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Traveler Information

VIRAL HEMORRHAGIC FEVERS

This article discusses **Lassa fever**, **Marburg virus disease**, and **Crimean-Congo hemorrhagic fever**.

For information on **Ebola**, see *Ebola Virus Disease* in the Travax Medical Library.

INTRODUCTION

The term "hemorrhagic fever" is often used to group together viral infections that have little in common except that they are rare, severe, have a high death rate, and, in some cases, may be hemorrhagic. This group includes Lassa fever, Marburg and Ebola virus diseases, and Crimean-Congo hemorrhagic fever. (Yellow fever and dengue may also be complicated by hemorrhage; see *Yellow Fever* and *Dengue*.)

DISEASE INFORMATION**Lassa Fever*****Epidemiology***

Lassa fever is caused by a virus that is common in Guinea, Sierra Leone, Liberia, and parts of Nigeria; however, because the rodent species that carry the virus are found throughout West, Central, and East Africa, the disease may extend to other countries in the region.

Human infections tend to occur in clusters, mostly in rural villages; however, urban cases have begun to emerge. Infections can occur at any time of the year, but most occur during the dry season between January and May.

Hospitals in endemic areas have been the source of several large outbreaks of Lassa fever, due to poor hygienic practices. In hospitals in developed countries using routine isolation procedures there have been no secondary cases. Although imported cases have occurred, none have resulted in secondary cases. Several of the imported cases occurred in health care professionals who had cared for ill patients in Africa.

Transmission

A common rat species is the natural host of the Lassa fever virus. The rat itself is not significantly affected by the infection but it can transmit the virus through its waste and saliva.

Transmission to humans occurs most often by direct contact with rat urine, feces, or saliva deposited on surfaces or in food or water. Cuts and scratches in the skin are probably the most important portal of entry.

Less common forms of transmission include breathing infected dust, eating rodent meat, and accidental exposure among laboratory workers. Person-to-person transmission occurs most commonly in hospital or village settings by contact with infected blood, secretions, contaminated needles or other medical equipment, or by respiratory aerosols. It is also possible for the disease to be transmitted sexually.

Symptoms

Lassa fever has a gradual onset over several days. Symptoms may include fever, general discomfort, muscle pain, dry cough, and chest and abdominal pain. Headache and sore throat are common, and the tonsils may secrete a fluid. As the illness progresses, facial and neck edema and difficulty breathing develop. Bleeding occurs in less than one-third of cases, but minor bleeding can often be observed from the gums, gastrointestinal tract, and urinary tract. Hypotension and shock lead to death. A large proportion of persons infected with Lassa virus have few or no symptoms.

The overall death rate is 1%, but among hospitalized patients it can be as high as 15%. The disease is especially severe late in pregnancy, with maternal death and/or fetal loss occurring in more than 80% of cases during the third trimester.

In non-fatal cases, the fever starts to fall 2-3 weeks after symptoms first appear, followed by a recovery period during which complications may develop. The most common long-term consequence is deafness, which occurs in about one-third of cases, regardless of the severity of initial illness.

Risk Factors

Infection is rare among travelers and expatriates in endemic areas.

- Risk is minimal for travelers staying in up-market accommodations and hotels in large towns, where the likelihood of coming into direct contact with rodents is small.
- Travelers at greatest risk are adventure travelers and long-term visitors and expatriates who are likely to stay in substandard accommodations. However, few tourists, even backpackers, live in rural West African village huts.
- Groups recently at particular risk have been peacekeepers, members of foreign armed forces, and members of international relief and non-governmental organizations in conflict areas (e.g., Sierra Leone and Liberia).
- Expatriate health care workers are also at significant risk due to limited understanding of the biology and epidemiology of the virus by local health authorities and to limited application of standard hygienic precautions and isolation procedures in facilities that care for infected patients.

Marburg Virus Disease**Epidemiology**

Marburg virus disease (MVD) first appeared in 1967 in simultaneous outbreaks in Marburg and Frankfurt, Germany and in Belgrade, Serbia, where laboratory and animal workers were exposed to tissues from imported African green monkeys. Although rare, MVD outbreaks have occurred in Angola, Democratic Republic of the Congo, and Uganda. Confirmed cases have also been reported from Kenya, South Africa, and Zimbabwe. Given the wide distribution of the natural host, the precise geographic range of MVD is unknown.

Transmission

The natural reservoir of Marburg virus is the African fruit bat. Initial human infection most likely results from direct contact with feces or aerosols in mines or caves inhabited by bat colonies. Non-human primates are also affected; therefore, transmission can occur through contact with body fluids or handling of infected animals.

Person-to-person transmission (direct contact with infected persons or their body fluids/secretions) is considered the principal mode of transmission. Traditional burial practices and under-protected family and health care settings are recognized sources of infections.

Symptoms

The incubation period is 3-10 days. Symptoms usually begin abruptly with high fever, headache, muscle aches, and general discomfort. The throat is sore and swollen but does not secrete fluids, as with Lassa fever. Abdominal pain, cramps, diarrhea, and vomiting develop by the third day and bleeding begins after 5-7 days, leading rapidly to shock and death.

Fatal cases usually have some form of bleeding, often from multiple areas. Death occurs most often between 8 and 9 days after symptom onset. The case fatality is 24-88%.

Risk Factors

Risk is extremely low for general travelers and business travelers. Risk is also low for persons visiting friends and relatives, unless the traveler has direct physical contact with a sick or dead infected person or animal or their blood or body fluids.

Risk is high for unprotected health care workers and volunteers. Implementation of recommended precautions reduces risk, although infections have occurred despite stringent precautions, including modern personal protective gear.

Crimean-Congo Hemorrhagic Fever (CCHF)

Epidemiology

The virus causing CCHF is widespread south of 50° N in the Old World (Europe, Asia, and Africa). In Africa, infection with CCHF virus has been reported from the coastal countries of West and sub-Saharan Africa, central, southern, and eastern Africa, Madagascar, and Egypt. In Europe and the Middle East, a belt of infection stretches from the countries of Eastern Europe east to Russia and south across Turkey, the Middle East, and central Asia as far as Kazakhstan, Pakistan, and India. Turkey, Iran, southern Russia, and Uzbekistan report more than 50 cases annually. There is no evidence of human infections in China and Southeast Asia.

Transmission

Humans become infected by tick bites or through handling infected livestock. Most human cases occur rurally, among farming and herding communities.

CCHF virus has a natural reservoir in a variety of small wild mammals and ticks that transmit the infection among these mammals and also to sheep, goats, cattle, and ostriches. The infection is mild in mammals but may be severe in humans.

Symptoms

Symptoms are not usually present with CCHF infection. Those who do have symptoms have a sudden onset of high fever that lasts for about 5 days, headache, muscle aches, and dizziness. On the third to fifth day of illness, bleeding begins in skin and mucosa, followed by bleeding in internal organs. For those who survive, convalescence is slow, and various complications can occur.

Risk Factors

Outdoor activities in endemic areas are a risk factor for tick exposure.

In principle, campers in endemic areas might be at risk of infected tick bites, but there have been very few reports of CCHF in travelers.

Health care workers are at risk when nursing CCHF patients in a hospital setting without strict barrier nursing procedures.

The major risk groups are farmers, veterinarians, and abattoir (slaughterhouse) workers in endemic areas; most of the affected cases deal with agriculture and/or domestic animal husbandry and slaughtering activities.

Ritual slaughter of viremic animals by travelers engaging in religious ceremonies in endemic areas is also a risk.

PREVENTION

No vaccine or drugs are currently available to prevent these diseases, so it is important that travelers avoid situations that put them at

risk.

- Lassa fever: Avoid contact with rodents, and avoid staying or eating in accommodations with known or suspected rodent infestations when traveling or living in risk areas. Store food in rodent-proof containers and keep the home clean, in order to discourage rodents from entering the home.
- Marburg virus disease: Avoid eating unidentified or undercooked "bush meat." Do not enter caves or mines in Africa where bats may live.
- CCHF: Take standard tick precautions if camping in endemic countries where there is evidence of livestock (see *Insect Precautions*).
- Travelers who must be admitted to the hospital for any reason while in risk areas should insist on a private room and the use of disposable equipment only. They should consider seeking evacuation as soon as possible.
- Expatriate health care workers who expect to be in close contact with potential cases of Lassa or other viral hemorrhagic fevers should bring adequate protective gear and make arrangements to have additional supplies delivered as needed. Practice strict barrier protection when caring for patients with undiagnosed febrile illness.

NEED FOR MEDICAL ASSISTANCE

Persons who feel ill or have an abrupt onset of fever or severe malaise after traveling through areas of risk should seek immediate medical evaluation and care.

An antiviral called ribavirin, if administered within a few days after onset of illness, has been shown to decrease death rates significantly for Lassa infection. Ribavirin has also been used to treat severe cases of CCHF.

Antiviral agents are ineffective against MVD, and treatment is limited to general supportive therapy.

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