

## ZIKA VIRUS (ZIKV): SYMPTOMS, DIAGNOSIS AND TREATMENT

Archana Jayan

Associate Professor,

Department of Biochemistry,

Universal College of Medical Sciences & teaching Hospital, Bhairahawa, Nepal

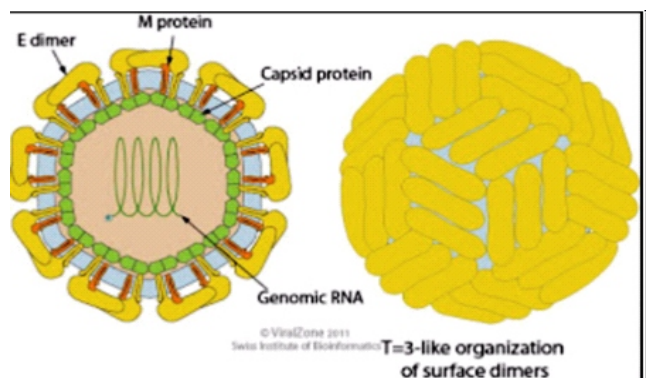
### INTRODUCTION

Zika virus is an emerging mosquito borne virus that was first identified in Zika forest of Uganda in 1947 in rhesus monkeys. The virus name derived from Zika forest. It was lately identified in humans in 1968 for the first time in Nigeria. Various case of Zika virus has been seen in America, Africa and Asia and Pacific regions. Zika virus is spread by *Aedes aegypti* mosquito and possibly the *Aedes albopictus* causing mild fever, rashes and conjunctivitis.

In May 2015, the Pan American Health Organization (PAHO) issued an alert regarding the first confirmed Zika virus infection in Brazil. This virus falls under the Group IV (+) single stranded (ss) RNA, family Flaviviridae, genes Flavi virus, species Zika virus.

### STRUCTURE OF ZIKAVIRUS

1. The virion is approximately 40 nm in diameter with a surface projection of 5-10 nm.
2. Nucleocapsid is 25-30 nm in diameter surrounded by a host membrane derived lipid bilayer.
3. Enveloped.
4. Icosahedral
5. Contains envelop proteins E & M



### SIGN AND SYMPTOMS

It causes mild fever and rash. Other symptoms include muscle pain, joint pain, headache, pain behind the eyes and conjunctivitis. Zika virus disease is usually mild, with symptoms lasting over a few days, swelling observed occasionally (notably of the small joints of the hands and feet). The disease has similar clinical signs to dengue/chikungunya and may be misdiagnosed in areas where dengue is common.

### EPIDEMIOLOGY

The first major outbreak, with 185 confirmed cases, was reported in 2007 Yap Islands. The first case confirmed in Brazil was in May 2015 and country is currently experiencing the largest epidemic ever recorded with 4,40,000 to 13,00,000 suspected cases reported by Brazilian Health Authorities. There are 3174 cases and 38 deaths from microcephaly in Brazil and has been total death of 152 as of 21<sup>st</sup> October 2015 in the world.

### AFFECTED COUNTRIES OF ACTIVE ZIKA VIRUS TRANSMISSION

- |                  |                  |
|------------------|------------------|
| 1. Barbados      | 12. Honduras     |
| 2. Bolivia       | 13. Martinique   |
| 3. Brazil        | 14. Mexico       |
| 4. Colombia      | 15. Panama       |
| 5. Ecuador       | 16. Puerto Rico  |
| 6. El-Salvador   | 17. Saint martin |
| 7. French Guiana | 18. Suriname     |
| 8. Guadeloupe    | 19. Venezuela    |
| 9. Guatemala     | 20. Samoa        |
| 10. Guyana       | 21. Cape Verde   |
| 11. Haiti        | 22. Paraguay     |

### TRANSMISSION OF ZIKA VIRUS

It is transmitted from one person to another through the bite of *Aedes* mosquito mainly *Aedes Aegypti* in tropical regions. These mosquitoes typically lay eggs in and near standing water in things like buckets, bowls, animal dishes, flower pots, and vases. They are aggressive daytime biters, prefer to bite people, and live indoors and outdoors near people. Mosquitoes become infected when they feed on a person already infected with the virus. Infected mosquitoes can then spread the virus to other people through bites. There has been one report of possible spread of virus through blood transfusion and one report of possible spread of the virus through sexual contact. In 2015 Zika virus was also diagnosed in amniotic fluid of two fetuses, which showed that it had crossed the placenta and caused a mother to child infection.

A mother already infected with Zika virus near the time of delivery can pass it on to her new born at the time of birth, but this is rare. To date, there are no reports of infants getting Zika virus through breast feeding. Because of the benefits of breast feeding, mothers are encouraged to breast feed even in areas where Zika virus is found.

## PATHOGENESIS

Incubation period of mosquito is about 10 days. The vertebrate hosts of the virus are primarily monkeys and humans. The pathogenesis of the virus is hypothesized to start with an infection of dendritic cells near the site of inoculation, followed by the lymph nodes and blood streams. Flaviviruses generally replicate in the cytoplasm, but Zika virus antigens have been found in infected cell nuclei. Infection with the virus appears to be linked to the development of unusually small heads and brain damage in new born (microcephaly). This may occur when mother gets infected during first trimester of pregnancy.

## DIAGNOSIS

There are no widely available tests for Zika infection. In most people diagnosis is based on clinical symptoms and epidemiological circumstances. The Sample to be collected in the laboratory is blood, saliva, urine. PCR (Polymerase Chain Reaction): nucleic acid detection by reverse transcriptase-polymerase chain reaction (RT-PCR) targeting the non structural protein 5 genomic region is primary means of diagnosis. It is useful in the first 3 to 5 days of after the onset of symptoms.

## SEROLOGICAL TESTS

1. An ELISA has been developed to detect IgM to ZIKV only after 5 days.
2. Nucleic Acid Amplification Test.
3. NAT for detection of viral RNA can also be performed.
4. Plaque Reduction Neutralization Assay- the plaque reduction utilization assay generally has improved specificity over immunoassays, but may still yield cross reactive results in secondary Flavivirus infections.

## TREATMENT OF ZIKA VIRUS

No specific vaccines or treatment are currently available to treat Zika virus infection. The symptoms are mild- when they appear at all- and usually require only rest, nourishment and other supportive care.

Other symptomatic treatments should be given such as fever, dehydration and pain management.

## PREVENTION AND CONTROL

It involves reducing mosquito population and avoiding bites which occur mainly during the day. Eliminating and controlling *Aedes aegypti* mosquito breeding sites reduces the chances that Zika chikungunya and dengue will be transmitted. To eliminate and control the mosquito, it is recommended to

- Avoid allowing standing water in outdoor containers (flower pots, bottles and containers that collect water) so that they do not become mosquito breeding sites

- Cover domestic water tanks so that mosquitoes can't get in.
- Avoid accumulating garbage: put it in closed plastic bag and keep it in closed containers.
- Unblock drains so that it cannot accumulate standing water.
- Use screens and mosquito nets in windows and doors to reduce contact between mosquitoes and people.

To prevent mosquito bites, it is recommended that people who live in areas where there are cases of the disease, as well as travelers and especially pregnant women should:

- Cover exposed skin with long-sleeved shirts, trousers and hats.
- Use repellents recommended by the health authorities
- Sleep under mosquito nets.

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