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Review

Zika Virus: A threat to global Public health- WHO Faramework Review

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ABSTRACT

Zika virus is an emerging mosquito-borne virus that was first identified in Uganda in 1947 in rhesus monkeys through a monitoring network of sylvatic yellow fever. Background Zika virus is an emerging viral disease that is transmitted through the bite of an infected mosquito, primarily Aedes aegypti, the same vector that transmits chikungunya, dengue and yellow fever. Zika has a similar epidemiology, clinical presentation and transmission cycle in urban environments as chikungunya and dengue, although it generally causes milder illness. Symptoms of Zika virus disease include fever, skin rash, conjunctivitis, muscle and joint pain, malaise and headache, which normally last for 2 to 7 days. National health authorities have reported an observed increase of Guillain-Barré syndrome (GBS) and microcephaly. Today the Brazilian national authorities estimate 500,000 to 1,500,000 cases of Zika virus disease. In October 2015, both Colombia and Cape Verde, off the coast of Africa, reported their first outbreaks of the virus. As of 22 January 2016 Colombia had reported 16,419 cases, El Salvador 3,836 cases and Panama 99 cases of Zika virus disease. As of 12 February, a total of 39 countries in multiple regions have reported autochthonous (local) circulation of Zika virus, and there is evidence of local transmission in six additional countries**.** As per the health authorities India has not reported any case of Zika Virus. Health Authorities in India is taking adequate precaution to keep Zika Virus outside the India**.**

Key Words: zika virus, neurological syndrome, congenital malformalities

INTRODUCTION

Zika virus is an emerging mosquito-borne virus that was first identified in Uganda in 1947 in rhesus monkeys through a monitoring network of sylvatic yellow fever. It was subsequently identified in humans in 1952 in Uganda and the United Republic of Tanzania. Outbreaks of Zika virus disease have been recorded in Africa, the Americas, Asia and the Pacific.

Genre: Flavivirus

Vector: Aedes mosquitoes (which usually bite during the morning and late afternoon/evening hours)

Background:

Background Zika virus is an emerging viral disease that is transmitted through the bite of an infected mosquito, primarily Aedes aegypti, the same vector that transmits chikungunya, dengue and yellow fever. Zika has a similar epidemiology, clinical presentation and transmission cycle in urban environments as chikungunya and dengue, although it generally causes milder illness.

Symptoms of Zika virus disease include fever, skin rash, conjunctivitis, muscle and joint pain, malaise and headache, which normally last for 2 to 7 days. There is no specific treatment but symptoms are normally mild and can be treated with common pain and fever medicines, rest and drinking plenty of fluids.

Zika virus was first identified in 1947 in a monkey in the Zika forest of Uganda, and was first isolated in humans in 1952 in Uganda and the United Republic of Tanzania. Zika virus has been causing sporadic disease in Africa and Asia. Outbreaks were reported for the first time from the Pacific in 2007 and 2013 in Yap Island (Federated States of Micronesia) and French Polynesia, respectively. There was subsequent spread of the virus to other Pacific islands, including New Caledonia, Cook Islands, Easter Island (Chile), Fiji, Samoa, Solomon Islands and Vanuatu. The geographical range of Zika virus has been steadily increasing ever since (Table 1).

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Current Situation:

Current Situation in February 2015, Brazil detected cases of fever and rash that were confirmed to be Zika virus in May 2015. The last official report received dated 1 December 2015, indicated 56,318 suspected cases of Zika virus disease in 29 States, with localized transmission occurring since April 2015. Due to the magnitude of the outbreak, Brazil has stopped counting cases of Zika virus. Today the Brazilian national authorities estimate 500,000 to 1,500,000 cases of Zika virus disease. In October 2015, both Colombia and Cape Verde, off the coast of Africa, reported their first outbreaks of the virus. As of 22 January 2016 Colombia had reported 16,419 cases, El Salvador 3,836 cases and Panama 99 cases of Zika virus disease. As of 12 February, a total of 39 countries in multiple regions have reported autochthonous (local) circulation of Zika virus, and there is evidence of local transmission in six additional countries (Table 1). Imported cases have been reported in the United States of America, Europe and non-endemic countries of Asia and the Pacific.

Increase in neurological syndromes:

National health authorities have reported an observed increase of Guillain-Barré syndrome (GBS)1 in Brazil and El Salvador which coincided with the Zika virus outbreaks. During the French Polynesia outbreak in 2013/2014, national authorities also reported an observed increase in neurological syndromes in the context of co-circulating dengue virus and Zika virus. Seventy-four patients presented with neurological or auto-immune syndromes after the manifestation of symptoms consistent with Zika virus infection. Of these, 42 were classified as GBS.

On January 22 Brazil reported an increase of GBS at the national level. A total of 1708 GBS cases were registered between January and November 2015. Most of Brazil's states have Zika, chikungunya and dengue virus circulation.

(Guillain-Barré syndrome is a rare condition in which a person's immune system attacks their peripheral nervous system. The syndrome can affect the nerves that control muscle movement as well as those that transmit feelings of pain, temperature and touch. This can result in muscle weakness and loss of sensation in the legs and/or arms. The cause of Guillain-Barré cannot always be determined, but it is often triggered by an infection (such as HIV, dengue, or influenza) and less commonly by immunization, surgery, or trauma.)

Table 1: Countries affected

Year	Country
1947-1952	Uganda United Republic of Tanzania
1954	Nigeria
1960-1983	Central African republic Senegal, Pakistan, Burkina Faso, Cote D'Ivoire, Cameroon, Sierra Leone, Gabon, Indonesia, Malaysia, Nigeria, Costa Rica, Cambodia
2007-2009	YAP (Micronesia federal state of Gaban)
2012-2014	French Polynesia, Easter Island (Chile), Cook Island, New Caledonia, Malaysia, Philippines, Cambodia, Indonesia, Thailand
Jan-Oct 2015	Brazil, Vanuatu, Fiji, Colombia, Cabo Verde, Samoa, Solomon Island
Nov 2015	El Salvador, Guatemala, Mexico, Paraguay, Suriname, Venezuela
Dec 2015	French Guiana, Honduras, Martinique, Panama, Puerto Rico
Jan 2016	United states virgin, Islands, Dominican Republic, Costa Rica, Guadeloupe, Saint Martin, Nicaragua, Barbados, Maldives, Ecuador, Guyana, Jamaica, Curacao, Samoa, Haiti
Feb 2016	Tonga

Increase in congenital malformations:

On 27 January 2016, Brazil reported that of 4180 suspected cases of microcephaly, 270 were confirmed, 462 were discarded and 3448 are still under investigation.

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This compares to an average of 163 microcephaly cases recorded nationwide per year. Only six of the 270 confirmed cases of microcephaly had evidence of Zika infection. According to the US Centers for Disease Control and Prevention (US CDC) and Ministry of Health Brazil, the results of two specimens taken during autopsy from the brain tissues of microcephalic patients, indicated infection with Zika virus. A placenta was also evaluated and found to be PCR positive for Zika.

Although the microcephaly cases in Brazil are spatio-temporally associated with the Zika virus outbreak, health authorities and agencies are investigating and conducting comprehensive research to confirm a causal link.

Following the Zika outbreak in French Polynesian, health authorities reported an unusual increase in the number of congenital malformations in babies born between March 2014 and May 2015. Eighteen cases were reported, nine of which were diagnosed as microcephaly.

Other countries with current outbreaks (Cape Verde, Colombia, El Salvador and Panama) have not reported an increase in microcephaly.

Signs and Symptoms:

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.

Potential complications of Zika virus disease:

During large outbreaks in French Polynesia and Brazil in 2013 and 2015 respectively, national health authorities reported potential neurological and auto-immune complications of Zika virus disease. Recently in Brazil, local health authorities have observed an increase in Guillain-Barré syndrome which coincided with Zika virus infections in the general public, as well as an increase in babies born with microcephaly in northeast Brazil. Agencies investigating the Zika outbreaks are finding an increasing body of evidence about the link between Zika virus and microcephaly. However, more investigation is needed to better understand the relationship between microcephaly in babies and the Zika virus. Other potential causes are also being investigated.

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. 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 (Cabo Verde). In addition, more than 13 countries in the Americas have reported sporadic Zika virus infections indicating rapid geographic expansion of Zika virus.

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.

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. If symptoms worsen, they should seek medical care and advice. There is currently no vaccine available.

Key facts:
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.

WHO response:
WHO is supporting countries to control Zika virus disease through:
Define and prioritize research into Zika virus disease by convening experts and partners.
Enhance surveillance of Zika virus and potential complications.
Strengthen capacity in risk communication to help countries meet their commitments under the International Health Regulations.
Provide training on clinical management, diagnosis and vector control including through a number of WHO Collaborating Centres.
Strengthen the capacity of laboratories to detect the virus.
Support health authorities to implement vector control strategies aimed at reducing Aedes mosquito populations such as providing larvicide to treat standing water sites that cannot be treated in other ways, such as cleaning, emptying, and covering them.
Prepare recommendations for clinical care and follow-up of people with Zika virus, in collaboration with experts and other health agencies.

Conclusion:
As per the health authorities India has not reported any case of Zika Virus. Health Authorities in India is taking adequate precaution to keep Zika Virus outside the india. community in India should cooperate to the local health authority and follow the proper sanitation rule 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. These precaution will keep Zika Virus outside the India.

Reference:
strategic response framework and joint operations plan, World Health Organanisation, Jan- Jun 2016. Available on http://www.who.int/emergencies/zika-virus/en/