



Viral Hemorrhagic Fevers Information Sheet

NORAD-USNORTHCOM/SG

What are Viral Hemorrhagic Fevers?

Viral hemorrhagic fevers (VHFs) refer to a group of illnesses caused by several distinct families of viruses. In general, the term "viral hemorrhagic fever" is used to describe a severe syndrome where multiple organ systems in the body are affected.

Why are we concerned with Viral Hemorrhagic Fevers as a bioweapon?

Some HFVs and pose serious risk as biological weapons, including Ebola and Marburg viruses (Filoviridae), Lassa fever and New World arenaviruses (Arenaviridae), Rift Valley fever (Bunyaviridae), and yellow fever, Omsk hemorrhagic fever, and Kyasanur Forest disease (Flaviviridae). Hemorrhagic fever viruses have been weaponized by the former Soviet Union, Russia, and the United States. There are reports that yellow fever may have been weaponized by North Korea. Yellow fever and Rift Valley fever viruses were developed as weapons by the US offensive biological weapons program prior to its termination in 1969.

Does this disease occur naturally?

Viruses associated with most VHFs reside in an animal reservoir host or arthropod vector. They are totally dependent on their hosts for replication and overall survival. For the most part, rodents and arthropods are the main reservoirs for viruses causing VHFs. While people usually become infected only in areas where the host lives, occasionally people become infected by a host that has been exported from its native habitat. Sometimes, a person becomes infected in an endemic area and then carries the virus to a non-endemic area.

Are there different forms of this disease? If yes, how are they different (i.e. cutaneous, inhalational)

There are a variety of potential clinical manifestations following infection with these viruses, and not all patients develop the classic VHF syndrome. Therefore, in the event of a bioterrorist attack with one of these agents, infected patients may have a variety of clinical presentations, complicating early detection and management.

Is the disease seasonal in its occurrence?

No, these viruses come from equatorial regions without significant seasonal variations.

Where is the disease currently established?

Taken together, the viruses that cause VHFs are distributed over much of the globe. However, because each virus is associated with one or more particular host species, the virus and the disease it causes are usually seen only where the host species live(s). Some have restricted distribution, while others have a worldwide distribution.

How does it spread? Who is at risk? Vector/host/reservoirs, person-to-person contact? Is it contagious?

Viruses causing hemorrhagic fever are initially transmitted to humans when the activities of infected reservoir hosts or vectors and humans overlap. The viruses carried in rodent reservoirs are transmitted when humans have contact with urine, fecal matter, saliva, or other body excretions from infected rodents. The viruses associated with arthropod vectors are spread most often when the vector mosquito or tick bites a human, or when a human crushes a tick. However, some of these vectors may spread virus to animals, livestock, for example. Humans then become infected when they care for or slaughter the animals. Some hemorrhagic viruses can spread from one person to another, once an initial person has become infected. Ebola, Marburg, Lassa and Crimean-Congo hemorrhagic fever viruses are examples.

What is the risk of catching Viral Hemorrhagic Fevers? Locale, age, gender.

Risk factors for catching VHF are related to exposure to the vector, host or reservoirs.

What are the symptoms of Viral Hemorrhagic Fevers (clinical presentation)

Specific signs and symptoms vary by the type of VHF, but initial signs and symptoms often include marked fever, fatigue, dizziness, muscle aches, loss of strength, and exhaustion. Patients with severe cases of VHF often show signs of bleeding under the skin, in internal organs, or from body orifices like the mouth, eyes, or ears. However, although they may bleed from many sites around the body, patients rarely die because of blood loss. Severely ill patients may also show shock, nervous system malfunction, coma, delirium, and seizures. Some types of VHF are associated with renal (kidney) failure.

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How soon do infected people get sick/Incubation period?

The incubation period of VHF is usually 12-14 days (range 7-17). During this period, the person looks and feels healthy and cannot infect others.

How are Viral Hemorrhagic Fevers diagnosed? How good are the tests (accuracy, false positive/negatives, FDA status, etc.)

Clinical microbiology and public health laboratories are not currently equipped to make a rapid diagnosis of any of these viruses, and clinical specimens would need to be sent to the Centers for Disease Control (CDC) or the US Army Medical Research Institute of Infectious Diseases (USAMRIID).

Is a vaccine available to prevent Viral Hemorrhagic Fevers?

There is a FDA approved vaccine for Yellow Fever virus. Investigational vaccines under development include Argentine Hemorrhagic Fever and Rift Valley Fever. For all others no vaccines exist that can protect against these diseases.

Can Viral Hemorrhagic Fevers be treated?

Pre – exposure? Vaccine as stated above.

Post exposure/prior to onset of symptoms? The yellow fever vaccine would not be useful in preventing disease if given in the post exposure setting because yellow fever has a short incubation period. All are produced in limited supply, and world stocks are not sufficient to meet a surge.

Post exposure/after onset of symptoms? Patients receive supportive therapy, but generally speaking, there is no other treatment or established cure for VHF. Ribavirin, an anti-viral drug, has been effective in treating some individuals with Lassa fever or Hemorrhagic Fever Renal Syndrome (HFRS).

Where will the medications/immunizations to treat infected individuals come from?

Yellow Fever Vaccine is available commercially. Investigational vaccines are only available through USAMRIID or the Centers for Disease Control.

Contraindications to vaccine, antibiotic therapy, other treatments (ie. Pregnancy, immunosuppression, etc)

Ribavirin is contraindicated in pregnancy unless disease is confirmed in the patient. With disease confirmation the benefits of treatment outweigh the risks to the pregnancy.

How long can Viral Hemorrhagic Fevers exist in the environment? Are there ways to test for Viral Hemorrhagic Fevers in the environment?

In general these lipid viruses are not expected to persist in the environment for prolonged periods. No field expedient methods are available for testing. Samples must be sent to a laboratory for testing

What should someone do if they suspect they or others have been exposed to Viral Hemorrhagic Fevers?

Contact public health officials immediately for further instructions. Persons considered potentially exposed in a bioterrorist attack and all known high-risk and close contacts of patients diagnosed with VHF should be placed under medical surveillance.

What can I do to reduce the risk of getting Viral Hemorrhagic Fevers or giving it to someone else?

Avoid contact with people and animals that may be infected with the virus. Avoid contact with clothing or bedding of infected persons. Use insect repellent, proper clothing, bednets, window screens, and other insect barriers to avoid being bitten.

References:

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