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Editorial

Zika virus infection, a new public health challenge



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Brazil is an endemic area for Dengue virus (DENV) infections. Recently, the country was affected by an outbreak caused by Chikungunya virus, and in the last year, a third arbovirus (Zika virus – ZIKV), caused a large number of infections.¹ ZIKV is transmitted by mosquitoes, and was first isolated from a rhesus macaque placed as sentinel during a study about yellow fever in the Zika Forest, Uganda, Africa in 1947.² Since that time, sporadic viral isolations from humans and from a variety of mosquitoes *Aedes* sp have been reported in Africa and Asia. ZIKV, a positive-sense, single-stranded RNA virus, member of genus *Flavivirus*, family *Flaviviridae*, is another flavivirus of a public health importance. The virus has been circulated in Southeast Asia for at least the past 50 years, and a recent epidemic on Yap Island, Federated States of Micronesia, demonstrated that ZIKV is also capable of causing human disease and is expanding its geographic distribution.³

In Bahia, in the first months of 2015, patients at Santa Helena Hospital in Camaçari, a city distant 50 km from Salvador, the third largest city in Brazil, were given a presumptive diagnosis of an acute viral illness by emergency department physicians. The illness was characterized by maculopapular rash, fever, myalgias/arthritis, conjunctivitis, severe rash in arms and legs, and low grade fever. This atypic, dengue-like illness was investigated to confirm the presence of several arbovirus by conventional RT-PCR: West Nile, Mayaro virus, Saint Louis virus and DENV. Since all tests resulted negative, there was only one more possibility to investigate: ZIKV. On March 26 2015, Campos et al. identified ZIKV in sera of affected patients, demonstrating, for the first time, circulation of ZIKV in Brazil and Latin America.⁴ It was immediately informed to the national health authorities (Ministry of Health, Brazil) and the presence of ZIKV (autoctones cases) in Bahia was

confirmed by Brazilian virology reference centers. Since that first report, autoctones cases ZIKV are detected in all Brazilian regions.

ZIKV infection in pregnant women become a matter of concern, because the explosive increase in the incidence of fetal and neonatal Central Nervous System (CNS) abnormalities, such as microcephaly, cerebral calcifications, ventriculomegaly, cerebral destruction lesions, hydrops fetalis, arthrogryposis, detected in association with ZIKV infection.⁵ ZIKV was detected in brain tissue of a fetal microcephaly cases.⁶ Electron microscopy findings suggested *flavivirus* replication in brain tissue. However, little is known on the natural history of ZIKV infection during pregnancy, and how time of infection affects fetal central nervous system development. The infection has also being associated to Guillain-Barré syndrome, suggesting a potential tropism of the virus to the central nervous system.

In a preliminary report from a cohort in Rio de Janeiro, 72 pregnant women with diagnosis of ZIKV in blood, urine or both were followed to describe clinical manifestations in mothers and repercussions of acute ZIKV in fetuses. They detected fetal abnormalities in 12/42 (29%) ZIKV-positive women by ultrasonography, but in none of 16 ZIKV-negative women. They also described fetal abnormalities even when maternal infection occurred at second and third trimester.⁷

Clinical symptoms can be identical to those observed in dengue or Chikungunya infections, making impossible the discrimination between these agents, in areas where they co-circulate. Infection by ZIKV, can be asymptomatic in a large proportion of infected people (around 80%), and usually causes a mild clinical picture characterized by short-term, low-grade fever, followed by maculopapular rash in the first

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or second day and intense pruritus. The definitive diagnosis usually relies on virus isolation, or detection of viral sequences through polymerase chain reaction (PCR). Serologic tests can also be performed to diagnose ZIKV infection with IgM antibodies detected through enzyme linked immunosorbent assays (ELISA) or immunofluorescence.

In the present issue, de Carvalho et al present a detailed review on the current evidence on ZIKV infection and microcephaly. Although this is a fast moving area it is important to provide an update on the dissemination of ZIKV infection, and on the accumulating evidences on its role as a causal agent of fetal malformations, Guillain-Barré Syndrome, and other health problems associated with ZIKV outbreak. Many questions are still open on viral pathogenesis, host immune response, and reliable diagnostics tests for routine use. However, the increasing volume of scientific information that has been published probably will progressively shed some light on many of these still obscure aspects of this new, challenging infection.

Conflicts of interest

The authors declare no conflicts of interest.

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