Managing screening and diagnosis of Zika in the Emergency Department

Lila de Tantillo, Juan M. Gonzalez and Johis Ortega

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Abstract

Zika has emerged as a rapidly spreading infection worldwide. Clinicians in many parts of the world must be prepared to screen for symptoms and diagnose patients with this disease. In particular, pregnant women who may have experienced exposure to Zika must be treated with care and sensitivity due to serious risk for pregnancy complications among those who contract the infection. In response to the outbreak, patient management guidelines have been established for all who may be symptomatic or potentially at risk of infection with Zika. Clinicians globally can prepare to implement such protocols to help contain this disease.

Keywords

Zika, infection control, microcephaly, tropical disease, pregnancy, infectious diseases, outbreak

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International scope of epidemic

Zika is swiftly emerging as public health threat worldwide and has been declared a global emergency by the World Health Organization (WHO). Since 2015, evidence of mosquito-borne transmission has been identified in 69 countries and territories around the globe (World Health Organization, 2016a). Of particular concern, well over 2200 births with microcephaly or central nervous system malformations suggestive of congenital Zika infection have been reported in 26 countries (World Health Organization, 2016a). At this time, the greatest risk areas for Zika are primarily concentrated in the Americas and the Western Pacific (Public Health England, 2016). High-risk countries and territories—defined as those within the main outbreak regions that have reported Zika transmission within the past three months—include much of South America such as Brazil and Argentina, virtually all of the Caribbean and Central America, South Florida in the United States, Cape Verde, and vast swaths of Southeast Asia and the Pacific Rim including Thailand, Fiji, Samoa and Singapore. Additionally, a recent modelling study indicated that as the virus continues to spread worldwide, many of those living in Africa and Asia could be particularly vulnerable to exposure (Bogoch et al., 2016).

The Zika virus poses a unique challenge to the health-care system—and the discernment of healthcare workers

around the world—because of its multiple modes of transmission. The mosquito-borne mode of transmission is considered the primary route of infection and has prompted the concentration of cases thus far in regions with warm climates and the presence of the *Aedes* mosquito (World Health Organization, 2016b). However, the potential for the virus to spread via sexual contact means that a Zika patient requiring care might found anywhere in the world. It is essential for clinicians globally to be prepared to identify the symptoms of Zika patients and provide appropriate management and guidance on infection control practices. In this context, emergency room providers and other front-line personnel should become familiarised with screening, testing and diagnosing protocols for Zika to provide quality care for patients and help protect the public from further spread of this emerging health threat.

University of Miami School of Nursing and Health Studies, Coral Gables, FL, USA

Corresponding author:

Lila de Tantillo, University of Miami School of Nursing and Health Studies, 5030 Brunson Drive Coral Gables, FL 33146, USA.
Email: l.detantillo@umiami.edu

Presentation

Because symptoms are usually mild or non-existent in most infected individuals, those infected with Zika frequently do not seek medical care. Health professionals, especially those in emergency room settings, should be attuned to the potential for Zika in order to assess patients thoroughly and screen appropriately if warranted. One recommended protocol is for all patients to be asked upon entry to the health facility regarding travel to regions with active Zika transmission during the three weeks prior to illness onset (U.S. Department of Health and Human Services, 2016a).

In those patients with symptoms, Zika may be suspected in patients with acute fever (often low-grade, 37.4–38.0°C), conjunctivitis and rash (Florida Department of Health, 2016; Plourde and Bloch, 2016). If present, the rash consists of maculopapular vesicles and presents on the face and/or upper trunk. Other symptoms include retro-orbital pain, vomiting, headache, myalgia and arthralgia. Nurses, physicians and other healthcare personnel who identify patients with symptomatology meeting these criteria should question patients regarding potential risk of recent exposure to Zika, including visits to areas with mosquitoes known to transmit the infection and unprotected sex with a partner who has undertaken such travel. When calculating the possibility of Zika after a potential exposure, clinicians should be aware the incubation period for the infection is believed to be in the range of 2–14 days (Florida Department of Health, 2016).

In addition, mothers of an infant or fetus with microcephaly, intracranial calcifications or adverse pregnancy outcomes subsequent to travel after the first trimester to a known area with Zika should be reported to the local health department, and testing of the mother and infant is recommended (Florida Department of Health, 2016). Any pregnant woman who has travelled to an area reporting active Zika should also be tested, preferably within 2–12 weeks of travel.

Diagnosis

Health providers should be aware of and follow local policies in regard to testing for Zika. Please refer to Figure 1 below for a visual representation of the recommended testing protocol (Centers for Disease Control, 2016a).

In the United States, approval of the health department is required for Zika testing (U.S. Department of Health and Human Services, 2016b). During the first two weeks after the start of illness, the preferred test is real-time reverse transcriptase polymerase chain reaction (rRT-PCR) from serum and urine and samples (Centers for Disease Control, 2016b). While a positive test confirms infection, a negative test does not rule out infection as the level of detectable virus RNA may decrease over time. Therefore, by the end of the first week of infection, Zika virus-specific IgM and

neutralising antibodies can be confirmed with serology assays (Centers for Disease Control, 2016b). However, these results should be interpreted with caution, as they may have cross-reactivity with related flaviviruses such as dengue and West Nile fever.

The guidelines are based on the different points at which these diagnostic tools can detect the infection. In the case of pregnant women who are demonstrating symptoms of infection within the previous 2 weeks, providers should obtain serum and urine samples in order to conduct the rRT-PCR test (Odebuyo et al., 2016). If medical attention is sought between 2 and 12 weeks after symptom onset, the IgM test is conducted first and followed up with rRT-PCR if the result is positive or equivocal (Odebuyo et al., 2016). In the case of women who do not have symptoms, recommendations depend on whether possible exposure is ongoing. An asymptomatic pregnant women who may have been exposed to Zika but does not live in an area with active Zika transmission (or have unprotected sex with a partner who does) should be administered the rRT-PCR if the most recent exposure occurred within the previous two weeks, also followed by an IgM test between 2 and 12 weeks after the most recent exposure if the initial result is negative (Odebuyo et al., 2016). However, for pregnant women for whom potential exposure to Zika is ongoing, the IgM test is recommended during the second and third trimesters and immediately followed with rRT-PCR if the result is positive or equivocal (Odebuyo et al., 2016).

The American Congress of Obstetricians and Gynecologists (2016) recommends that additional serum samples be drawn and stored at time of testing in case further evaluation is needed, especially if patients present within two weeks of symptom onset or for IgM testing 2–12 weeks after possible exposure. Healthcare personnel can contact local laboratories and health departments to confirm storage capacities and policies.

Clinical and supportive care

For patients who may have been exposed to Zika, it is essential for healthcare personnel to offer care and support for those undergoing the process of screening and diagnosis (U.S. Department of Health and Human Services, 2016b). Providers should demonstrate empathy and provide those in their care the most accurate information possible about the illness and risks. During this time, it is vital that the health facility be attuned to patient needs. Concerns should be acknowledged, especially during the challenging period of waiting for test results. Patients should be informed that results may take up to three weeks (U.S. Department of Health and Human Services, 2016a), although in some cases they may be available within several days. Consideration should be given to providing a mental health referral as appropriate.

Figure 1. Zika virus testing (adapted from Centers for Diseases Control, 2016a).

Of particular note, a pregnant patient receiving positive results for Zika should be provided additional health resources and encouraged to discuss individual options, such as amniocentesis and ultrasound, with their obstetricians. Depending on individual factors, a patient may or may not be aware of risks of microcephaly and other serious neurological birth defects to children born to women infected with Zika, as well as the potential for pregnancy loss (American Congress of Obstetricians and Gynecologists, 2016). For this reason, providing appropriate care and support to a pregnant mother at the time of diagnosis is of utmost importance. Providers should also work with the patient to participate in the country's applicable Zika Pregnancy Registry in order to monitor the effects of the virus during pregnancy and beyond.

In most cases, clinical care for most patients with Zika is supportive, consisting primarily of acetaminophen and fluids (Centers for Disease Control, 2016b). Non-steroidal anti-inflammatory drugs (NSAIDs) should be avoided to prevent risk of bleeding until coinfection with dengue can be ruled out. However, clinicians should be aware that in some instances Zika has been associated with Guillain-Barré syndrome, a neurological complication that can cause paralysis and potentially be life-threatening (Centers for Disease Control, 2016c).

Prevention of transmission

All patients with suspected or confirmed Zika should wear a condom for sexual intercourse to prevent further

transmission. Specific guidelines are continuously being updated as new information becomes available and health professionals should be aware of and educate patients as to the most updated current recommendations in this regard. Currently, the WHO advises all women and men who have had possible exposure to the Zika virus to practice safer sex for at least six months afterwards (World Health Organization, 2016b). These guidelines apply whether or not the individual in question has had any Zika symptomatology.

To further reduce risk of possible transmission, in areas where potential mosquito transmission is a concern, all patients who may have the potential to communicate Zika should follow strict precautions to avoid further vector exposure (Centers for Disease Control, 2016b). These individuals should be advised to stay primarily indoors and use mosquito repellent when necessary for three weeks after infection. Those who may have been exposed to Zika should also refrain from donating blood for 28 days (Plourde and Bloch, 2016).

Conclusion

At this time, the course and potential expansion of the Zika virus is unknown, but its advance around the globe is of grave concern to healthcare workers and epidemiologists worldwide. However, prompt identification by clinicians can play an essential role in limiting the spread of the infection. It is vital that healthcare workers be prepared to provide support and education to all individuals diagnosed with Zika to reduce transmission of the disease.

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