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# ZIKA VIRUS: AN UPDATE

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## ABSTRACT

Zika virus is a member of family Flaviviridae and the genus Flavivirus, transmitted by Aedes mosquitoes. It causes mild symptoms, similar to a mild form of dengue fever. Since the 1950s, it has been known to occur within a narrow equatorial belt from Africa to Asia. However it spread across Pacific Ocean to French Polynesiain 2014 and to Mexico, Central America, the Caribbean and South America in 2015. The illness cannot yet be prevented by drugs or vaccines. There is evidence that Zika fever in pregnant women can cause abnormal brain development in their fetuses by mother-to-child transmission, which may result in miscarriage or microcephaly.

**KEYWORDS:** Zika virus, microcephaly, flavivirus.

## INTRODUCTION

Zika Virus is a member of the virus family Flaviviridae and the genus Flavivirus, transmitted by daytime-active Aedes mosquitoes, such as A. aegypti and A. albopictus. Its name comes from the Zika Forest of Uganda, where the virus was first isolated in 1947 Zika virus is related to dengue, yellow fever, Japanese encephalitis and West Nile viruses.[1]

The infection, known as Zika fever, often causes no or only mild symptoms, similar to a mild form of dengue fever. Since the 1950s, it has been known to occur within a narrow equatorial belt from Africa to Asia. In 2014, the virus spread eastward across the Pacific Ocean to French Polynesia, then to Easter Island and in 2015 to Mexico, Central America, the Caribbean and South America, where the Zika outbreak has reached pandemic levels.[2] The illness cannot yet be prevented by drugs or vaccines. As of February 2016, there is evidence that Zika fever in pregnant women can cause abnormal brain development in their fetuses by mother-to-child transmission, which may result in miscarriage or microcephaly. It is not yet known whether Zika virus causes microcephaly. A link has been established with neurologic conditions in infected adults.[3]

### Clinical features

It is associated with low-grade fever (<38. 5°C), transient arthritis/arthralgia with possible joint swelling mainly in the smaller joints of the hands and feet, maculo-papular rash often spreading from the face to the body, conjunctival hyperaemia or bilateral non-purulent conjunctivitis along with general non-specific symptoms such as myalgia, asthenia and headaches. The incubation period ranges from 3 to 12 days. The disease symptoms are usually mild and last for 2 to 7 days. Infection may go unrecognised or be misdiagnosed as dengue, chikungunya or other viral infections giving fever and rash.[4-6]

### Pathogenesis

The pathogenesis of the virus is hypothesized to start with an infection of dendritic cells near the site of inoculation, followed by a spread to lymph nodes and the bloodstream. Flaviviruses generally replicate in the cytoplasm, but Zika virus antigens have been found in infected cell nuclei.[7]

### Transmission

Zika virus is transmitted by daytime active mosquitoes and has been isolated from a number of species in the genus Aedes. Zika virus RNA was detected in the amniotic fluid of two fetuses,[6] which indicates that it crossed the placental barrier and that fetal infection is possible. In 2009, it was suggested that Zika virus can be sexually transmitted between humans.[8]

### Vector

In East Africa, ZIKV is maintained in a sylvatic cycle with cyclic epizooty involving non-human primates and a wide variety of sylvatic and peri-domestic Aedes mosquitoes. In Asia, Aedes aegypti has been implicted as the vector. During the outbreak in Yap in Micronesia, Aedes hensilii has been suspected as a vector because of its abundance coinciding with the outbreak. In Singapore, Aedes albopictus is also a potential vector of ZIKV, based on data from experimental infections. Aedes albopictus has been found naturally infected in Gabon. While mosquitoes are the vector, the

reservoir species remains unknown, though serological evidence has been found in West African monkeys.[1]

**Diagnosis**

Diagnostic tests for ZIKV infection include PCR tests on acute-phase serum samples, which detect viral RNA, and other tests to detect specific antibody against ZIKV in serum. WHO recommends RT-PCR testing be done on serum collected within 1 to 3 days of symptom onset or on saliva or urine samples collected during the first 3 to 5 days. Later on, serology through detection of specific IgM and IgG antibodies can be used. An ELISA has been developed at the Arboviral Diagnostic and Reference Laboratory of the CDC (Atlanta, USA) to detect immunoglobulin (Ig) M to ZIKV.[9]

**Problem satement**

According to preliminary estimates from the Brazilian ministry of health, between 440 000 to 1 300 000 cases of Zika virus infections may have occurred in 2015 in Brazilian states with laboratory-confirmed autochthonous cases of Zika virus. Mosquito-borne Zika virus is suspected to be the cause of 2,400 cases of microcephaly and 29 infant deaths in Brazil in 2015.[10]

The Ministry of Health of Brazil has suggested a possible relationship between the increase in notifications of microcephaly and the outbreak of ZIKV infections as the increase is within nine months of the emergence of ZIKV disease in the north-eastern regions of Brazil. The first confirmed cases of ZIKV infection in Brazil were reported in May 2015.[1] Transmission of the virus in Brazil is likely to have started several months before because the disease is new and mild, and could have been unrecognised or misdiagnosed, as dengue and chikungunya epidemics were ongoing. Microcephaly when due to an infection, is usually caused by transplacental infections occurring early in pregnancy and tends to be detected only during the second half of pregnancy or after birth.

**Prevention**

There is currently no vaccine. It is advised to cover exposed skin by wearing long-sleeved shirts and long pants along with use of an insect repellent.If you are also using sunscreen, apply sunscreen first, let it dry and then apply insect repellent. Use permethrin-treated clothing and gear (such as boots, pants, socks and tents). Do not use permethrin directly on skin. Stay and sleep in screened-in or air-conditioned rooms. Use a bed net if the area where you are sleeping is exposed to the outdoors.[1]

**CONCLUSION**

In conclusion, a causative association between microcephaly in newborns and ZIKV infection during pregnancy is plausible, but not enough evidence is available yet to confirm or refute it. As of February 2016 52 travel-associated Zika virus disease cases and no locally acquired vector-borne cases had been reported from the US to the CDC.

Here's a list of the guidelines issued by our health ministry and doctors that you should keep with you:

1. Prevent mosquito breeding around houses. 2. Use mosquito repellents to protect yourself from mosquito bites. 3. Non-essential travel to the affected countries in the Latin American region and the Caribbean should be deferred/cancelled. 4. Pregnant women or women who are trying to become pregnant should defer/cancel their travel to the affected areas. 5. All travellers to the affected countries/areas should strictly follow individual protective measures, especially during the day, to prevent mosquito bites (use of mosquito repellent cream, electronic mosquito repellents, use of bed nets, and dress that appropriately covers most of the body parts). 6. Persons with co-morbid conditions (diabetes, hypertension, chronic respiratory illness, immunity disorders, etc.) should seek advice from the nearest health facility, prior to travel to an affected country. 7. Travellers who complain of fever within two weeks of return from an affected country should report to the nearest health facility. 8. Pregnant women who have travelled to areas with Zika virus transmission should mention about their travel during ante-natal visits in order to be assessed and monitored appropriately.

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