Chikungunya Fever: Could an Outbreak Happen Here?

BY BRUCE JANCIN

VAI., Colo. — Chikungunya fever is a tropical disease few American physicians are familiar with, but that could change quite suddenly, as physicians in temperate Northern Italy discovered to their great surprise two summers ago.

This mosquito-borne disease, marked by sudden high fever, arthralgia and myalgia, prominent skin rash, and headache occurs in sub-Saharan Africa and Asia. At least, that was true until August 2007, when an outbreak of 254 cases—one fatal—struck out of the blue in the Ravenna province of Northeastern Italy.

What happened?

The traditional vector of Chikungunya virus is the Asian tiger mosquito. But when the virus underwent a mutation in a gene coding for a viral envelope protein, the mutant strain became at least 100-fold more infectious for the A. albopictus mosquito, also known as the Asian tiger mosquito. The virus essentially jumped aboard a more competent vector.

Indeed, transmission by A. albopictus was responsible for a 2005-2006 outbreak of 700,000 cases of Chikungunya fever in the Reunion Islands off the Eastern coast of Africa. The outbreak then spread to India and Sri Lanka, where it caused more than 1.3 million cases, Dr. Kenneth L. Tyler explained at a conference on pediatric infectious diseases sponsored by the Children’s Hospital, Denver.

“Could something similar occur in the United States?” as it happens, A. albopictus is endemic throughout the Southeastern United States. The mosquito is thought to have arrived in 1985 via the port of Galveston, Texas, in a shipment of tires from Southeast Asia and has since gradually spread throughout much of the South. And 57 U.S. cases of Chikungunya fever imported from the Indian Ocean outbreak have been documented, including 5 viremic patients. Two of those five returned to Louisiana and South Carolina, states where A. albopictus is endemic. So perhaps a U.S. outbreak was a near miss.

Chikungunya fever is a dengue-like illness characterized by 2-5 days of sudden onset high fever and chills, and a petechial or maculopapular rash, mainly on the trunk. This is followed by arthralgic disease that can last weeks or months.

Indeed, the root of the word “Chikungunya” in Tanzania, where the virus was first isolated in the early 1950s, comes from a verb that means “become distorted” in local dialect, reflecting the severe joint symptoms.

Neurologic manifestations of Chikungunya fever in children include encephalitis, meningitis, and febrile seizures. In adults, meningitis and encephalitis can occur early, during the acute febrile stage of the disease, with acute neuropathy and myelitis occurring later.

Dr. Tyler offered Chikungunya fever as an example of an emerging CNS viral infection moving into new geographic regions as a result of expanded vector competence. But he noted that just as new viral diseases can emerge, once-familiar and important ones can reemerge or submerge, for unexplained reasons.

Case in point: Western equine encephalitis, which has mysteriously disappeared from the U.S. scene in recent years. There hasn’t been a single reported case since the turn of the century. “The virus still circulates. It doesn’t seem to be less virulent in mouse studies. It just doesn’t seem to be an important cause of human encephalitis anymore. The virology doesn’t seem to provide an explanation,” he observed. “It makes one a little bit uncomfortable, because just like things can disappear they can reappear.”