



International Journal of Research in Pharmacy and Life Sciences

CODEN (USA): IJRPL | ISSN: 2321-5038

Journal Home Page: www.pharmaresearchlibrary.com/ijrpls



REVIEW ARTICLE

Review Article on Lassa Fever

V. Saichitraprathyusha*

Ratnam Institute of Pharmacy, Pidathapoluru, Nellore District, Andhra Pradesh, India

ABSTRACT

Lassa fever is endemic in west Africa, where it probably kills several thousand people each year. Lassa fever is a viral haemorrhagic fever transmitted by rats. It has been known since the 1950s, but the virus was not identified until 1969, when two missionary nurses died from it in the town of Lassa in Nigeria. Found predominantly in west Africa, it has the potential to cause tens of thousands of deaths. Even after recovery, the virus remains in body fluids, including semen. With access to the region improving, the opportunity, and the need, to improve our understanding of this disease are increasing. The risk of importing the disease into the UK is small but real, and it continues to be a worldwide concern among public health officials. This article summarizes its epidemiology and clinical presentation, and discusses current theories of its pathogenesis.

Keywords: viral, haemorrhagic, predominantly, semen, pathogenesis

ARTICLE INFO

*Corresponding Author

V. Saichitraprathyusha
Ratnam Institute of Pharmacy,
Pidathapoluru, Nellore District,
Andhra Pradesh, India



ARTICLE HISTORY: Received 11 May 2021, Accepted 25 August 2021, Available Online 19 October 2021

©Production and hosting by International Journal of Research in Pharmacy and Life Sciences. All rights reserved.

This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

Citation: V. Saichitraprathyusha. Review Article on Lassa Fever. *Int. J. Res. Pharm, L. Sci.*, 2021, 9(1): 44-47.

CONTENTS

1. Introduction.....	44
2. Epidemiology.....	45
3. Signs and Symptoms.....	40
4. Conclusion.....	46
5. References.....	46

1. Introduction

Lassa fever, a viral haemorrhagic fever with symptoms similar to those of Ebola virus disease, is endemic in much of West Africa and usually sparks a seasonal outbreak from December to March. Lassa fever is a viral infection carried by the multimammate rat *Mastomys natalensis* (*M. natalensis*). This is one of the most common rodents in equatorial Africa, found across much of sub-Saharan Africa. Humans usually become infected with Lassa virus from exposure to urine and faeces of infected *Mastomys*

rats. Lassa virus may also be spread between humans through direct contact with the blood, urine, faeces, or other bodily secretions of a person infected with Lassa fever. Lassa fever occurs in all age groups and both sexes. Persons at greatest risk are those living in rural areas where *Mastomys* are usually found, especially in communities with poor sanitation or crowded living conditions. The disease is endemic to a number of West African countries. Rough estimates suggest there are between 100,000 and

300,000 cases Trusted Source of Lassa fever each year in West Africa, and approximately 5,000 deaths due to the disease. In some areas of Liberia and Sierra Leone, 10 to 16 percent Trusted Source of all hospital admissions are due to Lassa fever, indicating a serious and widespread impact in those areas. In 2015, a person returning from Liberia to the US. received a diagnosis Trusted Source of Lassa fever. International travel has increased the risk of diseases spreading from one country to another. Lassa fever was first discovered in Nigeria, when two missionary nurses became ill with the virus in 1969. Its name is derived from the village of Lassa, where it was first documented. Lassa fever mainly occurs in Sierra Leone, Liberia, Guinea, and Nigeria. However, the Mastomys rat is common in neighboring countries, so these areas are also at risk.

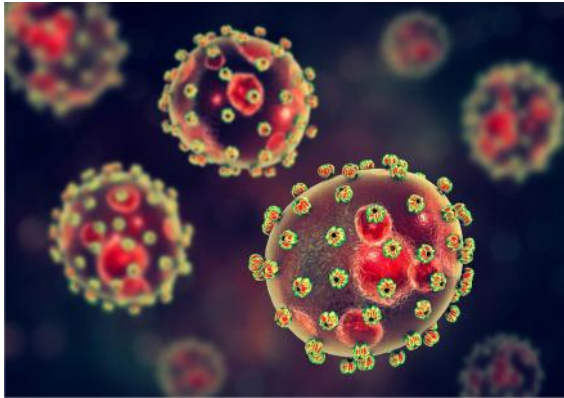


Figure 1

- It is most common in Sierra Leone, Liberia, Guinea, Nigeria.
- Symptoms are varied and include pulmonary, cardiac, and neurological problems.

Causes:

Person-to-person contact is possible via blood, tissue, secretions or excretions, but not through touch. Sharing needles may spread the virus, and there are some reports of sexual transmission. Once a Mastomys rat is infected with the virus, it can excrete. Trusted Source the virus in its feces and urine, potentially for the rest of its life. The rats live in and around human habitation, and they often come into contact with foodstuffs. Sometimes people eat the rats, and the disease can be spread during their preparation.

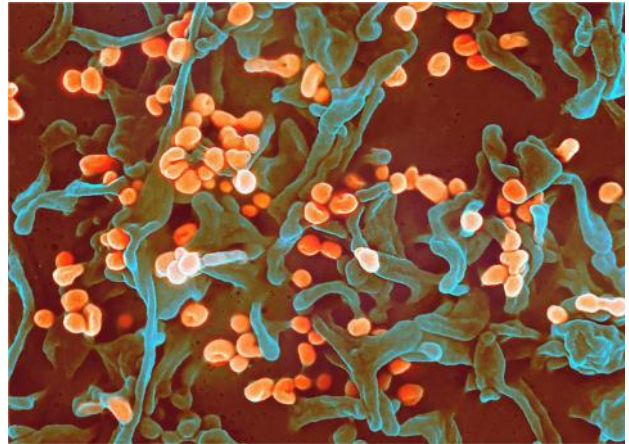


Figure 2

2. Epidemiology

- Lassa fever is caused by a single stranded RNA virus and is a disseminated systemic primary viral infection. The prevalence of antibodies to the virus in the population is 8-52% in Sierra Leone, 4-55% in Guinea, and 21% in Nigeria. Seropositivity has also been found in the Central African Republic, Democratic Republic of the Congo, Mali, and Senegal. The specimens from 137 patients with Lassa fever. The probability of fatal disease increased significantly with the level of viremia measured either on admission or during the course of illness. The odds ratio of death in patients with viremia greater than 10 TCID50/ml was 3.7 (90% confidence interval, 1.9-7.2).
- Fewer than 3% of patients were viruric during acute illness, and virus was isolated from three of three samples of cerebrospinal fluid. On admission, 53% of patients had IgG antibodies, and 67% had IgM antibodies. Recovery was not associated with the presence of either IgG or IgM. Virus was isolated from greater than 100 serum specimens that also contained high titers of IgG.

Facts of lassa fever:

- Lassa fever causes around 5,000 deaths per year.
- It is spread through the feces and urine of the multimammate rat (*Mastomys natalensis*)

3. Signs and Symptoms

Mild symptoms include slight fever, general malaise and weakness, and headache. In 20% of infected individuals, however, disease may progress to more serious symptoms including hemorrhaging (in gums, eyes, or nose, as examples), respiratory distress, repeated vomiting, facial swelling, pain in the chest, back, and abdomen, and shock. Neurological problems have also been described, including hearing loss, tremors, and encephalitis. Death may occur within two weeks after symptom onset due to multi-organ failure.

The most common complication of Lassa fever is deafness. Various degrees of deafness occur in approximately one-third of infections, and in many cases hearing loss is permanent. As far as is known, severity of the disease does not affect this complication: deafness may develop in mild as well as in severe cases. The death rates for women in the third trimester of pregnancy are particularly high. Approximately 15%-20% of patients hospitalized for Lassa fever die from the illness. However, only 1% of all Lassa virus infections result in death. Lassa fever is also associated with occasional epidemics, during which the case-fatality rate can reach 50% in hospitalized patients.

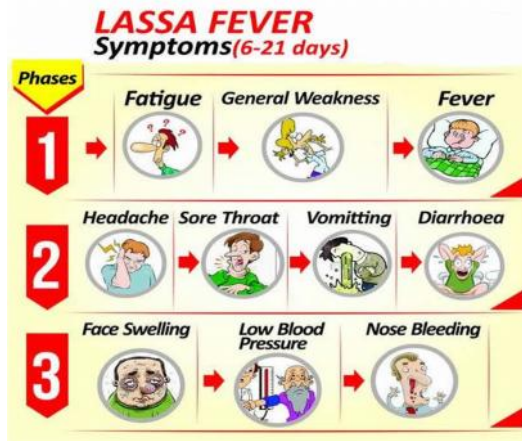


Figure 3

Transmission:

The reservoir, or host, of Lassa virus is a rodent known as the “multimammate rat” (*Mastomys natalensis*). Once infected, this rodent is able to excrete virus in urine for an extended time period, maybe for the rest of its life. Transmission of Lassa virus to humans occurs most commonly through ingestion or inhalation. *Mastomys* rodents shed the virus in urine and droppings and direct contact with these materials, through touching soiled objects, eating contaminated food, or exposure to open cuts or sores, can lead to infection. *Mastomys* rodents are sometimes consumed as a food source and infection may occur when rodents are caught and prepared. Contact with the virus may also occur when a person inhales tiny particles in the air contaminated with infected rodent excretions. This aerosol or airborne transmission may occur during cleaning activities, such as sweeping. Casual contact (including skin-to-skin contact without exchange of body fluids) does not spread Lassa virus. Person-to-person transmission is common in health care settings (called nosocomial transmission) where proper personal protective equipment (PPE) is not available or not used. Lassa virus may be spread in contaminated medical equipment, such as reused needles.



Figure 4

Diagnosis:

Lassa fever is most often diagnosed by using enzyme-linked immunosorbent serologic assays (ELISA), which

detect IgM and IgG antibodies as well as Lassa antigen. Reverse transcription-polymerase chain reaction (RT-PCR) can be used in the early stage of disease. Immunohistochemistry, performed on formalin-fixed tissue specimens, can be used to make a post-mortem diagnosis.

Treatment:

Ribavirin, an antiviral drug, has been used with success in Lassa fever patients. It has been shown to be most effective when given early in the course of the illness. Patients should also receive supportive care consisting of maintenance of appropriate fluid and electrolyte balance, oxygenation and blood pressure, as well as treatment of any other complicating infections.

Risk factor exposure:

Risk of exposure may also exist in other west African countries where *Mastomys* rodents exist. Hospital staff are not at great risk for infection as long as protective measures and proper sterilization methods are used.

Prevention:

Putting food away in rodent-proof containers and keeping the home clean help to discourage rodents from entering homes. Using these rodents as a food source is not recommended. When caring for patients with Lassa fever, further transmission of the disease through person-to-person contact or nosocomial routes can be avoided by taking preventive precautions against contact with patient secretions (called VHF isolation precautions or barrier nursing methods). Such precautions include wearing protective clothing, such as masks, gloves, gowns, and goggles; using infection control measures, such as complete equipment sterilization; and isolating infected patients from contact with unprotected persons until the disease has run its course.

Vaccines:

Production of a combined, single dose vaccine against yellow fever and Lassa fever has been proposed. The cost and logistical problems of delivering it would be huge, particularly since fewer than 20% of districts in the countries studied achieve 80% uptake of childhood vaccination. Use for visitors from the United Nations, non-governmental organisations, and business communities might make it financially viable, even though it is the most expensive of the possible control strategies.

4. Conclusion

The conclusion from these studies is that Lassa fever occurs as an endemic disease and accounts for a high proportion of febrile illnesses in endemic areas, where the incidence increases in the dry season.

5. References

[1] Merlin. ‘Licking’ Lassa fever: a strategic review. London: Merlin, 2002. (www.merlin.org.uk/uploads/files/pr/Lassa%20Fever%20Strategy%202.pdf)

[2] Chen JP, Cosgriff TM. Hemorrhagic fever virus-induced changes in hemostasis and vascular biology. *Blood Coagul Fibrinolysis* 2000;11: 461-83.

- [3] Tomori O, Fabiyi A, Sorungbe A, Smith A, McCormick JB. Viral hemorrhagic fever antibodies in Nigerian populations. *Am J Trop Med Hyg* 1988;38: 407-10.
- [4] Wilson M. Infectious diseases: an ecological perspective *BMJ* 1995;311: 1681-4.
- [5] Bausch D. Lassa fever in Sierra Leone. London:Merlin, 2000.
- [6] Ter Meulen J, Lenz O, Koivogui L, Magassouba N, Kaushik SK, Lewis R, et al. Short communication: Lassa fever in Sierra Leone: UN peacekeepers are at risk. *Trop Med Int Health* 2001;6: 83-4.
- [7] McCarthy M. USA moves quickly to push biodefence research. *Lancet* 2002;360: 732.
- [8] Fisher-Hoch S, McCormick JB, Sasso D, Craven RB. Hematologic dysfunction in Lassa fever. *J Med Virol* 1988, 26: 127-35.
- [9] Fisher-Hoch SP, McCormick JB. Towards a human Lassa fever vaccine. *Rev Med Virol* 2001, 11: 331-41.
- [10] Ter Meulen J, Lenz O, Koivogui L, Magassouba N, Kaushik SK, Lewis R, et al. Short communication: Lassa fever in Sierra Leone: UN peacekeepers are at risk. *Trop Med Int Health* 2001;6: 83-4.
- [11] Price ME, Fisher-Hoch SP, Craven RB, McCormick JB. A prospective study of maternal and fetal outcome in acute Lassa fever infection during pregnancy. *BMJ* 1988, 297: 584-7.
- [12] Cummins D, McCormick JB, Bennett D, Samba JA, Farrar B, Machin SJ, et al. Acute sensorineural deafness in Lassa fever. *JAMA* 1990;264: 2093-6.
- [13] Ter Meulen J, Lukashovich I, Sidibe K, Inapogui A, Marx M, Dorlemann A, et al. Hunting of peridomestic rodents and consumption of their meat as possible risk factors for rodent-to-human transmission of Lassa virus in the Republic of Guinea. *Am J Trop Med Hyg* 1996;55: 661-6.
- [14] Johnson KM, McCormick JB, Webb PA, Smith ES, Elliott LH, King IJ. Clinical virology of Lassa fever in hospitalized patients. *J Infect Dis* 1987, 155: 456-64.
- [15] Healing T, Gopal R. Report on an assessment visit to Sierra Leone, April 12th-30th 2001. London: Merlin, 2001.