Epidemiological Update

Zika virus infection
16 October 2015

Given the increased transmission of Zika virus in the Region of the Americas, the Pan American Health Organization/World Health Organization (PAHO/WHO) recommends that its Member States establish and maintain the capacity to detect and confirm cases of Zika virus infection, prepare their health services for a potential additional burden at all levels of health care, and implement an effective public communications strategy to reduce the mosquitoes that transmit this disease, particularly in areas where this vector is present.

Situation summary

Since 2014, indigenous circulation of Zika virus (ZIKV) has been detected in the Americas. In February 2014, the public health authorities of Chile confirmed the first case of indigenous transmission of Zika virus infection on Easter Island (Chile)[1], and cases were reported until June 2014.

In May 2015, the public health authorities of Brazil confirmed autochthonous transmission of Zika virus in the northeastern part of the country. As of October of this year, 14 states had confirmed autochthonous virus transmission: Alagoas, Bahia, Ceará, Maranhão, Mato Grosso, Pará, Paraíba, Paraná, Pernambuco, Piauí, Rio de Janeiro, Rio Grande do Norte, Roraima, and São Paulo.

Recently, Colombia health authorities reported the detection of the first autochthonous case of Zika virus infection in the state of Bolívar[2].

Recent outbreaks of Zika virus fever in different regions of the world demonstrate the potential for the arbovirus to spread through territories where the (*Aedes*) vector is found.

Recommendations

Considering its expanded transmission in the Region of the Americas, and since the mosquito vector is present in several countries of the Region, PAHO/WHO is updating the recommendations regarding surveillance. PAHO/WHO also reinforces its previous recommendations on vector-borne diseases, and urges the Member States where the *Aedes* mosquito is circulating to continue their efforts to implement an effective public communications strategy aimed at reducing vector density.

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[1]Information available at: http://web.minsal.cl/node/794

[2] Information available at: https://www.minsalud.gov.co/Paginas/Confirmados-primeros-casos-de-virus-del-zika-en-Colombia.aspx

Recommendations regarding surveillance, clinical case management, and prevention and control measures will be reviewed and updated as new information about the disease becomes available.

Surveillance

Zika fever surveillance should be set up based on the existing surveillance system for dengue and chikungunya, while taking the differences in clinical presentation into account. As appropriate for the epidemiological situation, surveillance should be focused to (i) determine if the Zika virus has been introduced to an area, (ii) monitor the spread of Zika virus fever once it is introduced, and (iii) monitor for neurological and autoimmune complications[3].

In countries **without** autochthonous transmission of Zika virus infection, they are recommended to:

- Strengthen event-based surveillance to detect the first cases. Based on the experiences of Brazil and Colombia, health authorities must be on alert for the emergence of clusters of rash febrile syndrome of unknown etiology (in which dengue, chikungunya, measles, rubella, and parvovirus B19 have been ruled out), and test for Zika virus infection

In countries **with** autochthonous transmission of Zika virus infection, they are recommended to:

- Monitor the trend and geographical spread of the virus to detect the introduction into new areas;
- Monitor potential neurological and autoimmune complications, as well as the impact on public health;
- Identify risk factors associated with Zika virus infection, and when the capacity exists,
- Identify circulating Zika virus lineages.

These efforts will be the basis for developing and maintaining effective control measures. Once the introduction of the virus is documented, ongoing surveillance should be maintained in order to monitor epidemiological and entomological changes that may affect the transmission of Zika virus. Any changes detected by the surveillance system should be promptly communicated to the national authorities in order to ensure timely decisions for actions as warranted.

Below is a provisional[4] case definition for Zika virus infection.

Suspected case: Patient with rash or elevated body temperature (> 37.2 °C) with one or more of the following symptoms (not explained by other medical conditions):

- Arthralgia or myalgia
- Non-purulent conjuntivitis or conjunctival hyperemia
- Headache or malaise

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[3]As during some Zika virus and dengue outbreaks there have been reports of neurological and autoimmune complications, Member States are recommended, particularly in situations of possible ZIKV circulation, to establish or strengthen surveillance of neurological syndromes, of all age groups. This surveillance of neurological syndromes will contribute in establishing the possible relationship between neurological complications, Zika virus infection and previous infection with other agents.

[4] This case definition is based on the definition used during the outbreak in French Polynesia, 2013-2014 *(Direction de la Santé BdVs, Polynesie Francaise. Surveillance de la dengue et du zika en Polynésie Française, 2013-2014*. Available in: http://www.hygiene-publique.gov.pf/spip.php?article120) The case definition has been adapted according to the clinical description available after the introduction of the Zika virus in the Region of the Americas and may be subject to further modifications as new knowledge and information on the disease and the etiological agent is available.

Confirmed case: A suspected case with laboratory positive result for the specific detection of Zika virus (see algorithm for laboratory diagnosis)[5]

International reporting

Given the recent introduction of Zika virus in the Americas and to contribute to integrated arbovirus surveillance, national public health authorities are encouraged to inform PAHO/WHO through the established International Health Regulations (IHR) channels, any laboratory-confirmed cases of Zika virus infection that are registered in the countries and territories of the Region of the Americas.

Laboratory detection

During the first 5 days after the onset of clinical picture, (acute phase, viremic period) viral Ribonucleic Acid (RNA) can be detected in serum by molecular techniques (conventional or real-time RT-PCR). The reverse transcription-polymerase chain reaction (RT-PCR) for dengue as the main differential diagnosis should be negative. In addition, a generic assay against flavivirus followed by genetic sequencing can be used to establish the specific etiology.

For a case clinically suggestive of infection and where dengue has been discarded, further tests for other flaviviruses, including Zika virus, should be performed.

The serological tests (ELISA or inmunofluerescence) to detect specific IgM or IgG against Zika virus can be positive after 5 to 6 days following the onset of symptoms. It must demonstrate an increased antibody titer in paired samples, with an interval of about two weeks. However, confirmation of positive results with plaque reduction neutralization test (PRNT) showing at least a four-fold increase in the titer of neutralizing antibodies to Zika virus is recommended. There can be cross-reactivity with other flaviviruses, especially dengue and yellow fever or, less frequently, with West Nile virus. Hence, a fourfold rise or more of the neutralizing antibody titer against dengue in a patient infected with Zika virus, particularly if the patient previously had dengue, could be detected. Given this cross-reactivity between flavivirus serology results should be interpreted with caution.

Case management

There is no specific antiviral treatment for Zika virus. Symptomatic treatment after excluding more severe conditions such as malaria, dengue, and bacterial infection is recommended.

It is important to differentiate Zika virus infection from dengue due to severe clinical outcomes in some dengue cases. In addition, cases of co-infection, Zika and dengue, could occur. Compared with dengue, Zika virus infection has a mild to moderate clinical picture, the onset of fever is more acute and shorter in duration, and no shock or severe bleeding has been observed.

Because Zika virus outbreaks could cause additional burdens on all levels of the health care system, it is necessary to develop and implement protocols and well established plans for the patient screening and treatment.

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[5] Available at:
http://www.paho.org/hq/index.php?option=com_docman&task=doc_download&Itemid=&gid=30176&lang=en

Treatment

- There is no vaccine or specific treatment for Zika virus infection. Therefore, treatment is geared toward relieving symptoms.

- Treatment is symptomatic and supportive, including rest and the use of acetaminophen or paracetamol to relieve fever. The use of antihistamines to control pruritus usually associated with the maculo-papular rash could be recommended.

- Using aspirin is not advised due to the risk of bleeding and developing Reye's syndrome in children younger than 12 years of age. The use of other nonsteroidal anti-inflammatory drugs is not advised either, since the cause of the clinical symptoms could be dengue or chikungunya, pathologies in which the use of Non-steroidal Anti-inflammatory Drugs (NSAIDs) is contraindicated.

- Patients should be advised to drink plenty of fluids to replenish fluid lost from sweating, vomiting and other insensible losses.

Patient isolation

To prevent infection of other persons, a Zika virus-infected patient should avoid being bitten by *Aedes* mosquitoes during the first week of illness (viremic phase). The patient is recommended to stay under a bed net (treated or without insecticide), or stay in a place with intact window/door screens. In addition, physicians or health care workers who attend to Zika virus-infected patients should protect against mosquito bites by using insect repellent (IR3535 or Icaridin) and wearing long sleeves and pants.

Prevention and control measures

Prevention and control measures directed at the reduction of vector density are fundamental and can prevent transmission if effective.

The Integrated Management Strategy for the Prevention and Control of Dengue (IMS – Dengue) provides the basis for preparedness for Zika virus. In the current situation, the intensification of comprehensive prevention and control of IMS-dengue is recommended. These recommendations include:

- Intersectoral participation and collaboration at all levels of government and health, education, environment, social development and tourism sectors.

- Participation of non-governmental organizations (NGOs) and private organizations; Maintain risk communication and mobilization for the whole community.

Mosquito control is the only measure that can interrupt the transmission of vector borne viruses such as dengue, chikungunya, and Zika. The key elements of the vector control program that should guide the response are listed below.

Integrated Vector Management (IVM)

An effective and operational dengue and chikungunya vector control program provides the basis for adequate preparation against Zika virus, because these viruses are transmitted by the same mosquito, *Ae. Aegypti*. Therefore, it is recommended to apply and intensify the surveillance and vector control measures developed for dengue and chikungunya as part of the Integrated Vector Management (IVM).

To ensure its success, it is essential to include intersectoral participation and collaboration at all levels of government, including health, education, environment, social, development and tourism sectors, among others. IVM also relies on support of non-governmental organizations (NGOs) and private organizations. Communication channels must remain open and community participation should be mobilized. It is important to provide clear and quality information to the public about these diseases via communication campaigns.

Given the broad distribution of *Ae. aegypti* and *Ae. albopictus* in the Americas, prevention and control measures should be aimed at reducing vector density, and obtaining the acceptance and collaboration of communities to adopt such measures.

Prevention and control measures by national authorities should include the following:

- Strengthening environmental management and eliminating vector breeding sites in household and common areas (e.g., parks, schools, cemeteries, etc.) to prevent or minimize vector propagation and human contact with the vector-mosquito

- Organizing mass sanitation campaigns for the elimination of breeding sites, specifically in areas where routine garbage collection has been interrupted

- Implementing breeding site control measures through physical, biological and chemical methods while actively involving families and communities

- Identifying areas of high risk of transmission (risk stratification), and prioritizing places where people gather (e.g., schools, transport terminals, hospitals, health centers, etc.) Mosquitoes should be removed with a radius of at least 400 meter around these places.

- In areas where autochthonous or imported cases of dengue, chikungunya, and/or Zika virus are detected, it is suggested to use adulticide treatment (primarily through spraying), to remove infected adult mosquitoes and interrupt transmission. It is important to take into account that this action is exceptional and is only effective when executed by adequately trained personnel following internationally accepted technical guidelines and when carried out together with other proposed actions, as described above. Spraying is the primary manner to intensively interrupt transmission and obtain time to consolidate the removal of larval breeding sites.

- Selecting appropriate insecticide (in accordance with PAHO/WHO recommendations), verifying the product label and formula, and considering the susceptibility of mosquito populations to that insecticide

- Maintaining and using spraying equipment in an appropriate manner and maintaining a stockpile of insecticides

- Ensuring intensified monitoring (e.g., quality control) of fieldwork operators both during larval control and adult insecticide treatment (fumigation)

Integrated (simultaneous or coordinated) actions for vector control (e.g., adulticide and larval control by trained personnel, coupled with sanitation and the promotion of community actions) are essential to achieve the greatest impact in the shortest amount of time.

It is crucial that the personnel involved in the chemical control of vector control use, without exception, the appropriate personal protective equipment. It is the responsibility of vector control programs to supply this equipment to its staff, to monitor its use, and to have enough stockpile stored under appropriate conditions.

Personal prevention measures

It is important for patients infected with dengue, chikungunya or Zika virus to minimize contact with the vector. This measure helps prevent the spread of the virus and therefore the disease. Patients, their household members, and the community, must be educated about the risk of transmission to others and the ways to minimize this risk by reducing vector population and human-vector contact.

The following actions are recommended to minimize vector-patient contact:

- Patients should rest under mosquito nets (bed nets), treated with or without insecticide.
- Patients and other members of the household should wear clothes that cover the extremities.
- Apply repellents containing DEET, IR3535 or Icaridin to exposed skin or clothing; its use must be strictly in accordance with the instructions indicated on the product label.
- Use wire-mesh screens on doors and windows.

These personal prevention measures are also effective in preventing transmission of the virus to healthy people.

Travelers

Prior to departure

Health authorities should advise travelers heading to any country with documented circulation of dengue, chikungunya, and/or Zika virus to take the necessary measures to protect themselves from mosquito bites, such as using repellents, wearing appropriate clothing that minimize skin exposure, and using insecticides or nets. It is also important to inform travelers of the symptoms of dengue, chikungunya, and Zika virus, in order for them identify it promptly during their trip. This advice could be relayed through travel medicine services, clinics, travel health web pages of the Ministry of Health or other relevant government web pages.

While visiting places with dengue, chikungunya and/or Zika virus transmission

Travelers are advised to:

- Take appropriate measures to protect themselves from mosquito bites by using repellents or wearing appropriate clothes that minimize skin exposure
- Avoid mosquito-infested areas
- Use nets and/or insecticide
- Recognize symptoms of dengue, chikungunya, and Zika virus, and seek professional health care if any of these symptoms occur

Upon returning from places with dengue, chikungunya and/or Zika virus transmission

Travelers are advised to contact their healthcare provider if they suspect they have dengue, chikungunya, or Zika virus upon returning home.

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