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Review Article
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A Review Article on Zika Virus

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Zika infection is a mosquito borne flavivirus that is the focus of a ongoing pandemic and public health emergency. The rise of Zika infection in Brazil in 2015 proclaimed quick spread all through the Americas as well as in Africa and Asia. Although most Zika infections are characterized by subclinical or mild flu like sickness, extreme signs have been depicted, incorporating Guillain-Barre disorder in grown-ups and microcephaly in infantsborn to infected mothers. Neither an effective treatment nor avaccine is available for Zika infection till this day; in this manner, the general health response essentially concentrates on anticipating contamination, especially in pregnant women. In spite of developing learning about this infection, questions remain in regards to the infection's vectors and repositories, pathogenesis, and hereditary assorted variety. These highlight the need for research to optimize surveillance, patient management, and public health intervention in the current Zika virus epidemic.

Keywords: Zika Virus, Aedesaegypti Transmission, Microcephaly, Treatment, genetically modified mosquitoes.

INTRODUCTION

Zika virus is a mosquito-borne illness that is spread by the Aedes species of mosquito, the mosquito also responsible for the transmission of dengue and chikungunya viruses.

Unlike malaria-carrying mosquitos, this species is mostly active during the day and so barrier methods such as mosquito nets are ineffective. These mosquitos can survive in both indoor and outdoor environments.[1]

The two known species responsible for Zika transmission are the Aedesalbopictus, known as the Asian Tiger mosquito, and the Aedesaegypti species.

The first human case of infection was detected in Nigeria in 1954, and following that there have been further outbreaks in Africa, South East Asia and the Pacific Islands. [2]

While the symptoms of Zika typically pass within the space of a week, there have been recent concerns about the virus are due to a potential link between Zika and birth defects such as microcephaly.

In light of a strongly suspected causal relationship, the World Health Organization (WHO) declared that the Zika virus outbreak constituted a Public Health Emergency of International Concern on 1 February 2016. [3]

Fast facts on Zika

Zika virus cases typically occur in tropical climates

Symptoms of Zika virus infection can last for up to a week

The majority of people infected with Zika virus do not display any symptoms

Cases of Zika virus infection that result in hospitalization are uncommon

A link between maternal Zika infection and infant microcephaly is currently being investigated

As yet, there is not enough evidence to fully characterize the link between the two conditions

Zika infection can spread from a mother to a fetus during pregnancy

At present, there is no treatment for the virus

Avoiding mosquito bites is a key aspect of Zika virus prevention. [1]

How is Zika Virus Transmitted

Zika virus is primarily transmitted to people through the bite of an infected mosquito from the Aedes genus, mainly Aedesaegypti in tropical regions.

Aedes mosquitoes usually bite during the day, peaking during early morning and late

afternoon/evening.

This is the same mosquito that transmits dengue, chikungunya and yellow fever. Sexual transmission of Zika virus is also possible. Other modes of transmission such as blood transfusion are being investigated. [4]

Signs and Symptoms of Zika virus

Signs and symptoms of Zika virus are vague and can last for up to a week. Diagnosis of the virus is typically confirmed with a blood test.

Symptoms of Zika virus include:

Fever, Rash, Joint pain, Conjunctivitis (red eyes), Muscle pain, Headache, Pain behind the eyes, Vomiting. [1]

According to the Pan American Health Organization (PAHO), only 1 in 4 people infected with Zika virus develop symptoms.5 In contrast, the CDC state the figure is 1 in 5. [5]

In the past, there have also been reports of patients developing Guillain-Barré syndrome following a Zika virus infection. Guillain-Barré syndrome is a rare but serious autoimmune disorder that affects the central nervous system. Infection with the Zika virus is rarely severe enough to warrant hospitalization, and it is rarer still for an individual to die as a result.[6]

A growing concern that is currently under investigation is a possible link between maternal Zika virus infection and infant microcephaly. Brazil in particular has seen a surge in infants born with microcephaly since October 2015, at rates that have been reported to be 10 times higher than those in previous years.

These infants have been tested for Zika virus with mixed results - some positive and some negative for the virus.Zika virus has been confirmed to be present in two amniotic fluid samples of microcephalic babies.

To date, there have been no known transmissions of the virus from mother to infant during breastfeeding.[7]

What is microcephaly?

Microcephaly is a neurological condition where an infant's head circumference is significantly smaller than the average size for infants of the same age. Microcephaly can lead to developmental delays in movement and speech among other complications.

Complications of microcephaly include:

Dwarfism or short stature, Facial distortion, Mental retardation, Hyperactivity, Seizures

Microcephaly is believed to be caused by both environmental and genetic factors. While there is currently no direct treatment for microcephaly, supportive therapy can assist infant development.[8]

Zika virus crossed placenta in two cases of microcephaly in Brazil. A new study describes how amniotic fluid retrieved in Brazil from two pregnant women carrying fetuses diagnosed with microcephaly showed evidence of Zika virus.[9]

Zika virus causes microcephaly and other birth defects, confirm CDC

Health officials in the US have concluded that the Zika virus causes microcephaly and other severe brain defects in babies. [10]

Treatment and Prevention

Treatment

Zika virus disease is usually mild and requires no specific treatment. People sick with Zika virus should get plenty of rest, drink enough fluids, and treat pain and fever with common medicines. If symptoms worsen, they should seek medical care and advice. There is currently no vaccine available.[11]

Prevention.

Mosquito bites

Protection against mosquito bites is a key measure to prevent Zika virus infection. This can be done by wearing clothes (preferably light-coloured) that cover as much of the body as possible; using physical barriers such as window screens or closing doors and windows; sleeping under mosquito nets; and using insect repellent containing DEET, IR3535 or icaridin according to the product label instructions. Special attention and help should be given to those who may not be able to protect themselves adequately, such as young children, the sick or elderly. Travellers and those living in affected areas should take the basic precautions described above to protect themselves from mosquito bites.

It is important to cover, empty or clean potential mosquito breeding sites in and around houses such as buckets, drums, pots, gutters, and used tyres. Communities should support local government efforts to reduce mosquitoes in their locality. Health authorities may also advise that spraying of insecticides be carried out.[4]

Vector control operations framework for Zika virus

Sexual transmission

Zika virus can be transmitted through sexual intercourse. This is of concern due to an association between Zika virus infection and adverse pregnancy and fetal outcomes.

For regions with active transmission of Zika virus, all people with Zika virus infection and their sexual partners (particularly pregnant women) should receive information about the risks of sexual transmission of Zika virus. WHO recommends that sexually active men and women be correctly counseled and offered a full range of contraceptive methods to be able to make an informed choice about whether and when to become pregnant in order to prevent possible adverse pregnancy and fetal outcomes. Women who have had unprotected sex and do not wish to become pregnant due to concerns about Zika virus infection should have ready access to emergency contraceptive services and counseling. Pregnant women should practice safer sex (including correct and consistent use of condoms) or abstain from sexual activity for at least the whole duration of the pregnancy.[12]

Genetically Modified Mosquitos

There's good evidence to support the idea that genetic modification of the Aedesaegypti mosquito, for example, could help dramatically reduce its population.

Aedesaegypti is the main vector of the Zika virus, a mosquito-borne illness that has public-health officials around the world on edge. In Brazil, hundreds of babies born to Zika-infected mothers have suffered severe birth defects since last year. Public-health officials, who are calling Zika a global emergency, estimate that number will climb well into the thousands in Brazil alone. In the United States and elsewhere, as mosquito season ramps up, people are bracing for additional outbreaks.

At the same time, in a small Florida community near Key West, the Food and Drug Administration is accepting public comments on a proposal from the biotechnology firm Oxitec to introduce genetically modified Aedesaegyptimales into the local mosquito population. If Oxitec is successful, its technology could help wipe out Aedesaegypti in the region—and protect people from Zika transmission there.

Oxitec's plan is to inject mosquito eggs with DNA that contains lethal genes, then release the genetically modified males from that batch of eggs so they can mate with wild females. (Males

don't bite; so releasing only males is a way to make sure the release of these insects doesn't contribute to the spread of disease.) The offspring of these lab-tweaked males and wild females, having inherited the altered DNA, cannot survive to adulthood. If all goes as planned, the mosquito population should shrink as a result. There's already good evidence that shows Oxitec's approach can work. Field tests in Piracicaba, Brazil, resulted in an 82 percent decline to the mosquito population over an eight-month period, Oxitec says. And there's a compelling need for trying to control the mosquito population this way. Aedesaegypti don't just spread Zika, but also dengue fever, yellow fever, and chikungunya virus. "About 40 percent of the global population is at risk from this species," said Andrew McKemey, an entomologist and the head of field operations for Oxitec. [13]

CONCLUSION

ZIKV is a pandemic that is spreading all through various parts of the world. It turned into the main real ID connected to human birth deformities and made such a critical worldwide situation. Currently, what will happen in future regarding ZIKV epidemic is unpredictable. However, based on the worldwide spread of chikungunya and dengue over the last two decades, it may be assumed that ZIKV has the potential to show similar spread. Further research is required on a quick premise to enhance mosquito control techniques and to create point-of-care laboratory diagnostics, vaccines and antivirals that are appropriate to be used in pregnant women. It is along these lines time to build the level of incorporated and convenient research and enhance our comprehension of the convoluted environments in which the irresistible operators of future pandemics are quickly advancing.

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