Medial Temporal Lobe Encephalitis associated to Chikungunya Virus Infection: A Case Report during First Epidemic in Americas

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Abstract*—Chikunguniya can be associated with encephalitis which is a rare complication of chikunguniya. Such a rare case was attended at National University Hospital (Hondura) in August 2015, which was studied in detail. A 64 years, Honduran patient was admitted during the convalescent period of an acute febrile illness with arthralgias one month prior. Two weeks later, he developed a severe inability to form new memories disorientation to date and time; forgetting family member´s names and daily routines. The patient exhibited spontaneous crying and sadness. Premorbid cognitive, behavioral and functional abilities were normal. Patient was evaluated and investigated. On investigation Chikungunya IgM antibodies were positive and on Brain MRI revealed predominantly right medial temporal lobe hyperintensities in Diffusion weighed images; also seen in FLAIR sequences. Patient was confirmed as Chikunguniya case associated with medial temporal lobe encephalitis. So it is suggested that patients presenting with a rapidly evolving amnestic syndrome after an acute febrile illness with polyarthralgias in an endemic region should be tested for the Chikungunya virus. More cases must be described and studied, however, to better characterize this condition.*

Keywords: **Temporal Lobe, Encephalitis, Chikungunya.**

I. INTRODUCTION

The first autoctonous cases of the Chikungunya virus infection reported in the Americas occurred in December, 2013, in the island of Saint Marteen. Cases extended throughout the region, reaching Honduras during the second part of the year 2014.[1]

The Chikungunya virus is an arbovirus member of the genus Alphavirus (Family: Togaviridae). It is transmitted through the Aedes mosquito. The virus produces a typical clinical presentation of fever and arthralgias; but atypical presentations, mostly neurological, have been described in up to 0.5% of cases. Case definitions have been proposed by WHO.[2] Neurological atypical presentations include encephalitis, Guillain Barre Syndrome, encephalomyelitis, seizures and optic neuritis. Our patient meets diagnostic criteria for Chikungunya virus infection.

Focal unilateral or bilateral temporal lobe encephalitis has been classically described as part of the Herpesvirus encephalitis. The virus typically affects the temporal and inferior frontal lobes first and more severely, and then spreads to the rest of the brain.[3] Other etiologies of bilateral temporal encephalitis described infrequently include non-polio enterovirus, Japanese encephalitis (JE) virus and Varicella Zoster Virus.[4,5]

Other conditions that affect selectively the medial temporal lobe, such as auto immune limbic encephalitis are unlikely in this patient, due to the acute course and rapid, full restoration of cognitive and functional abilities without immunologic treatment.[6]

Zika virus, CHIKV, and DENV have co-circulated in many regions of the Americas over the past year. While the neurological complications of ZIKV infection have been the cause of much concern during this outbreak, less attention has been paid to the neurological manifestations associated with acute or recent CHIKV and/or DENV infections.[7,8] Clinical diagnosis cannot reliably distinguish symptomatic infections caused by these viruses.[9]

II. METHODOLOGY

A typical case of Chikunguniya with encephalitis was presented during first epidemic in Americas in Hospital Escuela Universitario, Honduras. Case was studied in detailed and case report was developed to publish.

III. CASE REPORT

A 64 years, Honduran patient was admitted to the National University Hospital in August 2015 during the convalescent period of an acute febrile illness with arthralgias one month prior. Two weeks later, he developed a severe inability to form new memories disorientation to date and time; forgetting family member´s names and daily routines. The patient exhibited spontaneous crying and sadness. Premorbid cognitive, behavioral and functional abilities were normal.

The patient is a retired engineer residing in an urban area but dedicated to agriculture. He had not traveled outside the country recently. He suffers from hypertension and diabetes with good treatment adherence.

Upon admission, he presented as a collaborative pleasant man. His vital signs were normal with no fever. His physical examination was unremarkable, with no cardiovascular, gastrointestinal, joint or skin abnormalities.

A MMSE performed rated 21/30, with 6 points lost in temporo-spatial orientation and 3 in the verbal memory task. Cranial nerve, motor and sensory evaluations were normal. There was no nuchal rigidity. There were no signs of head trauma or convulsive activity.

His laboratory exams revealed:

- CBC: Mild elevation of neutrophils; erythrocytes and platelets were within normal limits
- Non fasting glucose: 161 mg/dl; Renal function tests and electrolytes were normal
- ALT and ALP levels were elevated less than twofold

A lumbar puncture was performed obtaining clear CSF containing 177 mg/dl of proteins; 20 cells (neutrophils 3%; lymphocytes 97%) and few RBC. Glucose levels were not reported. No bacteria, fungi nor Tuberculosis bacilli were observed. Bacterial and fungal cultures were negative.

Several Laboratory tests were also performed to exclude infectious agents: Serum HIV antibody testing and PCR for Herpes simplex viruses 1 / 2 in CSF; the results were negative. IgG antibodies for CMV and EBV was tested using EIA; both were positive.

Arbovirus infection in a plasma sample was tested: Dengue NS1 antigen, Dengue IgM/IgG antibodies and Chikungunya IgM antibodies (RUO CHIKjj Detect^{TM} IgM ELISA (InBiOS International Inc. Seattle USA). Only Chikungunya IgM antibodies were positive.

Note: The Zika virus had not been reported in the country at the time of presentation of this case.

A scalp EEG was normal and a Brain MRI revealed predominantly right medial temporal lobe hyperintensities in Diffusion weighed images; also seen in FLAIR sequences. Upon administration of gadolinium, right medial cortical temporal lobe enhancement was observed.

Figure 1
Brain MRI revealed predominantly right medial temporal lobe hyperintensities in Diffusion images

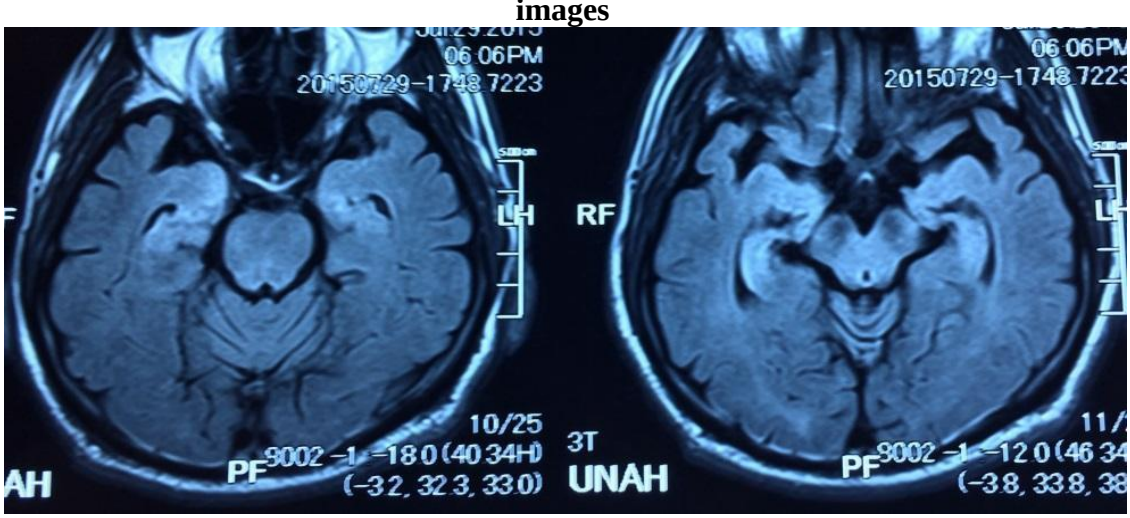
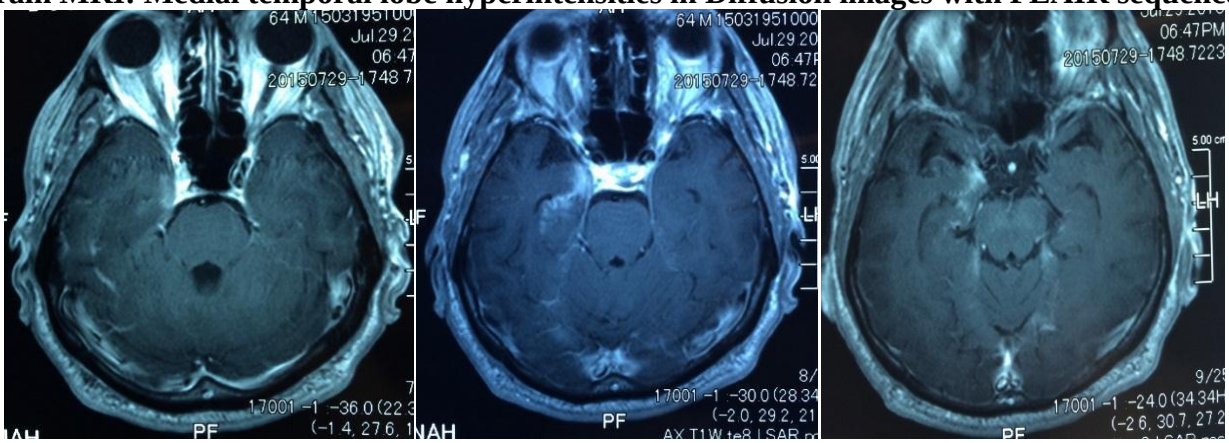


Figure 2,3,4
Brain MRI: Medial temporal lobe hyperintensities in Diffusion images with FLAIR sequences



Telephone follow up to the patient and family was made to assess cognitive and functional recovery, which was achieved completely. The patient returned to his personal, working and social activities without residual symptoms.

IV. DISCUSSION

The Chikungunya virus produces a typical clinical presentation of fever and arthralgias; but atypical presentations, mostly neurological, have been described in up to 0.5% of cases. Case definitions have been proposed by WHO.[2] Neurological atypical presentations include encephalitis, Guillain Barre Syndrome, encephalomyelitis, seizures and optic neuritis. Our patient meets diagnostic criteria for Chikungunya virus infection.

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The authors describe a patient with lymphocytic pleocytosis and elevated proteins in CSF after a febrile acute illness with polyarthralgias and rash. Bilateral medial temporal hyperintensities were observed in brain MRI and Chikungunya antibodies were found in CSF and serum. Complete recovery occurred.

V. CONCLUSION

It is suggested that patients presenting with a rapidly evolving amnestic syndrome after an acute febrile illness with polyarthralgias in an endemic region should be tested for the Chikungunya virus. More cases must be described and studied, however, to better characterize this condition.

CONFLICT OF INTEREST

None declared till now.

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