection in itself is self-limiting, however the joint pain and myalgia associated with it might linger till weeks, months or even years. Some cases also progress to the viral fever associated complications such as meningitis, encephalitis and Guillain–Barré syndrome. Though, some cases of encephalitis have been reported, it is a relatively rare complication. Here we present a case of a 17 years old male with viral fever secondary to Chikungunya infection which progressed to hemorrhagic encephalitis which is relatively unknown and rare complication of the infection.

Keywords: Chikungunya, Viral fever, Hemorrhagic encephalitis

INTRODUCTION

Chikungunya is an *Aedes* mosquito–transmitted infection caused by chikungunya virus, an ribonucleic acid (RNA) virus in the family *Togaviridae*.[1] Chikungunya virus was first isolated in Calcutta, India, in 1963,with several reported outbreaks in India since then. The first isolation of the disease worldwide was in 1952, following an outbreak on the Makonde Plateau. The symptoms include fever, headache, rash, and severe arthralgia.[2] Chikungunya virus, an Old-World alphavirus and neuro-chikungunya is relatively infrequent.[3] Symptoms usually appear 4–7 days after exposure to virus. Although chikungunya fever is a self-limiting disease and the associated fatality rate is low, Chikungunya-related death has been reported in young infants, the elderly, and people with pre-existing conditions such as cardiovascular disease, diabetes, kidney disease, and chronic liver disease.[2] Strong immune responses against the virus are seen in patients with persistent polyarthralgia caused by a CHIKV infection.

These responses include increased secretion of pro-inflammatory mediators and immune cell infiltration into synovial tissues, such as macrophages, natural killer (NK) cells, and CD4+ T cells. Interleukin 6 (IL-6) and granulocyte-macrophage colony-stimulating factor (GM-CSF) levels were shown to be associated with an increased prevalence of persistent joint pain, suggesting a potential link between CHIKV infection and chronic arthritic symptoms.

CASE REPORT

A 17-years-old male brought by relatives with history of high-grade fever of 4 days duration associated with polyarthralgia and altered sensorium since 1 day and one episode of convulsion in the morning. Patient was drowsy and unresponsive hence intubated and admitted in intensive care unit (ICU). On examination, he was semiconscious, no limb movements, and an extensor plantar response. Random blood sugar level (RBSL) was 115 mg/dl, complete blood count was normal and peripheral smear negative for malaria parasite. Serum Na^+, K^+, Cl^+, Ca^{2+}, Mg^+, urea and creatinine was within normal limit. Fundus examination was normal. Computed tomography (CT) brain plain showed areas of hypodensities involving bilateral frontal lobes, thalami and cerebellar hemisphere s/o encephalitis. Cerebrospinal fluid

(CSF) analysis showed increased protein and sugar without any nucleated cells. CSF adenosine deaminase level was 5.5 IU/l. Serum real time polymerase chain reaction (PCR) was positive for chikungunya virus and negative for dengue virus, Zika virus, West Nile virus, *Salmonella spp*. and *Leptospira spp*. Similarly, viral marker of CSF was positive for Chikungunya virus. Magnetic resonance imaging (MRI) brain showed altered signal intensity in form of T2/FLAIR hyperintensity seen involving cortex and subcortical white matter of bilateral frontal lobes, high parietal lobes, bilateral thalami and bilateral hippocampal areas. Many of these areas show patchy blooming on SWI and patchy diffusion restriction on DWI without any focal lesion f/s/o hemorrhagic viral encephalitis.

Patient was improved with IV steroids and supportive treatment, slowly weaned off the ventilator and shifted to ward. Patient discharged after 10 days of admission and had no neurocognitive deficit at the time of discharge.

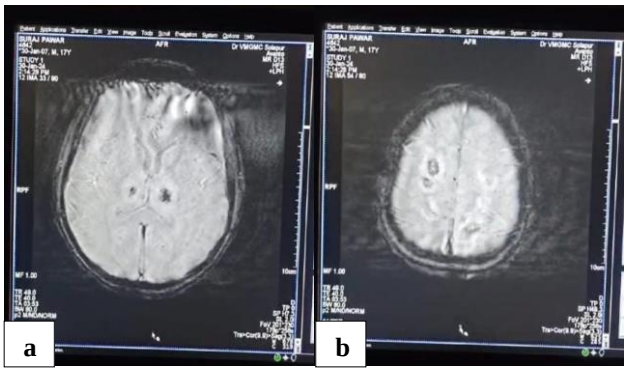

Figure 1 (a and b): MRI shows patchy blooming on SWI and patchy diffusion restriction on DWI without any focal lesion f/s/o hemorrhagic viral encephalitis.

DISCUSSION

Symptomatic Chikungunya fever infections typically result in a self-limited systemic febrile illness associated with rash and arthralgia. Importantly, CHIKV may present similarly to numerous other infectious causes of systemic febrile illness in the tropics, including malaria, dengue, and other arthropod-borne infections.

A wide variety of chikungunya-associated neurological manifestations have been reported, such as encephalitis, myelopathy, peripheral neuropathy, myelitis, and meningoencephalitis.[7] Despite these uncommon findings, there has been a recent increase in reports describing neurologic manifestations of CHIK infections, mainly from Reunion Island and India, where a massive epidemic of CHIK involving millions of patients occurred.[4] While encephalitis represents an atypical presentation of Chikungunya fever, the clinical, radiologic, and detection of virus in serum and CSF by real time PCR support the diagnosis in this case. There have been few reports of detailed neuroimaging findings for neuro-chikungunya. As in this patient brain MRI abnormalities were exclusively located in the subcortical white matter. Such findings were rather unique and were also reported in patients with CHIK in India.[5] The pathogenesis of neuro-chikungunya is not well understood because few autopsies with full virologic studies have been reported.

It remains uncertain whether neurological symptoms are due to persistence of the virus or inappropriate immune response.[6]

Reason for hemorrhagic encephalitis remains unclear as patient doesn't have any other bleeding manifestation and need more research. Dengue, Japanese and Herpes encephalitis are common in the subcontinent and should be considered in differential diagnosis. Although MRI appearances are typical in these conditions like bilateral thalamic and basal ganglia involvement in Japanese encephalitis, bilateral temporal and basifrontal lobes in herpes encephalitis.[8]

There is no specific treatment for Chikungunya encephalitis. Treatment is mainly supportive.

CONCLUSION

In conclusion, though the presentation of Chikungunya fever as encephalitis is very rare, diagnosis should be suspected in a patient from an endemic region with typical clinical and imaging features of encephalitis.

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REFERENCES

1. Palaux G, Gaüzere BA, Jaureguiberry S, Strobel M. Chikungunya, an epidemic arbovirosis. Lancet Infect Dis. 2007;7:319-217.
2. Shah KV, Gibbs CJ Jr, Banerjee G. Virological investigation of the epidemic of hemorrhagic fever in Calcutta: isolation of three strains of Chikungunya virus. Indian J Med Res. 1964;52:676-83.
3. Chusri S, Siripaitoon P, Hirunpat S, Silpapojakul K. Case reports of neuro-Chikungunya in southern Thailand. Am J Trop Med Hyg. 2011;85(2):386-9.
4. Tournebize P, Charlin C, Lagrange M. Neurological manifestations in chikungunya: about 23 cases collected in Reunion Island. Rev Neurol (Paris). 2009;165:48-51.
5. Ganesan K, Diwan A, Shankar SA, Desai SB, Sainani GS, Katrak SM. Chikungunya encephalomyeloradiculitis: report of 2 cases with neuroimaging and 1 case with autopsy findings. AJNR Am J Neuroradiol. 2008;29:1636-7.
6. Condon RJ, Rouse IL. Acute symptoms and sequelae of Ross River virus infection in South-Western Australia: A follow up study. Clin Diagn Virol. 1995;3:273-84.

7. Khongwichit S, Chansaenroj J, Chirathaworn C, Poovorawan Y. Chikungunya virus infection: molecular biology, clinical characteristics, and epidemiology in Asian countries. J Biomed Sci. 2021;28(1):84.
8. Nadarajah J, Madhusudhan KS, Yadav AK, Gupta AK, Vikram NK. Acute hemorrhagic encephalitis: An unusual presentation of dengue viral infection. Indian J Radiol Imaging. 2015;25(1):52-5.

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