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Recent advancement in zika virus

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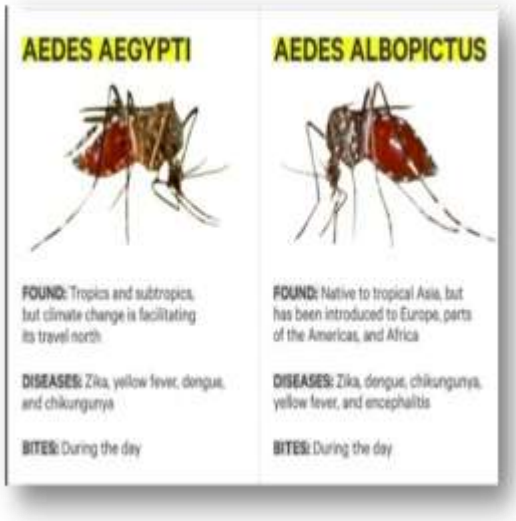
ABSTRACT
Zika virus was first discovered in 1947 and is named after the Zika Forest in Uganda. In 1952, the first human cases of Zika were detected and since then, outbreaks of Zika have been reported in tropical Africa, Southeast Asia, and the Pacific Islands. Zika outbreaks have probably occurred in many locations. Before 2007, at least 14 cases of Zika had been documented, although other cases were likely to have occurred and were not reported. Because the symptoms of Zika are similar to those of many other diseases, many cases may not have been recognized. In March 2015, Brazil reported a large outbreak of rash illness, soon identified as Zika virus infection, and in July 2015, found to be associated with Guillain-Barré syndrome. In October 2015, Brazil reported an association between Zika virus infection and microcephaly. Outbreaks and evidence of transmission soon appeared throughout the Americas, Africa, and other regions of the world. To date, a total of 86 countries and territories have reported evidence of mosquito-transmitted Zika infection.

I. INTRODUTION:

Zika virus



Zika virus is primarily transmitted by the bite of an infected mosquito from the Aedes genus, mainly Aedesaegypti, &Aedesalbopictus in tropical and subtropical regions. Aedes mosquitoes usually bite during the day, peaking during early morning & afternoon/evening.

Figure 1

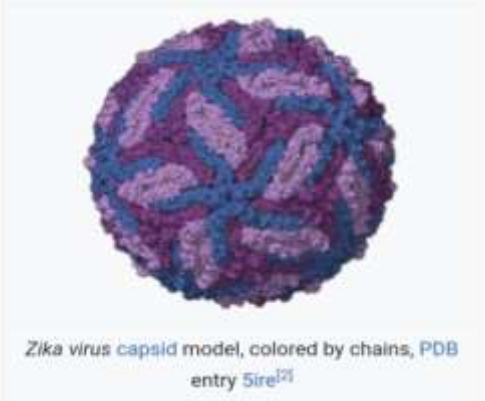


Figure 2

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1) Virus classification

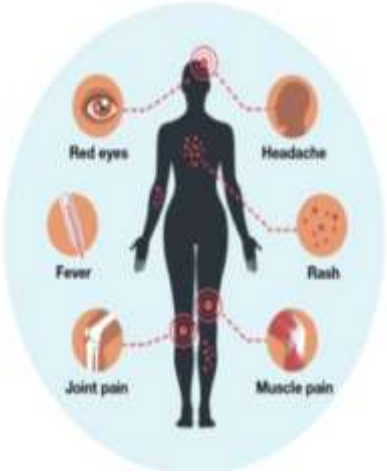
(unranked)	Virus
Kingdom	Orthornavirae
Phylum	kitrinoviricota
Class	Flasuviricetes
Order	Amarillovirales
Familly	Flaviviridae
Genus	Flavivirus
Species	**Zika virus**

2)HowZika is transmitted

Zika can be transmitted:

1. Through mosquito bites
2. From a pregnant woman to her fetus
3. Through blood transfusion (very likely but not confirmed)

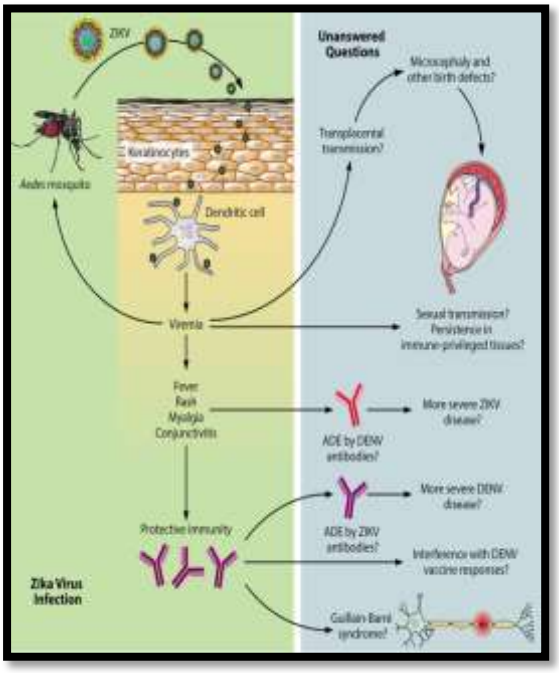
3)Zika symptoms:



Many people infected with Zika virus won't have symptoms or will only have mild symptoms.
The most common symptoms of Zika are

1) Fever
2) Rash
3) Headache
4) Joint pain
5) Red eyes
6) Muscle pain
7) rash
8) itching all over the body
9) conjunctivitis (red eyes)

4) Pathogenesis:



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Zika virus replicates in the mosquito's midgut epithelial cells and then its salivary gland cells. After 5–10 days, the virus can be found in the mosquito's saliva. If the mosquito's saliva is inoculated into human skin, the virus can infect epidermal keratinocytes, skin fibroblasts in the skin and the Langerhans cells. The pathogenesis of the virus is hypothesized to continue with a spread to lymph nodes and the bloodstream. Flaviviruses replicate in the cytoplasm, but Zika antigens have been found in infected cell nuclei.

5) Complications of Zika virus disease

Zika virus infection during pregnancy is a cause of microcephaly and other congenital abnormalities in the developing fetus and newborn. Zika infection in pregnancy also results in pregnancy complications such as fetal loss, stillbirth, and miscarriage, stillbirth, other birth defects. Zika virus infection is also a trigger of Guillain-Barré syndrome, neuropathy and myelitis, particularly in adults and older children. Research is ongoing to investigate the effects of Zika virus infection on pregnancy outcomes, strategies for prevention and control, and effects of infection on other neurological disorders in children and adults

Guillain-Barré syndrome

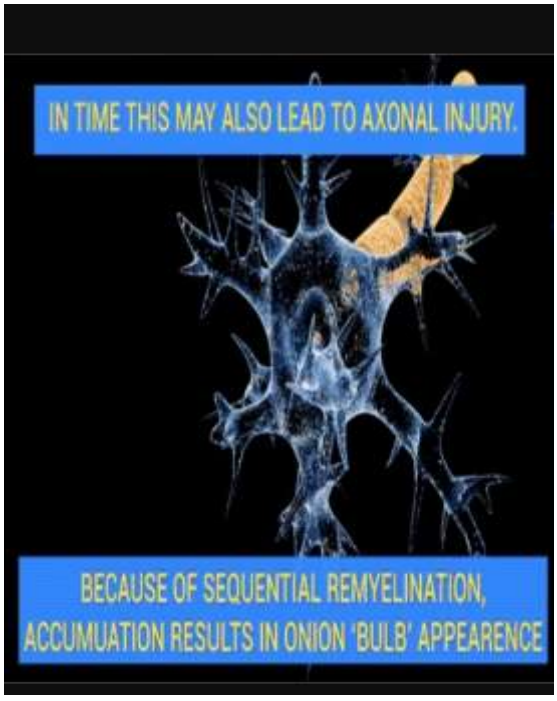

Diagram -1

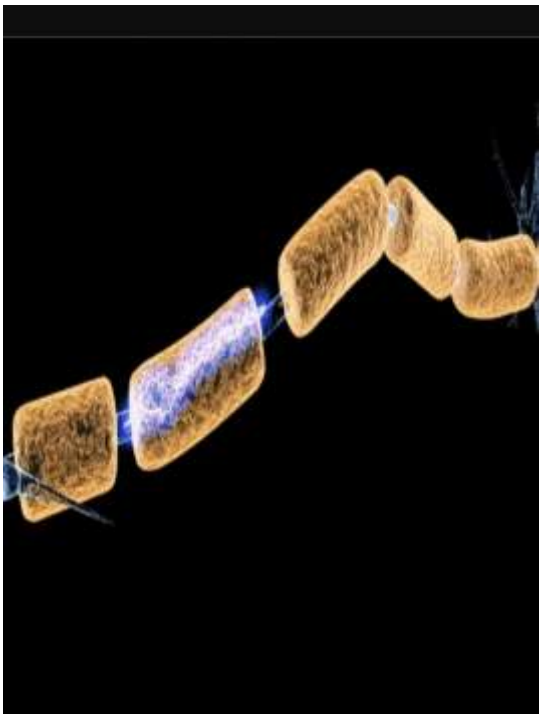

Diagram -2

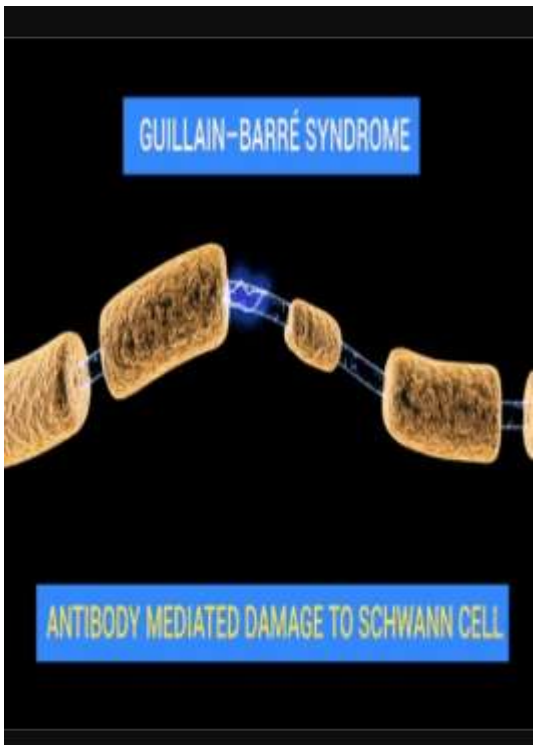

Diagram - 3

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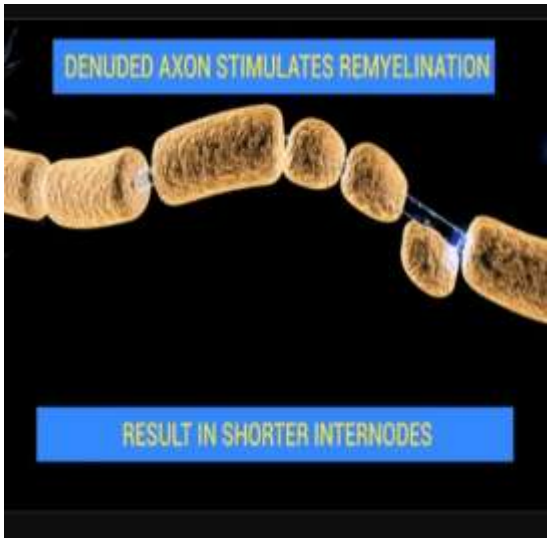

Diagram 4

The nerve dysfunction in Guillain–Barré syndrome is caused by an immune attack on the nerve cells of the peripheral nervous system and their support structures. The nerve cells have their body (the soma) in the spinal cord and a long projection (the axon) that carries electrical nerve impulses to the neuromuscular junction, where the impulse is transferred to the muscle. Axons are wrapped in a sheath of Schwann cells that contain myelin. Between Schwann cells are gaps (nodes of Ranvier) where the axon is exposed. Different types of Guillain–Barré syndrome feature different types of immune attack. The demyelinating variant (AIDP, see below) features damage to the myelin sheath by white blood cells (T lymphocytes and macrophages); this process is preceded by activation of a group of blood proteins known as complement. In contrast, the axonal variant is mediated by IgG antibodies and complement against the cell membrane covering the axon without direct lymphocyte involvement.

Various antibodies directed at nerve cells have been reported in Guillain–Barré syndrome. In the axonal subtype, these antibodies have been shown to bind to gangliosides, a group of substances found in peripheral nerves. A ganglioside is a molecule consisting of ceramide bound to a small group of hexose-type sugars and containing various numbers of N-acetylneuraminic acid groups. The key four gangliosides against which antibodies have been described are GM1, GD1a, GT1a, and GQ1b, with different anti-ganglioside antibodies being associated with particular features; for instance, GQ1b antibodies have been linked with Miller Fisher variant GBS and related forms including Bickerstaff encephalitis. The production of these antibodies after an infection probably is the result of molecular mimicry, where the immune system is reacting to microbial substances, but the resultant antibodies also react with substances occurring naturally in the body. After a Campylobacter infection, the body produces antibodies of the IgA class; only a small proportion of people also produce IgG antibodies against bacterial substance cell wall substances (e.g. lipooligosaccharides) that crossreact with human nerve cell gangliosides. It is not currently known how this process escapes central tolerance to gangliosides, which is meant to suppress the production of antibodies against the body's own substances Not all antiganglioside antibodies cause disease, and it has recently been suggested that some antibodies bind to more than one type of epitope simultaneously (heterodimeric binding) and that this determines the response. Furthermore, the development of pathogenic antibodies may depend on the presence of other strains of bacteria in the bowel.

6) Diagnosis of zika virus

Diagnosis of the Zika virus can only be confirmed by blood tests or other through body fluids, such as urine or semen.

A diagnosis of Zika virus infection can only be confirmed by laboratory tests of blood or other body fluids, such as urine or semen.

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7) What to do if you have Zika

1) There is no specific medicine or vaccine for Zika virus. Treat the symptoms:
2) Get plenty of rest.
3) Drink fluids to prevent dehydration.
4) Take medicine such as acetaminophen to reduce fever and pain.
5) Do not take aspirin or other non-steroidal anti-inflammatory drugs (NSAIDs).
6) If you are taking medicine for another medical condition, talk to your healthcare provider before taking additional medication

8)How to prevent Zika

There is no vaccine to prevent Zika. The best way to prevent diseases spread by mosquitoes is to protect yourself and your family from mosquito bites.

a) Clothing

1. Wear long-sleeved shirts and long pants.
2. Treat your clothing and gear with permethrin or buy pre-treated items.

b) Insect repellent

1) Use Environmental Protection Agency (EPA)-registered insect repellentsexternal icon with one of the following active ingredients:
2) DEET, picaridin, IR3535, oil of lemon eucalyptus or para-menthane-diol, or 2-undecanone. Always follow the product label instructions.
3) When used as directed, these insect repellents are proven safe and effective even for pregnant and breastfeeding women.
4) Do not use products containing oil of lemon eucalyptus or para-menthane-diol on children younger than 3 years old.

c) At Home

1) Stay in places with air conditioning and window and door screens to keep mosquitoes outside.

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2) Take steps to control mosquitoes inside and outside your home.
3) Mosquito netting can be used to cover babies younger than 2 months old in carriers, strollers, or cribs.
4) Sleep under a mosquito bed net if air conditioned or screened rooms are not available or if sleeping outdoors.

9) Zika Virus Cases

1) Kerala has reported 65 Zika virus cases as on August 2, 2021, Union Health Minister MansukhMandaviya informed the LokSabha on Friday.
2) Last week, a village in Purandar reported the first case of Zika virus infection in a 50-year-old woman.

II. CONCLUSION :

1) Advancing research in prevention, surveillance, and control of Zika virus infection and associated complications.
2) It will be helpful for global efforts to implement and monitor vector control strategies aimed at reducing Aedes mosquito populations.
3) Hopefully will be helpful for the near future studies

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