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Lindsay D. Sullivan
Otterbein University, lindsay.sullivan@otterbein.edu

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Chikungunya Virus: A Case Study of the Emerging Vector-Borne Disease

Lindsay D. Sullivan BSN, RN
Otterbein University, Westerville, Ohio

Introduction

The Chikungunya virus (CHIKV) has rapidly spread across the Americas. Since its emergence in Sub-Saharan Africa in the late 18th century, CHIKV has spread to many isolated outbreaks in Africa, Southeast Asia, and Australia. Over the last decade, the vector-borne disease has impacted millions of people across the Indian Ocean, India, and now the Americas with the aid of viral mutations and increased international travel (Weaver & Spalding, 2015).

This report will focus on the first case of CHIKV transmission in the Western Hemisphere which was recently reported in Martin in October 2013, an individual carrying an Asian strain of CHIKV was bitten by a local mosquito (Aedes aegypti) and became a local carrier of the virus (Weaver & Spalding, 2015). This makes the CHIKV a tropical location that is found in the Caribbean, Central America, much of South America, and the southeastern United States. There are over 12 million reported cases in the Americas from 2013 to 2015 (Galuis, 2015). Recently, there have been 11 CHIKV cases in Florida which were transmitted by local mosquitos. Further spread of the virus throughout the Americas is expected (Weaver & Leuliette, 2015). If a single gene mutation on the development protein occurs (which has happened on La Reunion Island), it could significantly boost the spread of the virus to another mosquito species, A. albopictus. A. albopictus inhabits much of the United States, and is also called Asian tiger mosquito. It has become more prevalent on the west coast and as far south as Florida (Galuis et al., 2016).

Advanced practice nurses (APNs) should be aware of the clinical signs and symptoms, pathophysiology, and the current research regarding CHIKV because of its recent rapid spread in the Western Hemisphere. The Centers for Disease Control and Prevention (CDC) are working to protect and treat patients suffering from CHIKV by fogging the mosquitoes and by educating the public to prevent the disease. Local authorities can prevent CHIKV by fogging the mosquitoes and by avertting standing water. Understanding the pathophysiology of CHIKV can help practitioners to order the appropriate diagnostic tests and predict the course of events in the CHIKV infection process. The significance of comprehending the pathophysiology of CHIKV is important in the apparent development of treatments and a vaccine. Further research regarding the cause of the chronic fevers is needed in order to treat this complication.

Case Study

A 28 year old woman visited Mumbai, India in September 2010 and received many vectors in her trip. Twelve days into her trip, she experienced a sudden onset of fever, chills, hyperaggravation on the bridge of her nose, and severe joint pain in her wrists, ankles, feet, and elbows. She was treated in a local clinic and fever lasted for three days with no recurrence (Schwartz, Gigs, & Rogell, 2014). After her recovery from acute illness, she still experienced considerable joint pain and restricted range of motion in her wrists, neck, and ankles. She was referred to a tropical medicine specialist in Bombay, India where she was diagnosed with CHIKV. She then was referred to a rheumatologist in Seattle, Washington where she was prescribed ibuprofen and physical therapy for treatment. Her arthralgia and nonreactive dengue IgM antibodies, it was concluded that the dengue IgG was positive. She was diagnosed with CHIKV, a vector-borne disease has been transmitted by local mosquitoes.

Pathophysiological Process

Understanding the pathophysiology of CHIKV is important in the apparent development of treatments and a vaccine. The acute phase lasts a few days to a couple of weeks. There is a strong and immediate immune response to infection in the form of a viral-specific T cell response and an antibody response (Schwartz & Cheeneebash, 2010). The adaptive immune (primarily IgG and IgM antibodies) response can be identified through the antibody titer to CHIKV by fogging the mosquitoes and by educating the public to prevent the disease. Local authorities can prevent CHIKV by fogging the mosquitoes and by avertting standing water. Understanding the pathophysiology of CHIKV can help practitioners to order the appropriate diagnostic tests and predict the course of events in the CHIKV infection process.


The acute phase involves a sudden onset of high fever and joint pain. Headache, myalgia, photophobia, diarrhea, vomiting, nausea, and lymphopenia are frequent in the acute phase and usually resolve within 4 days (Schwartz & Cheeneebash, 2010).

Nursing Implications

Due to the increased incidence of CHIKV, there has been significant increases in international travel and globalization of patients infected with CHIKV are presenting to providers in the United States.

• CHIKV is often mistaken for Dengue fever and sometimes malaria. The dengue virus is also considered a potential threat to health care practitioners when frequently present with hemorrhagic fever whereas patients with CHIKV will usually experience lasting and debilitating joint pain (Tither, 2014).

• There is no drug or vaccine to protect anyone from CHIKV, so patients should be counseled to use bug spray, protective clothing, and mosquito nets as protection from mosquito bites.

• If a patient presents with a possible infectious disease, always inquire about travel history and refer to infectious disease specialist for treatment if needed.

• Refer to the Centers for Disease Control and Prevention’s traveler’s website for the most up to date information on CHIKV (Tither, 2014).

• CHIKV will soon have CDC reporting requirements (Mowen, 2013).

Conclusion

Chikungunya virus is a global threat to health care providers affecting 1.2 million people in the Americas alone. 2500 cases were reported in the United States in 2015 (Galuis, 2015). The CDC provides the most accurate amount of resources to providers regarding updates on the spread of the disease and prevention. Nurse practitioners need to be aware of the pathophysiology and signs, symptoms, and prevention of CHIKV in order to protect patients and to treat patients appropriately. Pre-travel counseling about mosquito bite prevention is the best way to protect people from CHIKV in this globalized world.

References


