Factsheet for health professionals

INTRODUCTION

Zika virus disease is a mosquito-borne disease caused by Zika virus (ZIKV) which causes in general a mild febrile illness with maculo-papular rash. *Aedes* mosquitoes are considered as main vectors. Before 2007, viral circulation and a few outbreaks were documented in tropical Africa and in some areas in Southeast Asia. Since 2007, several islands of the Pacific region have experienced outbreaks. In 2015, ZIKV disease outbreaks were reported in South America for the first time. ZIKV disease is now considered as an emerging infectious disease.

A significant increase of patients with Guillain–Barré syndrome (GBS) was reported during the 2014 outbreak in French Polynesia. A similar increase along with an unusual increase of congenital microcephaly was observed in some regions in north eastern Brazil in 2015. Causal relationships are currently under investigation.

There is no prophylaxis, treatment or vaccine to protect against ZIKV infection. Therefore, preventive personal measures are recommended to avoid mosquito bites during the daytime.

THE PATHOGEN

- Zika virus (ZIKV) disease is caused by a virus from the *Flavivirus* genus, Flaviviridae family, from the Spondweni group.
- It was first isolated in 1947 from a monkey in the Zika forest, Uganda, then in mosquitoes (*Aedes africanus*) in the same forest in 1948, and in a human in Nigeria in 1952. There are two ZIKV lineages: the African lineage and the Asian lineage which has recently emerged in the Pacific and the Americas. [1,2]

CLINICAL FEATURES AND SEQUELAE

- The incubation period ranges between approximately three to 12 days after the bite of an infected mosquito.
- Most of the infections remain asymptomatic (between 60 to 80%).
- Disease symptoms are usually mild and the disease in usually characterised by a short-lasting self-limiting febrile illness of 4–7 days duration without severe complications, with no associated fatalities and a low hospitalisation rate.
- The main symptoms are macular or papular rash, fever, arthralgia, non-purulent conjunctivitis/conjunctival hyperaemia, myalgia and headache. The maculo-papular rash often starts on the face and then spreads throughout the body. Less frequently, retro-orbital pain and gastro-intestinal signs are present.

Auto-immune, neurological and neurodevelopmental conditions such as Guillain-Barré syndrome and microcephaly in foetuses and newborns from mothers possibly exposed to ZIKV in the two first trimesters of the pregnancy were notified during recent Zika disease outbreaks (French Polynesia and Brazil). Further evidence is needed to establish a causal link between these neurological/neurodevelopmental impairments and infections with ZIKV.

EPIDEMIOLOGY

- Serological surveys in Africa and Asia indicate a most likely silent ZIKV circulation with detection of specific antibodies in various animal species (large mammals such as orangutans, zebra, elephants, water buffaloes) and rodents.

- The knowledge of geographical distribution of ZIKV is based on results of serosurveys and viral isolation in mosquitoes and humans, and with reports of travel-associated cases and very few published outbreaks. Before 2007, the areas with reported ZIKV circulation included tropical Africa and Southeast Asia.
- An outbreak was reported on Yap Island, Federated States of Micronesia (FSM) from April to July 2007 [3]. This was the first outbreak of ZIKV identified outside of Africa and Asia. Between 2013 and 2015, several significant outbreaks were notified on islands and archipelagos from the Pacific region including a large outbreak in French Polynesia. In 2015, ZIKV emerged in South America with widespread outbreaks reported in Brazil and Columbia

TRANSMISSION

- Zika virus is transmitted by mosquitoes. It has been isolated from *Aedes aegypti* mosquitoes and experimental infections show that this species is capable of transmitting ZIKV.
- Other *Aedes* mosquito species (notably *Ae. africanus*, *Ae. albopictus*, *Ae. polynesiensis*, *Ae. unilineatus, Ae. vittatus* and *Ae. hensilli*) are considered as potential vectors of ZIKV. These species bite during the day (especially in mid-morning and between late afternoon and twilight).
- Additional modes of transmission have been identified. Perinatal transmission can occur most probably by trans-placental transmission or during delivery when the mother is infected. Sexual transmission was reported in two case reports.
- There is a potential risk of ZIKV transfusion-derived transmission.

DIAGNOSTICS

- ZIKV disease diagnostics is primarily based on detection of viral RNA from clinical specimens in acutely ill patients.
- The viraemic period appears to be short, allowing for direct virus detection during the first 3–5 days after the onset of symptoms. ZIKV RNA has been detected in urine up to 10 days after onset of the disease.
- From day five post onset of fever, serological investigations can be conducted by detection of Zika-specific IgM antibodies and confirmation by neutralisation, seroconversion or four-fold antibody titer increase of Zika specific antibodies in paired serum samples.
- Serological results should be interpreted according to the vaccination status and previous exposure to other flaviviral infections.

CASE MANAGEMENT AND TREATMENT

- There is no vaccine or preventive drug.
- Differential clinical diagnostic should be considered as well as co-infection with other mosquito-borne diseases such as dengue fever, chikungunya and malaria.
- The treatment is symptomatic and mainly based on pain relief, fever reduction and anti-histamines for pruritic rash.
- Treatment with acetylsalicylic acid and no-steroidal anti-inflammatory drugs was discouraged because of a potential increased risk of haemorrhagic syndrome reported with other flaviviruses as well as the risk of Reye's syndrome after viral infection in children and teenagers.

PUBLIC HEALTH CONTROL MEASURES

- No vaccine or prophylactic drug is available.
- Integrated vector management program aiming to reduce mosquito vector density in a sustainable manner is of primary importance. Intersectoral collaboration and efficient public communication strategy to ensure community participation are required for sustainable vector control program.
- Activities supporting the reduction of mosquito breeding sites in outdoor/indoor areas by draining or discarding sources of standing water at the community level include:
- removal of all open containers with stagnant water in and surrounding houses on a regular basis (flower plates and pots, used tyres, tree-holes and rock pools), or, if that is not possible, treatment with larvicides),
- tight coverage of water containers, barrels, wells and water storage tanks,
- wide use of window/door screens by the population.
- Measures aiming to control larvae and adult mosquito vector population can be applied in an outbreak situation.
- In affected outbreak areas, elimination of adult mosquitoes through aerial spraying with insecticides can be considered.

INFECTION CONTROL, PERSONAL PROTECTION AND PREVENTION

- Prevention is also based on protection against mosquito bites. *Aedes* mosquitoes have diurnal biting activities in both indoor and outdoor environments. Therefore personal protection measures should be applied all day long and especially during the hours of highest mosquito activity (mid-morning, late afternoon to twilight).
- Personal protection measures to avoid mosquito bites should be applied when staying in risk areas by:
- using repellents and wearing long-sleeved shirts and long pants especially during the hours of highest mosquito activity,
- using long-lasting insecticidal treated mosquito bed nets which are essential in providing protection from mosquitos bites if the accommodations are not adequately screened or air conditioned,
- removing mosquito breeding sites in close outdoor/indoor premises.
- Repellent use must be strictly done in accordance with the instructions indicated on the product label. For newborn children under three months of age, repellents are not recommended.
- Travellers, especially children, pregnant women, and people with immune disorders or severe chronic illnesses, should consult their doctor or seek advice from a travel clinic to receive personalised recommendations on use of repellents and protection before travelling;
- Similar protective measures apply to a symptomatic patient in order to prevent transmitting the disease to non-infected mosquitoes.