*What you need to know about . . .*

# Viral Hemorrhagic Fevers and Bioterrorism

## What are viral hemorrhagic fevers?

Viral hemorrhagic fevers (VHFs) are a group of illnesses caused by several distinct families of viruses. In general the term "viral hemorrhagic fever" describes severe problems affecting several organ systems in the body. Typically, the entire system of blood vessels is damaged, and the body has problems regulating itself. Symptoms often include bleeding, but the bleeding itself is rarely life-threatening. VHFs are caused by viruses of four families:

- Arenavirus including Lassa fever and Argentine, Bolivian, Brazilian and Venezuelan hemorrhagic fevers;
- Filovirus including Ebola and Marburg;
- Bunyavirus including Hantavirus and Rift Valley Fever;
- Flavivirus including yellow fever and dengue fever.

## Can viral hemorrhagic fevers be used as bioterrorism threats?

Viral hemorrhagic fever viruses can be very infectious, and outbreaks of VHF can result in high death rates. Ebola and Marburg viruses are the most likely of viral hemorrhagic fevers to be used as biological weapons. Attempts have been made to use these viruses as weapons by aerosolizing infected body fluids or rodent excrement.

## How are viral hemorrhagic fevers spread?

In nature, viruses causing hemorrhagic fever typically are passed from mice, rats, fleas and ticks to humans. People can be infected when they come in contact with urine, fecal matter, saliva or other body fluids from infected rodents. Fleas and ticks transmit the viruses when they bite a person or when a person crushes a tick. Hosts for some viruses such as Ebola and Marburg are not known. Some viruses such as Ebola, Marburg and Lassa can be spread from person to person by direct contact with infected blood or organs or indirectly through contact with objects such as syringes or needles that are contaminated with infected body fluids.

## What are the symptoms?

Symptoms vary with the different virus families, but first signs often include sudden fever, weakness, muscle pain, tiredness, headache and sore throat. Patients with severe cases of VHF often show signs of bleeding under the skin, in internal organs or from the mouth, eyes or ears. Very ill patients may also have a nervous system breakdown, delirium and seizures and may go into shock and a coma. Some types of VHF are linked to kidney failure. Percentage of death among cases depends on the virus family but can be as high as 90 percent with Ebola.

## How soon do symptoms appear?

Symptoms begin anywhere from 2 to 21 days after infection, depending on the specific virus.

## How are viral hemorrhagic fevers treated?

There is no treatment or cure for viral hemorrhagic fevers. Supportive care includes maintaining a patient's fluids, watching oxygen levels and blood pressure, and treating any infection. Ribavirin, an anti-viral drug, has been helpful in treating some people with Lassa fever.

## Is there a vaccine?

Currently there is a vaccine only for yellow fever and Argentine hemorrhagic fever. No other vaccines have been developed to prevent VHFs.

## How can I protect myself?

Avoid close physical contact with infected people and their body fluids. Infected people may be isolated, and those who care for them wear protective clothing. If you have had casual contact with a VHF patient, take your temperature twice a day for up to three weeks after contact. If any symptoms appear, tell your doctor about your exposure to VHF.

## What is the public health system doing about the possibility of an outbreak?

Local, state and federal public health agencies are actively working with local health care providers, hospitals, emergency response teams, laboratories, veterinarians and others to prepare for infectious disease outbreaks and biological disasters of all types, including viral hemorrhagic fevers. If bioterrorism is suspected, the Department of State Health Services notifies the CDC, FBI and other appropriate authorities.

## Where can I get more information?

Contact your local health department. Information about viral hemorrhagic fevers can be found on the Department of State Health Services Web site at www.dshs.state.tx.us/ideas/ebola/faqs/ and the CDC Web site at www.cdc.gov/ncidod/diseases/virlfvr/virlfvr.htm.

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