Viral Hemorrhagic Fevers (VHFs)

- Zoonoses caused by several different viruses.
- Geographically restricted, mostly to Africa.
- Occur in rural settings or in health-care facilities.
- Lassa fever is widespread in West Africa.
- Mortality overall may be low, as 80% are asymptomatic, but in hospitalized cases mortality averages 15%.
- Ebola outbreaks 1/Year in Congo, Uganda, Sudan.
- VHFs have extended into Europe, with an outbreak of Congo–Crimean hemorrhagic fever in Turkey & even mini epidemics in Iraq.
- All except Ebola & Marburg, have mild self-limiting forms.

Clinical Features

- All have similar non-specific presentations with fever, malaise, body pains, sore throat and headache.
- **O/E:** conjunctivitis, throat injection, an erythematous or petechial rash, hemorrhage, lymphadenopathy, bradycardia.
- Endothelial dysfunction with capillary leak & platelet dysfunction cause Bleeding
- Hypovolemic shock & ARDS may.
- In Lassa fever; joint and abdominal pain are prominent.
- A macular blanching rash may be present but bleeding is unusual, occurring in only 20% of hospitalized patients.
- Encephalopathy may develop & deafness affects 30% of survivors.
- **The clue:**
- Travel to an outbreak area
- Activity in a rural environment contact with sick individuals or animals within 21 days
- Insect bites
- Hospital visits
- Attendance at ritual funerals (Ebola virus infection).
- Fever within 21 days of leaving an endemic area
- Presenting with hemorrhage or organ failure.
- For Lassa fever retrosternal pain, pharyngitis, proteinuria has a positive predictive value of 80% in West Africa.

Investigations

- **Non-specific**: leucopenia, thrombocytopenia, proteinuria.
- In Lassa fever (AST) > 150 U/L associated with 50% mortality.

Management

- Patients at high risk of VHF or if infection is confirmed, must be transferred to a center with the appropriate biosafety & have an initial blood sample tested to exclude malaria.
- If this is negative, relevant specimens (blood, throat swab, urine and pleural fluid (if available) are collected and sent to an appropriate reference laboratory for nucleic acid detection (PCR), virus isolation & serology.
- In addition to general supportive measures, ribavirin is given IV (100 mg/kg, then 25 mg/kg daily for 3 days & 12.5 mg/kg daily for 4 days) when Lassa fever or South American hemorrhagic fevers are suspected.

Viral Hemorrhagic Fevers						
Disease	**Reservoir**	**Transmission**	**Incubation period**	**Geography**	**Mortality rate**	**Clinical features of severe disease[1]**
Lassa fever	Multimammate rats (Mastomys natalensis)	Urine from rat Body fluids from patients	6-21 days	West Africa	15%	Hemorrhage, shock, encephalopathy, ARDS (responds to ribavirin) Deafness in survivors
Ebola fever	Undefined (?bats)	Body fluids from patients Handling infected primates	2-21 days	Central Africa Outbreaks as far north as Sudan	25-90%	Hemorrhage, hepatic and renal failure
Marburg fever	Undefined	Body fluids from patients Handling infected primates	3-9 days	Central Africa Outbreak in Angola	25-90%	Hemorrhage, diarrhea, encephalopathy, orchitis
Yellow fever	Monkeys	Mosquitos	3-6 days	Tropical Africa, South and Central America	~ 15%	Hepatic failure, renal failure, hemorrhage
Dengue	Humans	Aedes aegypti	2-7 days	Tropical and subtropical coasts; Asia, Africa, Americas	< 10%[2]	Hemorrhage, shock
Crimean-Congo hemorrhagic fever	Small vertebrates Domestic and wild animals	Ixodes tick Body fluids	1-3 days up to 9 days 3-6 days up to 13 days	Africa, Asia, Eastern Europe	30%	Encephalopathy, hemorrhage, hepatic or renal failure, ARDS
Rift Valley fever	Domestic livestock	Contact with animals, mosquitos or other insect bites	2-6 days	Africa, Arabian peninsular	1%	Hemorrhage, blindness, meningoencephalitis (complications only in a minority)
Kyasanur fever	Monkeys	Ticks	3-8 days	Kamataka State, India	5-10%	Hemorrhage, pulmonary edema, neurological features Iridokeratitis in survivors
Bolivian and Argentinian hemorrhagic fever (Junin and Machupo viruses)	Rodents (Calomys spp.)	Urine, aerosols Body fluids from case (rare)	5-19 days (3-6 days for parenteral)	South America	15-30%	Hemorrhage, shock, cerebellar signs (may respond to ribavirin)
Hemorrhagic fever with renal syndrome (Hantaan fever)	Rodents	Aerosols from feces	5-42 days (typically 14 days)	Northern Asia, northern Europe, Baikans	5%	Acute renal impairment, cerebrovascular accidents, pulmonary edema, shock (hepatic failure and hemorrhagic features only in some variants)

[1] All potentially have circulatory failure
[2] Mortality of uncomplicated and hemorrhagic dengue fever, respectively

Multiple Choice Questions:

1) VHV never occurs in Iraq. (F)
2) Congo-Crimean VHF is the type that occurs in Iraq. (T)
3) Suspected or confirmed case of VHF is usually managed in usual hospital wards. (F)
4) Malaria should be excluded first in a case of suspected VHF.(T)
5) Any patient presenting with fever or bleeding within 21 of leaving an endemic like Africa should be suspected of having VHF. (T)
6) The cause of bleeding in VHF is endothelial& platelet dysfunctions. (T)
7) Antivirals are essential in all types of VHF. (F)
8) Ebola & Marburg VHF have the highest mortality rates. (T)
9) Congo-Crimean VHF is the only type transmitted by ticks. (F)
10) All VHF types have high mortality rates. (F)