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Lassa Fever Situation Report For Week 1 to Week 15 From 2021 to 2023 in Nigeria: A Review

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Abstract

Lassa fever is a viral hemorrhagic fever caused by Lassa virus. The Lassa virus is an enveloped single-stranded, non-lytic bi-segmented negative-stranded RNA virus belonging to the family Arenaviridae. Lassa fever is relatively common or endemic in West Africa or particularly in countries such as Benin, Ghana, Guinea, Liberia, Mali, Sierra Leone, and Nigeria. Humans usually become infected with the virus through exposure to food or household items contaminated with the urine or faeces of infected multimammate rat while spread of the disease between or among persons is by direct contact. The disease cases rises to the peak during the dry season particularly between December to April and falls in May annually. The incubation period for the disease is between 1 – 3 weeks, which can lead to spread from region to region. This review focuses on the secondary data for the epidemiological trend of the Lassa fever disease in Nigeria. The rodent host and reservoir is the primary driver of the Lassa fever seasonal trends. Therefore, to control the disease, it is necessary to control the rodent host by killing it. This can be achieved through the use of trap, poisoned bait and interference with their breeding by killing the newly born off springs.

Keywords: Lassa fever, multimammate, report, review

INTRODUCTION

Lassa fever is a viral hemorrhagic fever caused by Lassa virus (WHO, 2016). The Lassa virus is an enveloped single-stranded, non-lytic bi-segmented negative-stranded RNA virus belonging to the family Arenaviridae (Inegbenebor et al., 2009; Ezeomah et al., 2019; Akhiwu et al., 2018; Torriani et al., 2017). The virus was first reported in the town of Lassa in Bornu State, Nigeria (WHO, 2016). Lassa fever is relatively common or endemic in West Africa or particularly in countries such as Benin, Ghana, Guinea, Liberia, Mali, Sierra Leone, and Nigeria (WHO, 2016; Ogbu et al., 2007). It has been reported that about 300,000 to 500,000 cases occur yearly with about 5000 deaths recorded per year (Ogbu et al., 2007; Houlihan & Behrens, 2017). Humans usually become infected with the virus through exposure to food or household items contaminated with the urine or faeces of the infected multimammate rat (WHO, 2016) while spread of the disease between or among persons is by direct contact (WHO, 2016; Asogun et al., 2019). It has been reported that the virus uses a two step process to enter cells (Science Daily, 2014). The results show that the mechanism by which the virus causes the infection is more complicated than previously known and could lead to new approaches for the prevention of the disease (Science Daily, 2014). The researchers stated that the virus may require multiple receptors for delivering its viral load in order to cause infection. Torriani et al. (2017) stated that the first receptor was identified as dystroglycan (DG), a ubiquitously expressed conserved cellular receptor for extra cellular matrix (ECM) protein which is found in most human tissues where it provides molecular link between the ECM and the actin cytoskeleton. When the virus attaches itself to its receptor on the cell surface, it is first transported to lysosome inside the cell (Torriani et al., 2017). The

lysosome helps to break down different variety of molecules. Thus, in order to infect the cell, the virus must escape the lysosome, which is achieved by the virus getting attached to a protein called lysosome-associated membrane protein 1 (LAMP 1) as a late endosomal entry factor. The acidic conditions of the late endosome, causes dissociation of the virus from the first receptor and then fuses with LAMP 1 (Torriani et al., 2017). This review is focused on the comparison of the Lassa fever situation report for week 1 to week 15 from 2021 to 2023, peak periods. In addition, the signs and symptoms, diagnosis, treatment and prevention of the disease are also included.

Peak period

The disease cases rise to the peak during the dry season particularly between December to April and falls in May annually (Adeiza & Chinenye, 2019; WHO, 2022). The incubation period for the disease is between 1 – 3 weeks, which can lead to spread from region to region (Grace, et al, 2021). The rodent host and reservoir is the primary driver of the Lassa fever seasonal trends (WHO, 2019).

Table 1: Summary of Lassa fever Situation Report in Nigeria, Cumulative from Epi week 1 – 15, from 2021 – 2023.

Reporting period	**Suspected cases**	**Confirmed cases**	**Probable cases**	**Deaths (confirmed cases**	**Case fatality ratio (CFR)**	**States and LGAs affected (confirmed areas**
2021 cumulative (week 15)	1592*	247*	3	50*	20.2%	*State(s): 14 *LGA(s): 52
2022 cumulative (week 15)	4127*	733*	31	139*	19.0%	*State(s): 23 *LGA(s): 94
2023 cumulative (week 15)	4702*	877*	5	152*	17%	*State(s): 26 *LGA(s): 101

Source: WHO (2021, 2022 & 2023)

From the Table 1 above, it was observed that there is increase in suspected cases, confirmed cases and death cases for the Lassa fever cumulative result from Epi Week 1 – 15, from 2021 – 2023. Also, it was observed that the disease is spreading at a fast rate from state to state and local government to local government. If urgent actions are not taken or implemented, the disease will spread throughout the country in the nearest future. The methods used to derive this figures include surveillance, detection, monitoring of cases and outbreaks, laboratory testing and case management (WHO, 2023).

Table 2: Showing percentage of confirmed cases and major states affected in Nigeria

Year	Confirmed cases	Death (confirmed cases)	% of confirmed cases	Major states
2021	247	50	79%	Edo 44% Ondo 28% Taraba 7%
2022	733	139	68%	Ondo 28 % Edo 24% Bauchi 16%
2023	877	152	72%	Ondo 32% Edo 29% Bauchi 11%

Source: WHO (2021, 2022 & 2023)

Table 2 above shows the three major states with the cases for the period under review.

Signs and symptoms

The symptoms usually show up one to three weeks after infection. The mild ones manifest in form of slight fever, tiredness/weakness, and headache (Starkman, 2023). In about twenty percent of the cases, the disease manifest more serious symptoms such as bleeding from gums in the mouth, eyes or nose, difficulty in breathing, vomiting, swelling around the face, pain in the chest, back and belly, shock (Starkmam, 2023). The predominant age group affected is 21-30 years. Lassa fever is particularly severe in pregnant women in the third trimester; the foetus dies in about 95% of cases (WHO, 2023). The death rate for women in the late stages of pregnancy could be up to 30%. About a one-third of those who get infected end up with some form of deafness as a complication of the illness (Starkman, 2023). Overall, only about one percent of those who get infected with the disease eventually die (Starkmam, 2023; WHO, 2023).

Diagnosis

It is usually diagnosed through blood test. In the early stages of the disease, a nose or throat swab could be helpful to detect the Lassa fever virus (Starkman, 2023). Cleveland (2023) reported that Lassa fever can be diagnosed by testing samples of body fluids for the presence of the virus. These tests include blood test, throat swab, urinalysis, lumbar puncture (spinal tap). It is mostly diagnosed using enzyme-linked cimmunosorbent serologic assay (ELISA), which detects IgM and IgG antibodies as well as the Lassa virus antigen. Reverse transcription polymerase chain reaction (RT-PCR) can be used in the early stages of the disease. The virus can also be isolated by cell culture (WHO, 2017).

Treatment

Ribavirin, an antiviral drug, has proven to be successful in the treatment of Lassa fever (CDC, 2014). It has been shown to be most effective when administered in the early stages of the disease. Patients should also be given supportive care in form of maintenance of appropriate fluid and electrolyte balance, oxygenation and blood pressure, as well as treatment of any other complicating infections (CDC, 2014).

Prevention

According to CDC (2014) the following measures can be carried out to check the spread of the disease. These include: (1) avoid contact with rodents, store food in rodent-proof containers and keep the home clean to discourage rodents from entering the homes, (2) avoid eating rodents, set traps around the homes to kill and reduce their population, (3) wearing of personal protective clothing such as masks, gloves, gowns and goggles, (4) use of infection control measures, such as complete equipment stabilization, and isolation of infected persons from contact with unprotected ones. Also educating people in high risk areas on how to control and prevent the disease.

Recommendations

According to Richmind and Baglole (2003) the following measures should be adopted:

- International collaboration over research
- A map with complete epidemiological and clinical story.
- Involvement of the communities affected.
- Effective and affordable diagnostic kits and treatments.
- Efficient and effective specialist treatment centers.
- Development of an effective and affordable vaccine to control the infection in its natural habitat, protect foreign visitors and deter the use of the virus as an agent of biological welfare.
- In addition, there should be enlightenment of the people particularly during the peak period of the disease outbreak because of the festivals that attract a lot of people to the rural areas within the peak period.
- People should be discouraged from hunting and eating rodents at the festive period within the peak period of the disease.

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