CE

Zika: What Providers Need to Know

Charleen McNeill, PhD, RN, Marilou D. Shreve, DNP, PNP-BC, Anna Jarrett, PhD, FNP-BC, and Cheryl Perry, BSN, RN

ABSTRACT

Emerging or reemerging infectious diseases (EIDs) are rapidly increasing. EIDs will remain a major cause of disease and death worldwide. One such EID is the Zika virus (ZIKV). ZIKV proves to be a global public health crisis. In January 2016, it became a notifiable condition in the United States. Providers must be knowledgeable regarding preventive measures as well as the proper diagnosis and treatment for it. The most current, evidence-based guidelines for managing ZIKV in the general population as well as specific recommendations for pregnant women are presented.

Keywords: arboviruses, flaviviridae, infectious disease, treatment guidelines, Zika virus

All authors are affiliated with Eleanor Mann School of Nursing at the University of Arkansas in Fayetteville. Charleen McNeill, PhD, RN , is an assistant professor and can be reached at cmcneill@uark.edu. Marilou D. Shreve, DNP, PNP-BC, is an assistant professor. Anna Jarrett, PhD, FNP-BC, is an assistant professor. Cheryl Perry, BSN, RN, is a graduate assistant. *In compliance with national ethical guidelines, the authors report no relationships with business or industry that would pose a conflict of interest.*

Emerging or reemerging infectious diseases (EIDs) are new to a population or have existed in a geographic area, but their rate of occurrence is rapidly increasing.[1] Despite efforts to eradicate them, EIDs remain a concern for all countries because they threaten economies and public health.[2] Experts predict that EIDs will remain a major cause of disease and death worldwide because of the increasing number of infectious diseases.[3] These diseases may threaten the lives of United States citizens, although they are likely to originate elsewhere. Although nurse practitioners (NPs) in the US may not have seen many of these diseases, they must be aware of them so they can accurately assess, diagnose, and treat them. One such EID of increasing prevalence is caused by the Zika virus (ZIKV).

Despite the numbers of EIDs and their impact in the US, NPs report inadequate education on

This CE learning activity is designed to augment the knowledge, skills, and attitudes of nurse practitioners as they care for patients with potential ZIKV infection.
At the conclusion of this activity, the participant will be able to:
A. Identify patients at risk for ZIKV
B. Formulate appropriate prevention and treatment plan for patients with exposure or symptoms of ZIKV
C. Explain when to refer patients for potential complications of ZIKV
The authors, reviewers, editors, and nurse planners all report no financial relationships that would pose a conflict of interest.
The authors do not present any off-label or non-FDA-approved recommendations for treatment.

This activity has been awarded 1.0 Contact Hours of which 0 credits are in the area of Pharmacology. The activity is valid for CE credit until July 1, 2018.

To receive CE credits, read the article and answer each question. Required minimum passing score is 70%. Applicants who prefer to mail the test answers and evaluation should send them and a processing fee check for $10 (made out to Elsevier) to PO Box 1461, American Fork, UT 84003. Applicants who want to take the test online may do so at www.npjournal.org/cme/home for a $5 fee.

This educational activity is provided by Nurse Practitioner Alternatives™.
NPA™ is accredited as a provider of continuing nursing education by the American Nurses Credentialing Center's Commission on Accreditation.
Accreditation does not imply endorsement by the provider, Elsevier, or ANCC of recommendations or any commercial products displayed or discussed in conjunction with the educational activity.

infectious disease processes in US nursing schools.[4] Primary prevention and secondary health interventions should occur in all health care delivery settings. This requires an interdisciplinary approach to topics such as epidemiology, burden, and course of diseases.[5] There is an increased potential for indigenous transmission of ZIKV in the US because of the impending spring and summer season and the typical increase in mosquitoes in many areas.[6] This increase in the potential for indigenous transmission of ZIKV serves as the impetus for efforts to educate health care providers in the assessment, treatment, and education of this rapidly spreading virus. NPs are well positioned to provide surveillance and patient education of ZIKV in the community. To facilitate the provision of surveillance and patient care, the history, epidemiology, pathophysiology, prevention, screening, reporting, diagnosis, treatment, patient education, and provider education for ZIKV as of April 3, 2016, are presented.

HISTORY

Discovered in 1954, ZIKV has been isolated from several types of mosquitoes, including *Aedes aegypti* and *Aedes albopictus,* proving them to be competent vectors.[7] Between 2008 and 2016, the number of geographic locations affected by ZIKV and the prevalence of ZIKV within those locations have increased, showing the worldwide spread of the virus.[8] Travel-associated cases of ZIKV have been widespread in the US. Figure 1 shows the distribution of ZIKV in the US as of March 31, 2016.[9]

EPIDEMIOLOGY

A aegypti and *A albopictus* mosquitoes are of the most concern in the US because they are found throughout the southern US; extremely warm temperatures may extend their range further north.[6] Over 60% of the US population live in areas conducive to seasonal ZIKV transmission, some in areas where year-round transmission can occur.[8] Figure 2 provides the estimated range of *A aegypti* and *A albopictus* in the US in 2016 according to the Centers for Disease Control and Prevention (CDC).[10] Although mosquitoes are the primary mode of transportation of ZIKV, it can also be transmitted via sexual intercourse.[11] Evidence regarding the transmission of ZIKV by blood transfusions and urine is being compiled.[12,13] Furthermore, ZIKV RNA has been detected in other body fluids including saliva, semen, and amniotic fluid.[14] Because the evidence is evolving, providers should continue to monitor the situation for updates to ensure their practice is based on current evidence-based recommendations.

PATHOPHYSIOLOGY

Arboviruses

The most widely known flaviviruses are yellow fever (YFV), dengue virus (DENV), and West Nile virus. Now, ZIKV has been introduced to the world as a cousin to DENV.[15] When the female mosquito bites, the snout tries to locate a blood vessel. It is at this time that virus particles are deposited into a victim's epidermis and dermis.[16]

Replication of ZIKV

Because ZIKV is a positive single-strand RNA virus, it replicates in the cytoplasm instead of the nucleus.[17] ZIKV manipulates the autophagic response of the cytoplasm by the cell, which causes an interruption in the normal process. The result is viral dissemination throughout the body.[16,18] It is hypothesized that if ZIKV causes autophagy in fibroblasts, similar responses may also occur in other cells, such as neural cells.[18] Research continues with the hope of understanding the full range of cellular aberrations ZIKV may cause.

Complications From ZIKV

Hospitalizations because of complications with ZIKV historically have not been common. The 2 most common complications known to date are microcephaly in infants born to pregnant women who had ZIKV symptoms during pregnancy and Guillain-Barre syndrome in adults.[19,20] Other potential complications include pregnancy loss, ocular lesions, and temporary hearing loss.[20]

PREVENTION

In all health care settings, standard precautions should be observed.[14] The use of personal protective equipment can prevent the transmission of ZIKV. In labor and delivery settings, there is a higher loss of blood and exposure to amniotic fluids. Health care