

Marburg Virus

Background

Marburg hemorrhagic fever is a rare, severe type of hemorrhagic fever which affects both humans and non-human primates. Caused by a genetically unique zoonotic RNA virus of the filovirus family, its recognition led to the creation of this virus family. The five species of Ebola virus are the only other known members of the filovirus family. Marburg is a 800-100 nm elongated filamentous virion, is single stranded, and composed of negative sense RNA.

Marburg virus was first recognized in 1967, when outbreaks of hemorrhagic fever occurred simultaneously in laboratories in Marburg and Frankfurt, Germany and in Belgrade, Yugoslavia (now Serbia). A total of 37 people became ill; they included laboratory workers as well as several medical personnel and family members who had cared for them. The first people infected had been exposed to African green monkeys or their tissues. In Marburg, the monkeys had been imported for research and to prepare polio vaccine.

Agent Criteria

Infectious Dose: 1-10 organisms

Stability: Susceptible to 1% sodium hypochlorite, 2% glutaraldehyde, formaldehyde. Susceptible to UV irradiation and heat. Can survive in blood specimens for 2 weeks at room temperature; does not survive for long periods after drying.

Shedding patterns (for animal pathogens): Unknown, possible link to the central African bat reproductive cycle.

Incubation Period: 3-7 days, (other sources 5-10 days)

Mortality Rate: 25% case fatality rate

Morbidity Rate:

Duration of Illness: recovery will begin within 7-10 of clinical onset, recovery can take 5 weeks or more

Severity of Illness: Sudden onset with high fever, malaise, myalgias, headache, vomiting, diarrhea; maculopapular rash, renal and hepatic involvement and hemorrhagic diathesis; involvement of liver, pancreas, kidney, CNS and heart; leukopenia and thrombocytopenia; marked toxicity often leading to shock and death

Duration of Infection: One source notes presence of the virus 3-4 months after clinical recovery

Long term effects after infection: Recovery from Marburg hemorrhagic fever may be prolonged and accompanied by orchitis (inflammation of one or both testes), recurrent hepatitis (inflammation of the liver), transverse myelitis (inflammation of the spinal cord), uveitis (inflammation of the eye), or parotitis (inflammation of the parotid gland).

Allergen (yes/no): No

Carcinogenic/mutagenic (yes/no): No

Abortogenic (yes/no): Yes

Toxin Production: No

Drug Resistance: No known treatment

Infection Mitigation Measures:

For human pathogens

Immunization: No

Prophylaxis: No

Post Infection Treatment: Treatment is directed at maintaining renal function and electrolyte balance and combating hemorrhage and shock; transfusion of convalescent serum may be beneficial

Existence of Diagnostic tests: viral isolation or serology (Antigen-capture enzyme-linked immunosorbent assay (ELISA) testing, IgM-capture ELISA, real-time polymerase chain reaction (RT-PCR))

For animal pathogens

Detection Possible: Yes

Culling: No

Prophylaxis: No

Immunization: No

Post Infection Treatment: No

Routes of Infection:

Inhalation: Yes

Ingestion: No

Percutaneous: Inoculation with infected blood or secretions

Contact: Contact with infected blood, secretions, organs, or semen

Vector-Borne: No

Natural Routes of Infection:

Inhalation: No

Ingestion: No

Percutaneous: Yes

Contact: Yes

Vector-Borne: No

Sexual Transmission: Yes

Vertical Transmission: None recorded

Communicability:

Human to Human: Through droplets of body fluids, or direct contact with persons, equipment, or other objects contaminated with infectious blood or tissues, especially in hospital settings.

Human to Animal: No evidence

Animal to Animal: Yes

Animal to Human: Yes

Multiple Species: Humans and Monkeys

Where is it present: Uganda, Zimbabwe, Kenya, Democratic Republic of the Congo

Where is it endemic: Actual animal host remains unknown, outbreaks in humans are sporadic.