VIRAL HEMORRHAGIC FEVERS

Viral hemorrhagic fever is a nonspecific syndrome that can be caused by several different viruses, from the families Flaviviridae, Bunyaviridae, Arenaviridae, and Filoviridae. All contain RNA, and most are zoonotic. However, they differ in their modes of transmission, animal reservoirs, and ability to be transmitted directly from human to human. Both arthropod-borne and rodent-associated viruses cause viral hemorrhagic fevers. The rodent-associated viruses do not require an arthropod vector but are transmitted directly to vertebrates by infectious excreta or secretions of the rodent.

Family of viruses	Vectors	Name of viral hemorrhagic fever
Bunyaviridae	Mosquito	Rift valley fever
	Tick	Crimean-congo hemorrhagic fever
	Rodent	Hantavirus fever
Flaviviridae	Mosquito	Dengue fever, yellow fever
	Tick	Omsk fever, kyasanur forest disease
Arenaviridae	Rodent	Lujo virus fever, lassa fever, argentine fever, bolivian fever, venezuelan fever
Filoviridae	Bat	Ebola hemorrhagic fever, marburg hemorrhagic fever

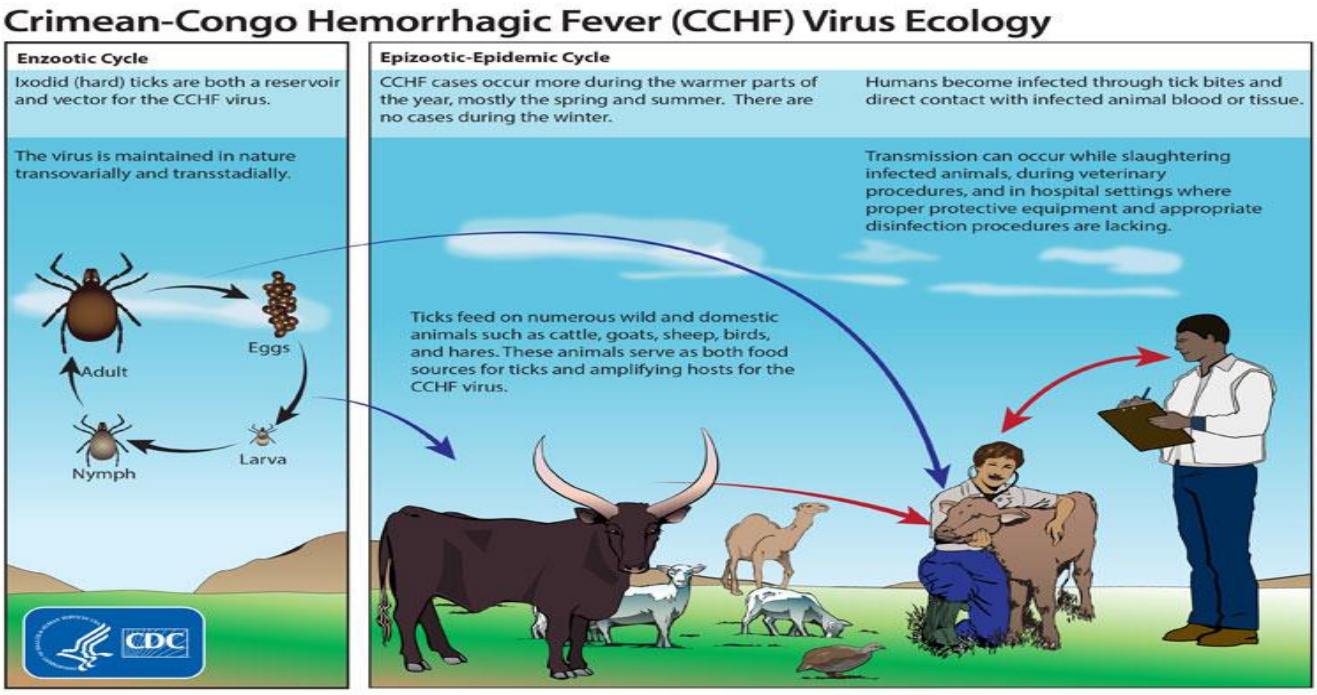
Crimean-Congo Hemorrhagic Fever

Crimean-Congo hemorrhagic fever is caused by a virus of the Nairovirus genus, family Bunyaviridae. The virus has a single-stranded RNA genome, is enveloped and spherical, and replicates in suckling mice

and several cell culture systems.

Epidemiology

Crimean-Congo hemorrhagic fever is a tick-borne infection whose distribution includes parts of the former Soviet Union, the Balkan nations, Iraq, Iran, the Indian subcontinent, Afghanistan, northwestern China, the Middle East, and most of sub-Saharan Africa, including South Africa. The disease was first characterized in the Crimean in 1944 as Crimean hemorrhagic fever. It was recognized in 1969 as the cause of illness in the Congo, thus the current name.



The virus is harbored and transmitted in nature, principally by ixodid ticks(hard ticks family) of the genus *Hyalomma* (not soft ticks)

The virus is transmitted among ticks, with amplification in vertebrates, including sheep, and cattle. In Africa, antibodies against Crimean-Congo hemorrhagic fever have been found in giraffes, buffalos, zebras, and dogs.

Transmission to humans occurs through contact with infected animal blood or ticks. Crimean-Congo hemorrhagic fever can be transmitted from one infected human to another by contact with infectious blood or body fluids. Outbreaks have been reported in military personnel, campers, and persons tending sheep and cattle..

- Health care personnel have been infected through contact with infectious human blood and tissue. Health care–associated spread as a result of improper sterilization of medical equipment, reuse of injection needles, and contamination of medical supplies has been documented

Pathophysiology

- The target organ is the vascular bed.
- Dominant clinical features are due to micro vascular damage and changes in vascular permeability
- In most cases of viral hemorrhagic fever, the coagulopathy is multifactorial, including:
  - hepatic damage
  - disseminated intravascular coagulation
  - primary marrow injury to megakaryocytes

Pathobiology

After initial inoculation, the virus is spread by blood and the lymphatic circulation and achieves high levels in multiple organs, including the liver. Diffuse foci of necrosis and hemorrhage are seen, with Councilman's bodies in hepatocytes. DIC occurs within the first 3 days of illness.

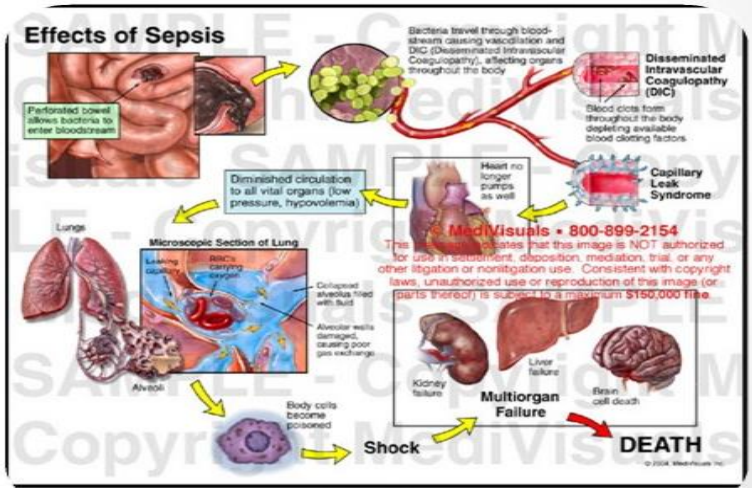
Clinical Manifestations

After an incubation period of 2 to 9 days, patients have a sudden onset of fever with symptoms that include headache, myalgia, pharyngitis, conjunctivitis, nausea, vomiting, diarrhea, and abdominal pain. Petechiae may be seen on the soft palate, and jaundice and hepatomegaly may be present. In severe cases, mood alterations and confusion may be noted.

As the illness progresses, large ecchymoses, severe epistaxis, and persistent bleeding at injection sites can be seen, usually beginning on about the fourth day of illness and lasting approximately 2 weeks. Aminotransferase and serum bilirubin levels are often elevated in late illness. Evidence of DIC is seen (abnormal prothrombin, activated partial thromboplastin, and thrombin times and increased fibrin degradation products). Multiple organ system failure may lead to death, usually during the second week of illness. Other potentially lethal complications include severe blood loss, cerebral hemorrhage, and pulmonary edema.

Can lead to Major Organ Failure

- The liver becomes swollen and painful. Disseminated intravascular coagulation may occur as well as acute kidney failure and shock, and sometimes acute respiratory distress syndrome.



Diagnosis

Laboratory diagnosis can be made by a

1. Positive serologic test result, Antibodies are detectable by immunofluorescence and ELISA in surviving patients. Specific IgM and IgG are present by days 7 to 9 of illness.

2. evidence of viral antigen in tissue by immunohistochemical staining and microscopic examination.

3. Identification of viral RNA sequences in blood or tissue by PCR in a patient with a clinical history compatible with Crimean-Congo hemorrhagic fever. Virus or nucleic acid is easily detected during the first 8 days of illness.

Treatment

Treatment is supportive, including:

1. Monitoring and correction of volume status and electrolyte imbalances Careful fluid management is necessary to avoid fluid overload..

2. Support of the coagulation system.

3. Careful sedation, and pain control.

Prevention

and (طارد للحشراتMeasures to prevent tick attachment, including repellents(protective clothing, should be used by individuals in high-risk settings, such to مواشيas livestock enclosures in affected areas. Treatment of livestock reduce the tick burden may reduce transmission to humans. Handling of blood and tissue of sick sheep and cattle should be minimized and undertaken with appropriate safety and hygiene precautions.

Standard precautions for infection control should be used, including appropriate management of sharp items such as injection needles, appropriate protection against contact with blood and body fluids, and the use of barriers to prevent splashes onto mucous membranes when procedures are performed.

Prognosis

Although improvement is usually seen on approximately day 10, patients may remain weak and restless for more than a month. Patients who recover do not demonstrate sequelae. The case-fatality rate has ranged from 15% to as high as 70% in some outbreaks.