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Muhammad Owais Hashmat
Aga Khan University, Karachi

Dureshahwar Kanwar
Aga Khan University, Karachi

Iffat Khanum Khanum
Aga Khan University, Karachi

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“CHIKUNGUNYA ENCEPHALITIS: USUAL PRESENTATION AT AN UNUSUAL TIME. A CASE REPORT”

Muhammad Owais Hashmat¹, Dureshahwar Kanwar¹, Iffat Khanum²

¹ Section of Neurology, Department of Medicine, Aga Khan University Hospital, Karachi

² Section of Infectious Diseases, Department of Medicine, Aga Khan University Hospital, Karachi

Correspondence to: Dr. Muhammad Owais Hashmat Email: doc.owais@gmail.com

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ABSTRACT

CHIK is an arboviral infection caused by chikungunya virus transmitted by Aedes mosquito worldwide. It usually manifests as a self-limiting acute febrile illness with rash, body ache and severe polyarthralgia; in some patients, symptoms persist up to months or even years. Neurological manifestations are relatively uncommon. In recent years Pakistan and other South East Asian countries have been hit several times by its epidemics¹. We report a case of a middle-aged male who presented in our hospital with acute febrile illness along with neurological manifestations. Extensive laboratory investigations were done and he was diagnosed with seropositive CHIKV. He was treated symptomatically and recovered without any complication. Although previously cases of chikungunya meningoencephalitis have been reported in Pakistan during epidemics; such cases sporadically have not been reported so far¹.

KEYWORDS: case report, meningoencephalitis, CHIKV, epidemic

CASE PRESENTATION: CHIKV usually manifests as a self-limiting acute febrile illness with rash, body ache and severe polyarthralgia; transmitted by Aedes species of mosquito. Neurological manifestations are relatively uncommon. In November 2017, a 48-year-old man from Karachi presented to our hospital with a 10-day history of fever, headache, arthralgia and altered mental status. He had no recent travel history. His exposure history was notable for recent mosquito bites. On general physical exam, there was no rash. He was drowsy, responding on verbal stimulus but did not follow commands. His neck was stiff. Cranial nerves were intact. Fundus examination was normal. There was no focal deficit on motor neurological examination. He had two episodes of witnessed tonic clonic seizures of brief duration during hospital stay and was managed on intravenous Levetiracetam. On admission his routine baseline investigations were sent. His hemoglobin level was 12.9 g/dl, platelet count 166,000/l, white blood cell (WBC) count was 3,900/l with 59.6% neutrophils, 27.7% lymphocytes, 10.1% monocytes and 2% eosinophils. Creatinine level was 0.8 mg/dl, and liver function tests were within normal limits. Urinalysis showed no evidence of infection; urine toxicology screen was negative. Lumbar puncture revealed an opening pressure of 18 cm of water, 5 WBC/l, 0 red

blood cells/l, glucose of 84 mg/dl (serum glucose=140 mg/dl), and protein level of 47 mg/dl (See Table 1). He was admitted in the neurology ward. CT and MRI of the Brain with contrast were unremarkable. Electroencephalography (EEG) showed diffuse slowing. No epileptiform discharges were seen. Bacterial cultures from blood and CSF were negative. The following infectious disease testing was performed and was negative: dengue serology; and CSF PCRs for E. Coli, Hemophilus influenza, Listeria, Neisseria meningitidis, Streptococcus, Enterovirus, Herpes simplex virus, Human parvo virus, Varicella-zoster virus, Cytomegalovirus and Cryptococcus. Although there was no epidemic of CHIK in region; serological specimens were sent to laboratory for CHIKV, dengue, Plasmodium falciparum and other Plasmodium species as well. Malaria and Dengue were negative however on day two of presentation serum anti-CHIKV IgM was found to be positive. His symptoms improved with supportive treatment of intravenous fluid replacement and antiepileptic medications along with antipyretics. No specific antiviral medications were given. A week after admission in hospital, patient was discharged in stable condition. He continued follow up for six months and no complications were noted.

DISCUSSION:

A wide spectrum of neurological manifestations including meningoencephalitis, myelopathy and neuropathy have been reported following CHIKV infection (see table2)^{1,2,3}. In one retrospective study⁴, 147 (4.1%) patients with neurological manifestations out of 610 patients with chikungunya infection were reported with presentation of encephalitis (11%), meningoencephalitis (2%), epileptic seizures (2%), Guillain-Barre syndrome (1%), cerebellar syndrome (< 1%) stroke (< 1%), and myelomeningoencephalitis (< 1%). In one case series⁵, altered behavior or altered mental status was most common (95%); other features such as headache (30%), seizures (26%) and motor dysfunction (4%) were also noted. Cerebrospinal fluid (CSF) findings were chiefly elevated CSF protein levels, normal glucose levels and pleocytosis. The diagnosis of chikungunya infection was serologically confirmed by finding either CHIKV specific IgM or RT-PCR in these patients. As in our case, patient had fever, headache, arthralgia, altered mental status and seizures and EEG changes were non-specific mostly slow waves as described in previously described case series along with unremarkable neuroimaging.

Overall, CHIKV infection can result in a wide variety of neurological conditions (Table 2), occurring in up to one third of patients. Encephalitis appears to be the most common neurological manifestation, its incidence ranging from 11 to 18%^{4,5}. Certainly, difficulties may arise in determining whether CHIK infection is the definite cause of the neurological manifestations, especially during non-epidemic seasons and in areas where the prevalence of the disease is low. In many of the studies as noted in literature, the reported degree to which investigations were performed to exclude other infections was variable⁴⁻⁹. It is however important to remember that cases with neurological manifestations can occur without any epidemic. Diagnosis is mainly clinical, along with laboratory confirmation of recent CHIKV infection (Table 1). EEG appears unhelpful in diagnosis. CSF findings appear to be similar to those seen in other viral encephalitis/meningitis: elevated proteins, normal glucose and pleocytosis^{6,7}. However, all these cases presented in epidemics and our case is significant to report as it presented in the non-epidemic season with a serious neurological manifestation. Case series of patients in non-epidemic season are currently not available in literature to the best of our knowledge.

CONCLUSION:

To our knowledge, previously no cases of chikungunya encephalitis have been reported in absence of an

ongoing epidemic in Pakistan. Therefore, it is important to consider chikungunya infection as the cause of symptoms in patients presenting with neurological manifestations together with features of febrile illness, sporadically in the off season as noted in our patient.

Investigation	Result
FULL BLOOD COUNT	
Hb	12.9 g/dL
RBC	500/L
MCHC	36%
MCV	69 fL
WBC	3900/L
Neutrophils	59.6%
Lymphocytes	27.7%
Basophils	0.6%
Monocytes	10.1%
Eosinophils	2%
Platelets	166,000/L
URINALYSIS	
Specific gravity	1020
pH	5.0
Protein	25 mg/dL
Leucocytes	0/HPF
RBC	<2/HPF
Nitrite	Negative
URINE TOXICOLOGY	
Negative	
BLOOD CHEMISTRY	
Urea	9 mg/dL
Creatinine	0.8 mg/dL
Sodium	136 mEq/L
Potassium	3.6 mEq/L
Bicarbonate	24 mEq/L
Calcium	8.6 mg/dL
FBS	101 mg/dL
LIVER FUNCTION TESTS	
Bilirubin (total)	1.2 mg/dL
Direct bilirubin	0.5 mg/dL
Alkaline phosphatase	215 U/L
Aspartate transaminase	30 U/L
Alanine transaminase	25 U/L
Prothrombin time	10 sec
Control (PT)	11.1 sec
INR	0.9
CSF D/R	
Opening pressure	18 cm of water
WBC	5/L
RBC	0/L
Glucose	84 mg/dl (serum=140 mg/dl)
Protein	47 mg/dL

Table 1. List of baseline laboratory investigations

Frequent manifestations	Less frequent manifestations
Encephalopathy and encephalitis	Seizures with or without fever
Myelopathy	Behavioral changes
Encephalomyelopathy	Sensorineural hearing loss
Myeloneuropathy	Stroke
Guillain Barre syndrome	Cerebellitis
Acute disseminated encephalomyelitis	Meningism
Neonatal hypotonia	Cranial nerve palsies (i-e 3 rd and 6 th nerves)
Neuro-ocular disease (uveitis, retinitis, optic neuritis)	Encephaloneuropathy
	Carpal tunnel syndrome

Table 2. List of neurological manifestations associated with Chikungunya virus

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Author's contribution:

Muhammad Owais Hashmat: concept, data collection, data analysis, manuscript writing, manuscript review

Dureshahwar Kanwar: concept, data collection, data analysis, manuscript writing, manuscript review

Iffat Khanum: concept, data collection, data analysis, manuscript writing, manuscript review