Zika virus: A Review Article

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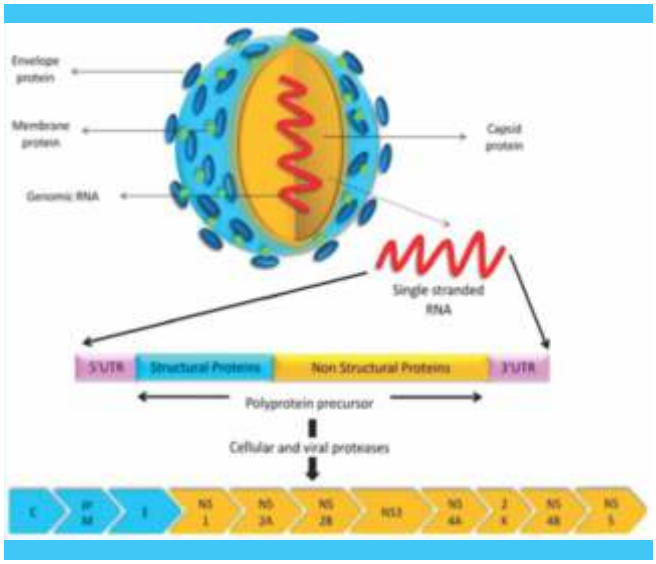
Abstract : Zika virus disease is caused by a virus transmitted by Aedes mosquitoes. People with Zika virus disease usually have symptoms that can include mild fever, skin rashes, conjunctivitis, muscle and joint pain, malaise or headache. These symptoms normally last for 2-7 days. There is no specific treatment or vaccine currently available. The best form of prevention is protection against mosquito bites. The virus is known to circulate in Africa, the Americas, Asia and the Pacific.

Key Words : Zika virus, Aedes mosquitoes.

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.



(Fig No:1 Structure of Zika virus)

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. 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.[1]

In January 2016, the U.S. Centers for Disease Control and Prevention (CDC) issued travel guidance on affected countries, including the use of enhanced precautions, and guidelines for pregnant women including considering postponing travel.

Signs and Symptoms

(Fig No:2 signs & symptoms of Zika Virus Diseases)

The incubation period (the time from exposure to symptoms) of Zika virus disease is not clear, but is likely to be a few days. The symptoms are similar to other arbovirus infections such as dengue, and include fever, skin rashes, conjunctivitis, muscle and joint pain, malaise, and headache. These symptoms are usually mild and last for 2-7 days.

Transmission : Zika virus is transmitted to people through the bite of an infected mosquito from the Aedes genus, mainly Aedes aegypti in tropical regions. This is the same mosquito that transmits dengue, chikungunya and yellow fever.[2] However, sexual transmission of Zika virus has been described in 2 cases, and the presence of the Zika virus in semen in 1 additional case.

Zika virus disease outbreaks were reported for the first time from the Pacific in 2007 and 2013 (Yap and French Polynesia, respectively), and in 2015 from the Americas (Brazil and Colombia) and Africa (Cape Verde). In addition, more than 13 countries in the Americas have reported sporadic Zika virus infections indicating rapid geographic expansion of Zika virus.

Virology :

The Zika virus belongs to Flaviviridae and the genus Flavivirus, and is thus related to the dengue, yellow fever, Japanese encephalitis, and West Nile viruses. Like other flaviviruses, Zika virus is enveloped and icosahedral and has a nonsegmented, single-stranded, positive-sense RNA genome. It is most closely related to the Spondweni virus and is one of the two viruses in the Spondweni virus clade.

A positive-sense RNA genome can be directly translated into viral proteins. In other flaviviruses, such as the similarly sized West Nile virus, the RNA genome genes encode seven nonstructural proteins and three structural proteins. The structural proteins encapsulate the virus.[3] The replicated RNA strand is held within a nucleocapsid formed from 12-kDa protein blocks; the capsid is contained within a host-derived membrane modified with two viral glycoproteins. Replication of the viral genome would first require creation of an anti-sense nucleotide strand.

Diagnosis : Infection with Zika virus may be suspected based on symptoms and recent history (e.g. residence or travel to an area where Zika virus is known to be present). Zika virus diagnosis can only be confirmed by laboratory testing for the presence of Zika virus RNA in the blood or other body fluids, such as urine or saliva.

Prevention :

Mosquitoes and their breeding sites pose a significant risk factor for Zika virus infection. Prevention and control relies on reducing mosquitoes through source reduction (removal and modification of breeding sites) and reducing contact between mosquitoes and people.

This can be done by using insect repellent regularly; wearing clothes (preferably light-coloured) that cover as much of the body as possible; using physical barriers such as window screens, closed doors and windows; and if needed, additional personal protection, such as sleeping under mosquito nets during the day. It is extremely important to empty, clean or cover containers regularly that can store water, such as buckets, drums, pots etc. Other mosquito breeding sites should be cleaned or removed including flower pots, used tyres and roof gutters. Communities must support the efforts of the local government to reduce the density of mosquitoes in their locality.

Repellents should contain DEET (N, N-diethyl-3-methylbenzamide), IR3535 (3-[N-acetyl-N-butyl]-aminopropionic acid ethyl ester) or icaridin (1-piperidinecarboxylic acid, 2-(2-hydroxyethyl)-1-methylpropylester). Product label instructions should be strictly followed. 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.

During outbreaks, health authorities may advise that spraying of insecticides be carried out. Insecticides recommended by the WHO Pesticide Evaluation Scheme may also be used as larvicides to treat relatively large water containers.

Travellers should take the basic precautions described above to protect themselves from mosquito bites.

Zika virus infection linked to development of Guillain-Barré syndrome due to rapid spread of zika virus, at risk countries. Patient of Guillain-Barré syndrome had anti-Zika virus IgM or IgG and had neutralising antibodies against Zika virus.

Treatment : Zika virus disease is usually relatively 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.[4] If symptoms worsen, they should seek medical care and advice. There is currently no vaccine available. Adequate intensive care facilities needed for managing patients with Guillain-Barré syndrome associated with Zika virus.

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