8.3 Viral Hemorrhagic Fevers, List A

Case Definition

Confirmed case

Laboratory confirmation of infection:

- isolation of virus from an appropriate clinical specimen (tier 3 laboratory only)
  OR
- Identification of virus antigen by enzyme immunoassay

AND

- Molecular detection of virus by reverese-transcriptase PCR testing from appropriate clinical specimen

Clinical Presentation

Viral Hemorrhagic Fevers (VHF) includes many geniuses in the family *Filoviridae.* Different forms may have different presentations. Ebola-Marburg is the most significant because of it severity and communicability. This group of disease provides especially high risk because there are virtually no effective treatments.

Ebola-Marburg Viral Diseases
This VHF is characterized by abrupt onset of fever, myalgia, and headache. It is followed by malaise, vomiting, abdominal pain, and pharyngitis. A maculopapular rash appears which is most prominent on the trunk. Severe dehydration and significant wasting can occur. Severe fatal cases also consist of hepatic damage, renal failure, CNS involvement, and terminal shock with organ failure. Serological analysis may also find lymphopenia, severe thrombocytopenia, and elevated transaminase. Creatine, and urea nitrogen levels increase in the final stages accompanying renal failure. The case-fatality rate of Ebola-Marburg can be 25-90%.

Dengue Fever
Dengue fever is often a biphasic febrile virus. It is characterized by sudden onset of headache, myalgia, arthralgia, retro-orbital pain, anorexia, nausea, and vomiting. A maculopapular rash may appear close to the end of fever. Minor bleeding may occur during the febrile phase, though major hemorrhage may happen in some adults. Lymphadenopathy, leukopenia, and mild thrombocytopenia are found as well. Case-fatality is 1-10% and lasts 2-7 days.

Lassa Fever
Lassa fever begins with a gradual onset of malaise, fever (which may spike), headache, sore-throat, cough, nausea, vomiting, diarrhea, myalgia, and abdominal pain. Inflammation and exudation of phaynx and conjunctivae also occurs; symptoms last 1-4 weeks. Severe cases may experience hypotension, shock, hemorrhaging, encephalopathy, edema, and effusion. Platelet function is abnormal. Infections are mild or asymptomatic in 80% of patients. Lassa fever has a case-fatality of 1%.

Rift Valley
The principal difference between this VHF and the others is the presence of ocular disease, consisting of photophobia and retro-orbital pain. Extreme weight loss may occur and recovery occurring within 2-7 days of illness onset. Case-fatality of 1-10% is observed.

Crimean-Congo Fever
Crimean-Congo fever is characterised by sudden onset of general symptoms including: weakness, fever, headache, malaise, diarrhea, and myalgia. Symptoms are similar to other VHF but may also include photosensitivity. The patient may develop mood swings and aggressive behaviours. In 2-4 days this may be replaced by exhaustion, depression, and lassitude. Abdominal pain may be localised to the upper right quadrant and hepatomegaly may occur. Petechiae may occur on skin and internal mucosal surfaces, chest, and abdomen. Crimean-congo fever has a case-fatality of 30% and average recovering occurs at 10 days.

Epidemiology

Occurrence

VHFs are found mainly in tropical regions especially central and West Africa. Rift Valley fever is seen mainly in sub-saharan Africa but outbreaks have occurred in Somalia, Kenya, Egypt, and Saudi Arabia.

Reservoir

Crimean-Congo fever is carried by ticks and it, along with Rift Valley fever can be found in local mammals. Lassa fever is found mainly in rodents. The reservoir for Ebola-Marburg is largely unknown. It may be primates and large rodents. Rift-valley fever is found in mosquitoes.

Transmission

Rift Valley and Crimean-Congo can be transmitted by bites from insect vectors or being exposed to infected animal blood, tissues, or fluids. Lassa fever is contracted by contact with aerosol of physical excreta from infected rodents. Individuals may become infected with Rift Valley and Crimean Congo if they come in direct personal contact with blood or excreta from infected patients. It is believed that Ebola Marburg is first contracted by handling carcasses of dead infected animals. Ebola-Marburg, however, has a high communicability through infected blood, secretions, organs, or semen. Risk is highest during vomiting, hemorrhaging, and diarrhea phases as well as during burial of dead because of a lack of precautions. Ebola-Marburg is more highly communicable than the others potentially because of the severity of the illness and the amount of vomit, excreta, and blood produced.

Incubation Period

VHFs have variable incubation periods: Ebola-Marburg disease - 2-21 days; Lassa fever - 6-21 days; Crimean-Congo fever - 5-13 days; and Rift Valley - 2-6 days. In most cases, onset occurs sooner rather than later.

Communicability

Technically the virus is communicable for as long as it can be found in the blood. Communicability increases with the amount of blood, excreta, and vomit produced. Ebola virus has been found in semen 61 days after onset of the illness.

Diagnosis

Case confirmation is based on findings consistent with the above listed case definition.

Control Measures

Management of Case

Generally medical care is supportive. Few treatments have been found to have any effect. Lassa fever can be treated with ribavirin within the first 6 days of illness. Oral rehydration is important. For Lassa and especially Ebola-Marburg, strict isolation should be imposed. Extreme precautions should be taken with blood, septum, and excreta of infected individuals.

Management of Contacts

Contacts require identification and surveillance. Isolation is not required. Body temperature should be monitored. If it goes above 38.8 degrees Celsius, an individual should be hospitalized immediately.

Management of Outbreaks

Because VHFs are not endemic in Canada and can be potentially serious, isolation should prevent further spread because infected humans would be the only hosts. In the case of suspected bioterrorism please consult the Newfoundland and Labrador Bioterrorism Response Handbook.

A single case of inhalation VHF should result in investigation. Notification of one case would result in a national response. The response to an outbreak would involve deployment of an expert team from Health Canada's Center for Emergency Preparedness and Response Division. Further health direction would come from this team. When deliberate use is suspected than specific measures should be taken and criminal investigation authorities should also be notified and included in planning.

Preventive Measures

Prevention involves careful monitoring of international travel. Educating travelers of potential illness could speed diagnosis time

Reporting Requirements and Procedures

- Physicians and laboratories report notifable diseases immediately for list A and within 4 days for list B, aggregate weekly for list C to the Regional Medical Officer of Health (RMOH)
- The RMOH office initiates coordinated response including contact training as indicated for a specific disease
- The RMOH office reports to the Provincial Public Health through electronic reporting system

- If an outbreak has been identified an outbreak report is completed and sent to the Provincial Public Health.
- The RMOH office will notify local health professionals and others deemed as necessary
- Provincial Public Health
  - Reports cases to Public Health Agency of Canada
  - Provides analysis and reports to RHA's in the Communicable Disease Report (CDR)