

# Transverse Myelitis Associated with Zika Virus Infection

CASE REPORT

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## Abstract

**Background:** The Zika virus belongs to the family flaviviridae, and is transmitted by the arthropod *Aedes aegypti*. Its major importance is related to the several debilitating neurological manifestations associated with it, such as transverse myelitis.

**Case:** The authors report a case of transverse myelitis in a patient with a previous diagnosis of Zika virus infection. After the image exams and serology, the diagnosis was confirmed and treatment with prednisone was performed with an unsatisfactory clinical outcome.

**Conclusion:** Brazil is the country of greatest concern worldwide due to the thousands of Zika cases with associated neurological complications, causing sequels and physical disabilities. However, cases worldwide have increased substantially.

## Introduction

The Zika virus belongs to the family flaviviridae and it is transmitted by the arthropod *Aedes aegypti* [1]. Zika virus infection is one of the most important emerging viral diseases in the last decade worldwide, due to several debilitating clinical manifestations, sequelae and perinatal involvement with severe cases of congenital Zika syndrome. The World Health Organization (WHO) has designated it as a global public health emergency [2, 3, 4].

Since the first major outbreak in 2007 on the Yap Islands in Micronesia, followed by an outbreak in French Polynesia, Brazil has become the country of greatest concern worldwide with an outbreak that began in April 2015.

Since then, thousands of cases of microcephaly and neurological complications related to Zika virus infection have been described, which occur because this virus is neurotropic [2].

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## Keywords

Zika; Transverse Myelitis.

In the spectrum of neurological complications of Zika virus infection, there are only a few reports in the literature of transverse myelitis, even in Brazil, the country with the highest absolute number of cases [11]. Thus, this study aims to report a case of transverse myelitis associated with Zika virus infection in the Amazon region of Brazil.

## Case report

Patient is male, 23 years old, mason, born in the city of Bujaru, state of Pará, living in the urban area of Ananindeua, Pará, Brazil. He complained of a strength loss in the lower and upper limbs.

The patient had a history of lymphadenopathy, especially in the cervical anterior right, occipital and left inguinal chains at 40 days, accompanied by fever, a mean of 100.4°F, pruritic cutaneous rash with cephalocaudal progression, arthralgia in the elbows, knees and ankles, with arthritis in the knees.

He was received in a basic health unit being diagnosed clinically, without laboratory confirmation, with an infection by Zika virus and sent home with symptomatic medications.

There was an improvement of symptoms, but after four weeks it evolved with low back pain, gait alteration, paraesthesia and paraparesis of ascending pattern, in addition to spasms in the lower limbs. Followed by lower limb paraplegia, urinary retention, constipation, and dysphagia for solids. When presenting urinary retention was attended again in a basic health unit where he received a delay bladder catheter and was referred to Jean Bitar Hospital, in Belém, Pará.

The patient had no comorbidities, diseases or previous surgeries; he also denied any relevant family medical history.

At physical examination, he was in a regular state, conscious and oriented in time and space, acyanotic, feverish at touch, eupneic in ambient air, hydrated, pale, with conjunctival hyperemia and tachycardia (CF 117 bpm). He presented systolic murmur in pul-

monary focus, pulmonary auscultation without alterations, and abdomen with absence of sensitivity.

At the physical neurological examination, the patient had no alterations in cranial nerves. Sensitive level in T4, loss of tactile and pain sensitivity with preservation of proprioception. Hyperesthesia in thorax and upper limbs. Slow speech, muscle strength degree 0 in the lower limbs, and degree 4 in the upper limbs, symmetrical. Plantar reflex was indifferent bilaterally.

Initial laboratory investigations showed a hemoglobin level of 144 g/L, a leukocyte count of  $15.2 \times 10^9$  cells/L with 22% of leukocytes, 66% of neutrophils, 2% of rods, 2% of monocytes, a normal differential, and platelet count of  $300 \times 10^9$  cells/L. Levels of creatinine, electrolytes, AST and ALT, and alkaline phosphatase were within reference ranges. CPK of 6405 U/L e HSV of 31. Serologies for HIV, hepatitis, CMV, and Chikungunha were negative. Normal coagulogram and negative loop proof. Urine type 1 without changes; however, serology for Zika IgM reagent (enzyme immunoassay).

Lumbar puncture was performed with cerebrospinal fluid (CSF) analysis: protein 89, glucose 57, cytometry  $1.5 \times 10^8$  cells/mL, mononuclear 95%, negative bacterioscopy, negative BAAR, negative direct search for *Cryptococcus* sp., non-reactive VDRL, fungal culture negative, others parameters without alterations.

Computed tomography of the skull, cervical spine, thoracic and lumbosacral spine were normal.

Nuclear Magnetic Resonance (NMR) of the cervical spine performed 10 days after admission, showed an area with alteration of signal in the marrow, at the level of C3 to C5, with high signal in T2 with suppression of fat and fine impregnation by the contrast. (**Figure 1**)

NMR of the encephalon showed an area with high signal in T2 and subcortical FLAIR in the right high convexity without impregnation by the contrast.

**Figure 1:** Nuclear Magnetic Resonance showing the alteration at the level of C3 to C5.



Prednisone was started 0.5 mg/kg/day and pregabalin 75 mg 12/12h.

### Clinical evolution

Patient evolved with grade IV sacral decubitus ulcer requiring broad-spectrum antibiotic therapy and four surgical procedures: surgical debridement twice and repair with muscle-cutaneous flap, in addition to re-suture of the flap.

There was an improvement of the strength of the upper limbs and return of the patellar reflex. He maintained the sensitive level at T4 and deep sensitivity absence in the lower limbs. He evolved with allodynia in the upper limbs, mainly in the proximal region of the right lower limb. He was discharged with a bladder delay catheter, physical therapy and needed an enema to evacuate.

He returned to the neurology clinic maintaining paraplegia of the lower limbs and urinary incontinence, with a slight recovery of muscle strength.

### Discussion

Brazil is the country of greatest concern worldwide due to the thousands of cases of Zika with associated neurological complications [5]. It is of fundamental relevance to report a case of transverse myelitis, considering that there are only few reported cases in literature.

Despite the apparent benignity of the disease, more recently in French Polynesia and Brazil, most severe conditions, including central nervous system involvement (Guillain-Barré syndrome, transverse myelitis and meningitis) associated with Zika have been commonly reported, which indicates how little is known about this disease [6].

Neurological manifestations are among the most serious complications of Zika virus infection, including transverse myelitis [1, 7, 8, 9, 10, 11]. This severity is related to the incapacities generated by the disease, becoming a social problem with a high cost for the public health system.

Treatment is commonly performed with methylprednisolone pulses, with a variable prognosis [12].

### Conclusion

Transverse myelitis should always be remembered as differential diagnosis in patients with neurological symptoms in endemic areas for Zika virus, or in patients who have travelled to endemic areas,

considering its severity and prognosis. In despite of the major concern still being in countries as Brazil, the disease has become more frequent in other countries worldwide, which should be aware of this form of evolution.

The limitations of this study are related to shortage of resources in public hospitals in Brazil, such as the unavailability of electroneuromyography and PCR research of the virus in blood and LCR.

Thus, this study contributes to alert about the need of early diagnosis and appropriate therapeutic management for sequelae prevention.

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## Contribution

Beatriz Vaz Pereira Casagrande, Danielle Oliveira de Sousa, Adriana Kamilly Leitão Pitman Machado, Carolina Ribeiro Mainardi, Carolina Barros Kahwage: literature review, data interpretation, writing, translation and concept of the manuscript.

Carolina Barros Kahwage: Concept and orientation regarding the manuscript, data acquisition and methodological review of the manuscript.

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## Conflict of interest disclosures

The authors declare that there are no conflicts of interest in this case report.

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