Viral Hemorrhagic Fever

A group of diseases (for humans and non-humans) caused by Enveloped RNA viruses, and in all there is a vascular diffuse damage that may cause bleeding.

These viruses are of four families:-

1- ***Arenaviruses*** 2- ***Bunyaviruses*** 3- ***Filoviruses*** 4- ***Falviviruses***

* Arthropod and rodents are the main vectors

Some specific signs and symptoms may vary but all share some **Initial symptoms:** High fever, headache, muscle and joint pain, tiredness (a prodromal illness lasting less than a week); and **Clinical Signs:** Widespread Bleeding, rash, hypotension, shock, edema, pharyngitis, conjunctivitis

*Blood loss is rarely the cause of death

*Need special labs (level D) so diagnosis is usually delayed

1-Arenaviruses

- Incubation period: 10-14 days
- Include Lassa, Muchupo, Junin and many other viruses but not all cause VHF
- Rats and mice infected → vertically transmitted to offspring → transmitted by bites and wounds to other adult rodents → to the environment by urine, feces…
- Human infected by contact with contaminated material (skin, ingestion, inhalation) or by person to person transmission
- Causes leukopenia and thrombocytopenia
- Lassa fever is more severe and more fatal and reserved in house rats

2-Bunyaviruses

a) Rift Valley

- Incubation Period: 2-6 days
- Aedes Mosquitos infected → vertically to offspring → to livestock causing a very very severe disease
- Humans are infected by mosquitos bite or contact with infected animal
- Flu-like signs (fever,…) → maybe hemorrhage → maybe retinopathy or encephalitis

b) Hantavirus

- Incubation period: 7-21 days
- Rodents infected → vertically or bites to other rodents → urine
- Humans are infected by contact to urine
- Two clinical presentations:

  I) Hemorrhagic Fever with Renal Syndrome (HFRS) caused by Old World Hantaviruses (renal failure)

  II) Hantavirus Pulmonary Syndrome (HPS) caused by New World Hantaviruses (Acute respiratory distress)

c) Crimean-Congo

- Incubation period: 3-7 days
- Ixodid Ticks infected → livestock and wild animals

3) Filoviruses (Ebola and Marburg)

- Incubation period: 4-10
- No known reservoir but maybe bats for Marburg
- person-to-person contact is the main mean of transmission
- Affects primates with the same signs and symptoms
- The most severe VHF; multisystem failure causing the highest mortality,and even Survivors often have arthralgia, uveitis, psychosocial disturbances, and orchitis for weeks

  *Ebola Zaire has the highest fatality

4) Flaviviruses

a) Yellow fever

- Incubation period: 3-6 days
- Aedes aegypti → primates → Aedes aegypti → Primates (called Salyvtic cycle (maintain the disease in primates transported by misquitos))
- Humans are infected by mosquito bite (urban cycle)
- Signs include jaundice, proteinuria

b) Dengue

- Incubation period: 2-5 days
- Aedes aegypti
- Virus isolated from primates but NO symptoms
- Rapid shock occur if no treatment

Treatment

- Supportive therapy (electrolytes balance, blood volume and pressure, oxygenation, complications) *we give inotropic agents (Dobutamine) to prevent shock
- No Antiviral approved EXCEPT Ribavirin for Arenoviruses and Bunyaviruses
- Treatment with convalescent-phase plasma for Junin, Machupo and Ebola (serum taken from recently recovered patients (in convalescent phase) used to treat other patients)

Prevention

Isolation, Rodent and Arthropods control

Vaccination

- Established only for yellow fever (live attenuated 17 D strain) effective for 10 years
- Rift valley, Hanta , Dengue → investigational vaccine are in development phase
- Junin, Muchipo → experimental vaccine under study