15.9F: Classic Viral Hemorrhagic Fevers

Viral hemorrhagic fevers (VHFs) are a group of illnesses that are caused by several distinct families of RNA viruses.

Learning Objectives

• List the types, symptoms and routes of transmission for viral hemorrhagic fevers

Key Points

• VHFs are caused by viruses of four distinct families: arenaviruses, filoviruses, bunyaviruses, and flaviviruses. They are all RNA viruses covered, or enveloped, in a fatty coating.
• Viruses associated with most VHFs naturally reside in an animal host or arthropod vector. For the most part, rodents and arthropods are the main reservoirs for viruses causing VHFs.
• Symptoms include marked fever, fatigue, dizziness, muscle aches, loss of strength, exhaustion, and excessive bleeding under the skin, in internal organs, or from body orifices like the mouth, eyes, or ears.

Key Terms

• hemorrhagic: of, relating to, or producing excessive loss of blood or blood escape from the circulatory system.

The viral hemorrhagic (or haemorrhagic) fevers (VHFs) are a diverse group of animal and human illnesses that may be caused by five distinct families of RNA viruses: the families Arenaviridae, Filoviridae, Bunyaviridae, Flaviviridae, and Rhabdoviridae. All types of VHF are characterized by fever and bleeding disorders and all can progress to high fever, shock and death in many cases. Some of the VHF agents cause relatively mild illnesses, such as the Scandinavian
nephropathia epidemica, while others, such as the African Ebola virus, can cause severe, life-threatening disease.

Four families of RNA viruses have been recognized as causing this syndrome:

- The family Arenaviridae include the viruses responsible for Lassa fever, Lujo virus, Argentine, Bolivian, Brazilian and Venezuelan hemorrhagic fevers.
- The family Bunyaviridae include the members of the Hantavirus genus that cause hemorrhagic fever with renal syndrome (HFRS), the Crimean-Congo hemorrhagic fever (CCHF) virus from the Nairovirus genus, Garissa virus from the Orthobunyavirus and the Rift Valley fever (RVF) virus from the Phlebovirus genus.
- The family Filoviridae include Ebola virus and Marburg virus. Ebola has five viral subtypes including Zaire, Sudan, Bundibugyo, Tai Forest (formerly Ivory Coast), and Reston.
- The family Flaviviridae include dengue, yellow fever, and two viruses in the tick-borne encephalitis group that cause VHF: Omsk hemorrhagic fever virus and Kyasanur Forest disease virus.

Transmission

Transmission to humans depends on the specific virus, but includes:

- By contact with the urine, feces, saliva, or blood of animal hosts such as rodents, fruit bats, subhuman primates, and duikers (antelope)
- From mosquito or tick bites
- Contact with vector-infected livestock
- Consuming infected bush meat

Signs and Symptoms

Signs and symptoms of VHF include fever and bleeding diathesis. Manifestations of VHF often also include flushing of the face and chest, petechiae, frank bleeding, edema, hypotension, and shock. Malaise, myalgias, headache, vomiting, and diarrhea occur frequently. Definitive diagnosis is usually made at a reference laboratory with advanced biocontainment capabilities.

Treatment

For most viral hemorrhagic fevers, there is no effective treatment other than supportive care. The only licensed vaccine available is for yellow fever. Control of rodent populations, insect and other arthropod populations can prevent VHF.