Prevention of the Adult Person of the Zika Virus

Mr. Manish K. Goyal
Assistant Professor,
Rama Nursing College, Pilkhuwa, Hapur (U.P.)

BACKGROUND:
Zika fever (also known as Zika virus disease) is an infectious disease caused by the Zika virus. Zika virus is a mosquito-borne flavivirus closely related to dengue virus. Zika virus is endemic in parts of Africa and Asia and was first identified in the South Pacific after an outbreak on Yap Island in the Federated States of Micronesia in 2007.¹

INTERODUCTION:
Zika fever (also known as Zika virus disease) is an infectious disease caused by the Zika virus. Most cases have no symptoms, but when present they are usually mild and can resemble dengue fever. Zika virus is an arthropod-borne flavivirus transmitted by mosquitoes. The virus is related to other flaviviruses including dengue virus, yellow fever virus, and West Nile virus. Zika virus is named after the Ugandan forest where it was first isolated from a rhesus monkey in 1947. The first human cases were detected in 1952 in Uganda and Tanzania. The virus subsequently spread across equatorial Africa and Asia, where it was associated with sporadic infections.²

Zika fever is mainly spread via the bite of mosquitoes of the Aedes type. It can also be sexually transmitted and potentially spread by blood transfusions. Infections in pregnant women can spread to the baby. Many people infected with Zika will have no symptoms or mild symptoms that last several days to a week. However, Clinical manifestations of Zika virus infection occur in approximately 20 percent of patients. Zika infection during pregnancy can cause a serious birth defect called microcephaly and other severe fetal brain defects. Current research suggests that Guillain-Barre syndrome (GBS), an uncommon sickness of the nervous system, is strongly associated with Zika; however, only a small proportion of people with recent Zika virus infection get GBS. There is no evidence that past Zika infection poses an increased risk of birth defects in future pregnancies.³

INCIDENCE:
The first major recognized outbreak occurred in the Yap Islands of Micronesia in 2007; more than 70 percent of the population ≥3 years of age was infected, resulting in an estimated 5000 infections among the total population of 6700. Another larger outbreak occurred in French Polynesia in 2013 to 2014, which affected about two-thirds of the population, resulting in approximately 32,000 infections. During the outbreak in French Polynesia, 3 percent of donated blood samples tested positive for Zika virus by polymerase chain reaction.⁴

During November 1, 2015–October 20, 2016, specimens from 62,500 patients with suspected Zika virus disease were evaluated by RT-PCR and/or MAC-ELISA; 28,341 (45%) were confirmed and 1,004 (2%) presumptive cases were identified. Among confirmed and presumptive Zika virus disease cases, 1,117 (4%) were in pregnant women. Among all confirmed and presumptive Zika virus disease cases, the median age was 32 years (range = 16 days–100 years) and 18,384 (63%) were female.⁵

Similar observations have been made in Bahia state (Brazil) and El Salvador, where, overall, the reported incidence of clinically suspected Zika virus disease cases was 75% higher in females than in males. In addition, rates of probable Zika virus disease cases in Bahia state and El Salvador were highest in women aged 20–49 years the same age group most highly affected in Puerto Rico.⁶

Zika virus has never been isolated in India. The only time any trace of the virus was recorded in India was in 1952-53. A study titled ‘Neutralising antibodies against certain viruses in the sera of the residents of India’, published in a journal called The Journal of Immunology, recorded among other viruses, antibodies to the Zika virus. The study, which went to 38 localities in six states in India, tested 15 vector borne viruses. “Significant numbers of the sera neutralised Zika,” noted the study authored by “KC Smithburn of the Rockefeller Foundation in New York, JA Karr, director, virus research centre in Poona and PB Gatne, Medical offer, Bombay State India.”⁷

Dr T Mourya, director, National Institute of Virology, Pune, said in an email response, “There have been no outbreaks in India but passive immunity has been traced in Indian samples in the
past. The last Indian study on this was conducted between 1952-53. So far, other than this, there are no reports on this virus in India. As of January 27, 2016, the list of affected countries includes Barbados, Bolivia, Brazil, Colombia, Dominican Republic, Ecuador, El Salvador, French Guiana, Guadeloupe, Guatemala, Guyana, Haiti, Honduras, Martinique, Mexico, Panama, Paraguay, Puerto Rico, Saint Martin, Suriname, U.S. Virgin Islands, Venezuela, Samoa and Cape Verde. This list may grow as additional laboratory-confirmed cases are reported in residents or in others who have traveled to Zika affected locations.8

TRANSMISSION :
Zika virus may be transmitted to humans via the following .

- Bite of an infected mosquito
- Maternal-fetal transmission
- Sex (including vaginal, anal, and oral sex)
- Blood product transfusion
- Organ transplantation
- Laboratory exposure

Zika virus RNA has been detected in blood, urine, semen, saliva, female genital tract secretions, cerebrospinal fluid, amniotic fluid, and breast milk. The incubation period is typically between 2 and 7 days.9

CLINICAL MANIFESTATION :
The most common symptoms of Zika are fever, rash, joint pain, or red eyes. Other symptoms include muscle pain, headache, pain behind the eyes, and vomiting. The illness is usually mild with symptoms lasting for several days to a week. Severe disease requiring hospitalization is uncommon.

- Fever
- Rash
- Headache
- Joint pain
- Conjunctivitis (red eyes)
- Muscle pain
- Dyscrasias
- Itch
- Shock

TEST :
- CDC recommends Zika virus testing for people who may have been exposed to Zika through sex if they also have Zika symptoms. Possible exposure to Zika virus from sex includes sex (oral, vaginal, or anal sex or the sharing of sex toys) without a condom with a partner who traveled to or lives in an area with Zika.

- A pregnant woman with possible exposure to Zika virus from sex should be tested even if she does not have symptoms.

- A blood or urine test can confirm Zika infection from sexual transmission; however, testing blood, semen, vaginal fluids, or urine is not recommended to determine how likely a person is to pass Zika virus through sex.

PREVENTION :
Currently there is no prevention for this virus causing disease. There are no anti-viral medications available although your own immune system is the best fighter for this virus. As is true of dengue and chikungunya, this virus requires a comprehensive approach involving several areas of action, from health, to education, to the environment. Mosquito repellents can be used to avoid getting bitten and wearing clothing that is covering your extremities is a big help. Eliminating mosquito-breeding sites is another key prevention measure. The mosquito bites in the day time and reduces its humming of the wings while it is approaching the target and it will often bite from beneath the arms.

There are several ways prevent Zika infection.

- First, avoid traveling and trip to countries that are currently experiencing an outbreak. “The greatest risk of Zika virus infection is among people exposed to mosquito bites in Zika-affected areas,” Amler said.

- If travel can’t be avoided, prevent mosquito bites to avert infection and take precautions, including use of repellents, wearing light-coloured and long-sleeved shirts.

- Avoided by local vector control. This is the prevention of mosquito breeding by eliminating standing water and applying larvicide and by taking personal measures.

- Minimize outdoor activity.

- Wear long clothing or permethrin-treated clothing including boots and socks,

- Sleep in enclosed and netted spaces.

- Using effective insect repellants such as 20 percent DEET (N,N-diethylmetatoluamide), picaridin, IR3535 or oil of lemon eucalyptus (OLE) to prevent mosquito bites.
“All EPA-registered insect repellants can be used safely by pregnant and breastfeeding women,” said Amler.

**Tips for Prevention**
- Reducing breeding of mosquitoes.
- Cutting contact between mosquitoes and people.
- Checking adult mosquito numbers.
- Using barriers like repellents, insect screens, closed doors and windows.

Space spraying of insecticides during outbreak recommended.
- Select accommodations with well-screened windows or air-conditioning when possible.

Reduce mosquito bites, especially during daylight hours.
  - Wear clothing that adequately covers the arms and legs, especially during the early morning and late afternoon.
- At least weekly empty or get rid of cans, buckets, old tires, pots, plant saucers and other containers that hold water.
- Keep gutters clear of debris and standing water.
- Remove standing water around structures and from flat roofs.
- Change water in pet dishes daily.
- Rinse and scrub vases and other indoor water containers weekly.
- Change water in wading pools and bird baths several times a week.
- Maintain backyard pools or hot tubs.
- Cover trash containers.
- Water lawns and gardens carefully so water does not stand for several days.
- Screen rain barrels and openings to water tanks or cisterns.
- Treat front and back door areas of homes with residual insecticides if mosquitoes are abundant nearby.
- If mosquito problems persist, consider pesticide applications for vegetation around the home.
- Zika purified inactivated virus (ZPIV) vaccine has started clinical trials to test safety and efficacy.

**Preventive Measures for Travellers**
Travellers should be advised to take measures to avoid being bitten by *Aedes* mosquitoes. No medications or vaccines are available to prevent a person from getting sick with Zika fever. Preventive measures are recommended by the US Centers for Disease Control and Prevention (CDC) and include the following:

- *Aedes* mosquitoes typically live indoors and are often found in dark, cool places such as in closets, under beds, behind curtains, and in bathrooms. A traveler should be advised to use insecticides to get rid of mosquitoes in these areas.

- Although there is no specific treatment for the disease, a doctor may be able to help treat your symptoms. Avoid getting any other mosquito bites, because if you are sick and a mosquito bites you, it can spread the disease to other people.

- Because of the "growing evidence of a link between Zika and microcephaly" the CDC issued a travel alert on January 15, 2016 advising pregnant women to consider postponing travel to the following countries and territories: Brazil, Colombia, El Salvador, French Guiana, Guatemala, Haiti, Honduras, Martinique, Mexico, Panama, Paraguay, Suriname, Venezuela, and the Commonwealth of Puerto Rico. The agency also suggested that women thinking about becoming pregnant should consult with their physicians before travelling.

- Neurotropism of Zika virus has been demonstrated in vivo and in vitro. Zika virus infection has been associated with neurologic complications; these include congenital microcephaly (in addition to other developmental problems among babies born to women infected during pregnancy), Guillain-Barré syndrome, myelitis, and meningoencephalitis.

- A high rate of the autoimmune disease Guillain–Barré syndrome (GBS), noted in the French Polynesia outbreak, has also been found in the outbreak that began in Brazil. Laboratory analysis found Zika infections in some patients with GBS in Brazil, El Salvador, Suriname and Venezuela, and the WHO declared on 22 March 2016 that Zika appeared to be “implicated” in GBS infection and that if the pattern was confirmed it would represent a global public health crisis.

**SUMMARY** : Zika virus is a flavivirus from the same family as dengue virus and West Nile virus. Infection in humans was rare and isolated to Africa and Asia until 2007. Transmission of Zika virus is via the Aedes mosquito, which is found in tropical, subtropical, and some temperate regions. There have also been rare accounts of transmission by sexual contact and through blood transfusion in...
countries outside of Canada. Guillain-Barre syndrome and other neurologic disorders are strongly associated with, and suspected to be caused by, Zika virus, but the link is unproven and studies are ongoing, including to elucidate a possible mechanism. Treatment of symptomatic infection is supportive and there are no specific antiviral therapies at this time.

**CONCLUSION:** The Zika virus is a mosquito borne flavivirus that was first discovered in a rhesus monkey in Uganda during the year 1947. This virus is part of the flavivirus genus of which there are a total of 52 other species that are closely related such as Dengue Fever Virus, West Nile Virus, and Japanese Encephalitis Virus. The Flavivirus virions are tiny sphere shaped particles that are single-stranded, positive sense with an approximate length of 11kb. “The genomic RNA has one open reading frame (ORF) that is flanked by 5’ and 3’ non-coding regions”.

**REFERENCE:**