

ORIGINAL ARTICLE

Profile of Confirmed Cases during Lassa fever Outbreak in Etsako West Local Government Area, Edo State

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ABSTRACT

Background: Lassa fever (LF) is an acute viral haemorrhagic fever caused by the Lassa virus. The objective of this study was to describe the profile of confirmed cases of Lassa fever during an outbreak in Etsako West Local Government Area, Edo State.

Methods: A descriptive review of records of cases of Lassa fever between 1st of January to 4th of March, 2019 was done. Confirmation of cases was done using reverse transcriptase polymerase chain reaction. Data analysis was by Statistical Package for Social Science (SPSS) version 20 and descriptive statistics was done.

Results: Out of a total of 150 suspected cases of Lassa fever recorded during the period, 63 (42.0%) were confirmed. Among the confirmed cases, the mean age was 28±16.4 years and 34 (54.0%) were males. The incidence of the disease was highest among those within the ages of 15-45 (66.7%) years. The highest proportions of confirmed cases were from Jattu 25 (39.7%) and Auchu 24 (38.1%) communities. The case fatality rate was 12 (19%).

Conclusion: The incidence of Lassa fever was highest among the productive age group with about one in five deaths recorded during the outbreak. The State Government should step-up environmental sanitation activities in Jattu and Auchu Communities in Etsako West LGA.

Keywords: Lassa fever; Disease outbreak; Surveillance; Edo State

INTRODUCTION

Lassa fever (LF) is an acute viral haemorrhagic fever caused by the Lassa virus, a member of the family of Arenaviridae, whose natural hosts are rodents of the genus *Mastomys*. First isolated in Lassa village, Borno state, Nigeria in 1969, the disease is estimated to affect 2 million people and cause 5000-10,000 deaths annually in West Africa.^{1, 2} The peri domestic multi-mamate rodent is widespread throughout West Africa, and chronically infected with the virus, which it sheds in urine and faeces, which can be aerosolized.³ Outbreaks of varying sizes and severity have been reported from Sierra Leone, Guinea, Liberia, and Nigeria, and reports of human infection have been documented in Democratic Republic of the Congo, Mali, and Senegal.⁴⁻⁶ In Nigeria, the outbreaks which were initially reported in Ekpoma, Aboh-Mbaise, Onitsha, Jos and Lafia have been extended to other areas in Ebonyi, Taraba, Nasarawa, Yobe, Rivers, Ondo and Edo States⁷

The primary mode of transmission is rodent to human through the gastrointestinal tract and respiratory system, by ingestion of food contaminated by rodent urine and excrement and inhalation of aerosolized virus.^{8, 9} Rodent population of houses is promoted by poor environmental sanitation, poor housing structure and bush burning. Secondary person to person transmission occurs in health care settings where basic infection control procedures are not maintained, and in the home, during contact with body fluids or soiled linen while rendering care to sick relatives.^{6, 10, 11}

The disease is mild or with no observable symptoms in 80% of persons infected. Clinical manifestations are seen in 20% of infections, and may present as major or minor symptoms/signs. Whereas, bleeding from the orifices, oedema of the neck/face, sub-conjunctival or conjunctival haemorrhage, jaundice, spontaneous abortion, persistent hypotension and deafness are categorized as major presentations; general malaise, headache, cough and sore throat may be categorized as minor presentations.¹² Mortality

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within the community is estimated at 1% -15%, but can rise to as high as 50% during outbreaks.^{2, 13 14}

Lassa Fever is an epidemic prone disease, whose alert and epidemic thresholds are a single suspected case and a single confirmed case respectively.¹⁵ Irrespective of the numerous outbreaks of LF in Nigeria and other African countries, there appears to be a dearth of information on the characteristic of cases within communities where these outbreaks occur. Indeed, most previous reports focus on the nosocomial aspects of it.⁷ The aim of this study was to describe the socio-demographic and clinical characteristics of Lassa fever cases during an outbreak in Etsako West Local Government Area from 1st January to 4th March 2019.

METHODOLOGY

This descriptive review of LF cases from 1st January to 4th March 2019 was carried out in Etsako West Local Government Area. This area is located in Northern Senatorial District of Edo State, Nigeria. It shares boundaries with Akoko-Edo and Etsako East Local Government Areas to the north, Esan North East Local Government Area to the south, Etsako Central and Esan South East Local Government Areas to the east and Owan East Local Government Area to the West. The LGA has 12 political wards; covers a landmass of 946km² and has a projected population of 279,397 people based on the 2006 population census of Nigeria.¹⁶ Etsako West LGA has a total of 321 villages/settlements with 28 health facilities rendering routine immunization (RI). About 30% of the population live in areas classified as hard to reach for immunization. Extra effort is often made by government to provide immunization services to this population; through outreach immunization services. Etsako West LGA is endowed with abundant agricultural and natural resources. The soil is fertile and supports farming. Over 80% of the population is engaged in agriculture. Farming remains the main stay of the indigenous people of the LGA.¹⁷ Moreover, there have recurring outbreaks of LF in Auchu and its environs in Etsako West over the last decade. Some of the communities implicated in these outbreaks include Jattu, Afashio and Ikabigbo.^{18, 19} Irrua Specialist Teaching Hospital, Irrua; which is located within the neighboring senatorial district is used as a referral centre for the management of the disease. Line listing during the epidemic is the major source of information during this review. In addition, confirmation of cases was done with the use of reverse transcriptase polymerase chain reaction (RT-PCR) in the Irrua Specialist Teaching Hospital.

The study population included all suspected cases of Lassa fever during the outbreak of Lassa fever in study area from 1st January to 4th March, 2019.

Case definitions:

Cases were appropriately designated into Alert, suspected, confirmed and probable cases using the Nigeria Center for Disease Control (NCDC) revised case definition for LF.

Alert case: Any person who has an unexplained fever (i.e. Malaria and other likely causes of fever have been ruled out), with or without bleeding OR Any person who died after an unexplained severe illness with fever and bleeding.

Suspected case: An illness of gradual onset with one or more of the following: malaise, fever, headache, sore throat, cough, nausea, vomiting, diarrhoea, myalgia (muscle pain), central chest pain or retrosternal pain, hearing loss and either history of contact with excreta or urine of rodents OR history of contact with a probable or confirmed Lassa fever case within a period of 21 days of onset of symptoms OR any person with inexplicable bleeding/hemorrhaging occurring in Etsako West Local Government Area between 1st January 2019 to 4th March 2019.

Probable case: Any suspected case as defined above but who died between 1st January 2019 and 4th March 2019 without collection of specimens for laboratory testing.

Confirmed case: Any suspected case with laboratory confirmation (positive IgM antibody, PCR or virus isolation) between 1st January, 2019 and 19th March, 2019.

Major Clinical Presentations: Bleeding mouth, nose, rectum and/vagina; Oedema of the neck and/or face; Sub-conjunctival or conjunctival haemorrhage; jaundice; abortion; deafness; persistent hypotension; confirmed contact with a patient and elevated liver transaminase.¹²

Minor clinical Presentations: General malaise; headache; retrosternal pain; Muscle or joint pain; cough; sore throat; abdominal pain; diarrhoea; proteinuria or Leucopenia <4000IU/L.¹²

Laboratory investigations: The laboratory confirmation of LF was carried out using reverse transcriptase polymerase chain reaction (RT-PCR) in the Irrua Specialist Teaching Hospital. A total of 150 blood samples were collected and transported to the laboratory, using the triple packaged containers.

Table 1: Demographic characteristics of confirmed cases of Lassa fever from 1st January to 4th March 2019

Variables	n (%)
Age group (years)	
0-4	6 (9.5)
5-14	9 (14.3)
15-45	42 (66.7)
>45	6 (9.5)
Mean±SD	28±16.4
Sex	
Male	34 (54)
Female	29 (46)
Community of residence	
Jattu	25 (39.7)
Auchi	24 (38.1)
Afashio	6 (9.5)
Awain	1 (1.6)
Ayua	1 (1.6)
Idiafo	1 (1.6)
Iyuku	1 (1.6)
Ughieda	1 (1.6)
Occupation	
Student	21 (33.3)
Business	10 (15.9)
Unemployed	10 (15.9)
Civil servant	8 (12.7)
Artisans	8 (12.7)
Farmer	3 (4.8)
Nurse	3 (4.8)

n=63 *

Data analysis was carried out using IBM SPSS version 27 (IBM SPSS, Armonk, NY: IBM Corp) statistical software. Continuous variables were summarized using mean and standard deviation. Statistical significance was set at $p < 0.05$. Information obtained regarding cases was not shared with persons outside members of the epidemic response team of the Local Government.

RESULTS

One hundred and fifty (150) suspected cases of LF were identified from across the 12 wards in Etsako West Local Government Area between 1st of January and 4th of March 2019. Out of these, 63 (42%) cases were confirmed across 10 communities in the LGA. Among the confirmed cases, 34 (54%) were males and 29 (46%) were females; with a mean age of 28 ± 16.4 years. The incidence of the disease was highest among those within the ages of 15-45 (66.7%) years. Deaths also occurred more among this age group, 7 (87.5%). The communities affected included Jattu, Afashio, Ayua, Auchi, Aviele, Awain, Idiafo Agbede, Ughieda and Idegun Communities. But Jattu community was the most affected during the epidemic with 25 (39.7%) confirmed cases. This was closely

followed by Auchi 24 (38.1%) (table 1). Among the confirmed cases, 12 died from the disease, giving rise to a case fatality rate (CFR) of 19%. Most of these cases were taken to Irrua Specialist Teaching Hospital (ISTH), 51 (81.0). Only one (1.6%) patient was treated in Sacta Maria Hospital, Jattu (Table 2).

The first case of the disease was reported on the 1st of January, 2023. This was closely followed by additional 8 cases within the same week. The highest number of confirmed cases were recorded in the second week of the epidemic; with 13 confirmed cases. There were 6 additional confirmed cases on the third week (Figure 1).

As for the major symptoms/signs, purulent tonsil, 2 (3.0%) oedema of the face and neck, 2 (3.0%) and deafness 2 (3.0%) were the most common presented by the confirmed cases. Only one of the confirmed cases (2.0%) had bleeding from the orifices (Figure 2).

Fever was the most common minor symptom 52 (82.0%) presented by confirmed cases. This was closely followed by abdominal pain, 43 (68.0%). Thirty-four patients (51.0%) presented with headache. And sore throat was the least minor symptom, 3 (5.0%) presented by the patients. (Figure 3)

Table 2: Clinical Profile of confirmed cases of Lassa fever from 1st January to 4th March 2019

Profile of cases	n (%)
Presentation of major symptoms	
Nil	50 (79.4)
One	8 (12.7)
Two	4 (6.3)
Three or more	1 (1.6)
Presentation of minor symptoms	
Nil	6 (9.5)
One	10 (15.9)
Two	25 (39.7)
Three or more	22 (34.9)
Treatment Centers	
*ISTH	51 (81.0)
Favour medical Centre, Afashio	8 (12.7)
Ideal Medical Centre, Auchu	1 (1.6)
Dimma Medical Centre, Auchu	1 (1.6)
Fate Medical Centre, Auchu	1 (1.6)
Sancta Maria Hospital, Jattu	1 (1.6)
Outcome	
Alive	51 (81.0)
Dead	12(19.0)

*Irrua Specialist Teaching Hospital, Irrua

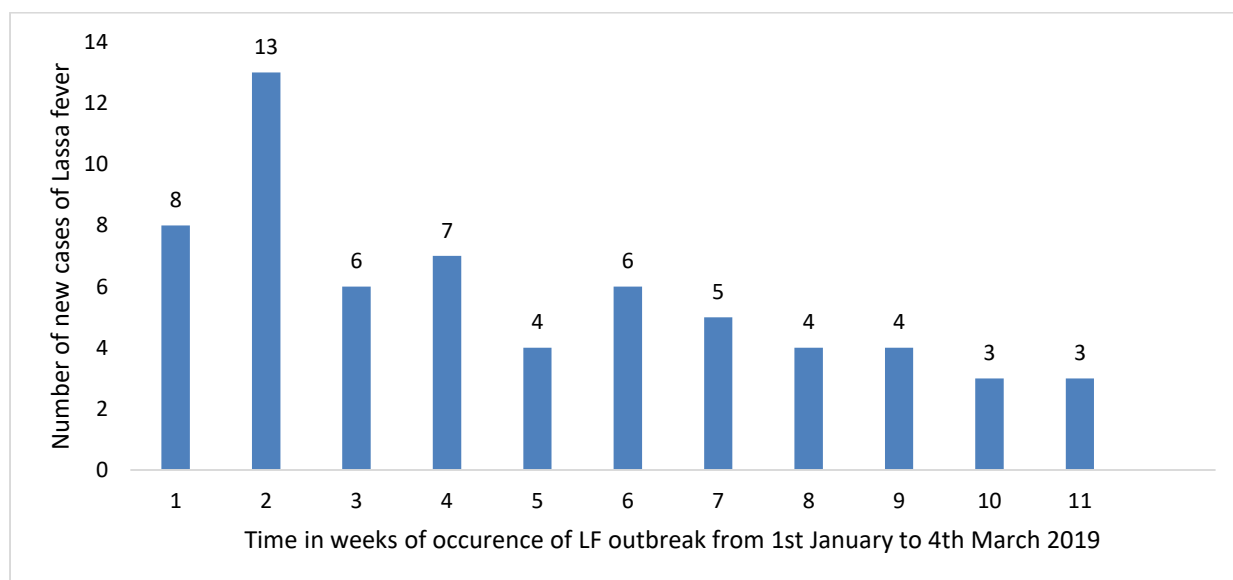


Figure 1: Time of occurrence of cases of Lassa fever between 1st of January and 4th of March, 2019

DISCUSSION

This was a review of an outbreak of LF in Etsako west Local Government Area (LGA) between January 1st and March 19th, 2019. The period of outbreak is in keeping with previous reports concerning the peak incidence of LF being during the dry season (January to march).²⁰ It also corroborates previous findings on the peak incidence especially in West Africa.²¹ About two-thirds of those with LF were within the ages of 15-45 years. This age group, being made up of the work force contains those who are most mobile and have a higher chance of contracting

infectious disease. Similar findings had been reported in Ebonyi State, Nigeria²² The case fatality rate (CFR) for this outbreak was 19%. This is indeed high and worrisome particularly because of the devastating effect on households that are affected. There is usually severe economic burden on most of these homes and the society at large.²³ The CFR is similar to the national average that was obtained in Nigeria, in January 2022.²⁴ But slightly higher than previously reported rates for hospitalized patients of 1%- 15%.¹⁴ and lower than values (22.1%) reported in Ebonyi State²² and during epidemics (50%) .^{2, 4, 25}

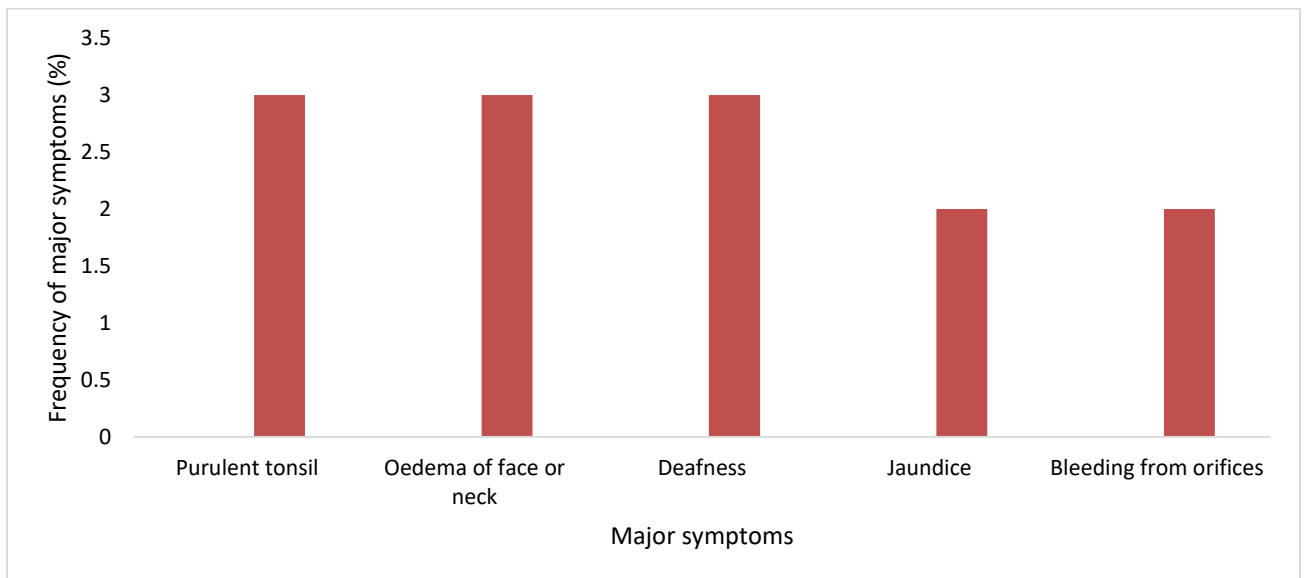


Figure 2: Major clinical symptoms/signs among confirmed cases of Lassa fever between 1st of January and 4th of March, 2019

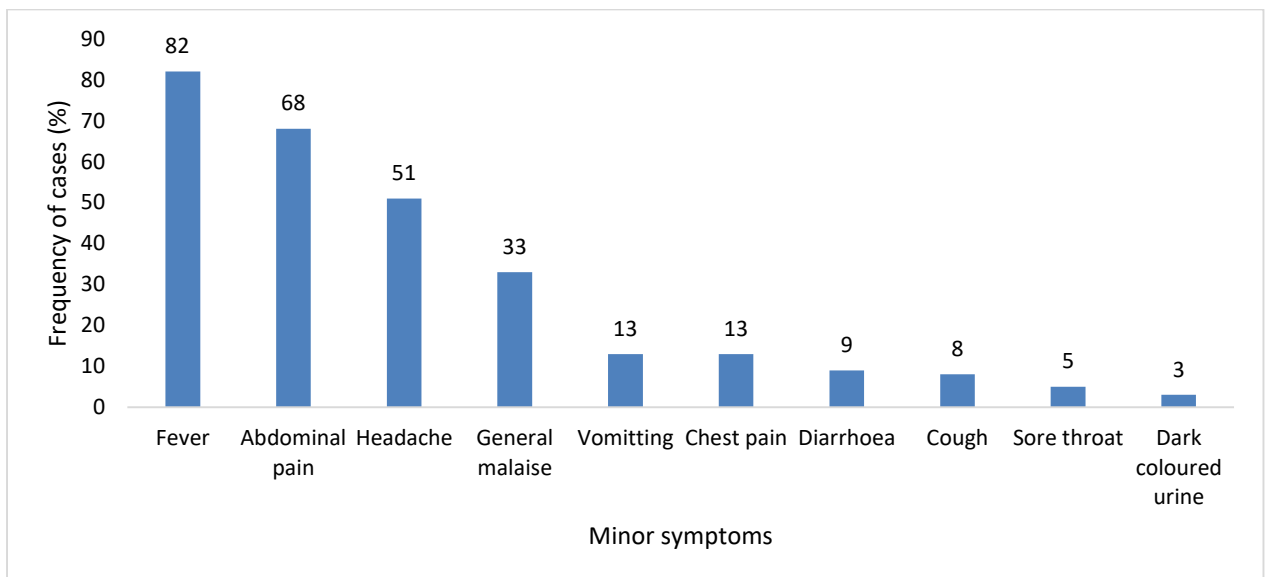


Figure 3: Minor symptoms/signs among confirmed cases of Lassa fever between 1st of January and 4th of March, 2019

The communities with the highest incidences of Lassa fever during the epidemic were Jattu and Auchu. Apart from being a predominantly student area; with most of the students from Auchu Polytechnic, Auchu,²⁶ a quick survey identified some of the peculiar characteristics of these communities. They include higher burden of the diseases and poor hygiene practices. Their environmental conditions were extremely poor and this gave room for the presence of the mastomys rodent which is responsible for transmitting the LF virus. People in these hot spot communities also had the habit of exposing their food items.¹⁹ The processing of food items made from cassava called garri was observed to be a major source of concern. They processed these food items mid-way and exposed them.

These often-provided ample opportunities for the rodents to excrete on the food items; hence aiding transmission of the disease. The possibility of spread through this mechanism has been documented in previous reports.^{19, 27, 28} All these need to be put into consideration when planning health interventions.

As regards minor symptoms of LF in this review, about four fifth of those with LF presented with fever. This finding, is not significantly different from an earlier observation about the most common symptoms of LF in Nigeria;²⁹ where 96.4% of all the cases had fever. Again, the prominence of fever as a symptom of LF is particularly important; thus, its inclusion in the definition of an “alert case” of LF. A LF “alert case” is established where any person has

unexplained fever (i.e. malaria and other likely causes of fever have been ruled out) with or without bleeding.^{12, 30} Moreover, LF accounts for 10%-15% of all cases of hospital admission for fever.¹² The presentation of fever by confirmed cases was closely followed by abdominal pain and headache. In this study about two thirds and half of the confirmed cases had symptoms of abdominal pain and headache respectively. This was slightly at variance with the result from a previous study;²⁹ where only about 40.2% and 58.7% of all cases presented with abdominal pain and headache respectively. Nonetheless, headache is particularly considered a very useful early symptom of LF. This is why it is considered as one of the symptoms that must be present to establish a “suspected case” of LF.¹² The other minor symptoms whose presence is expedient in establishing a suspected case of LF include: malaise, sore throat, cough, nausea, vomiting, diarrhoea, myalgia, central chest pain and hearing loss. Furthermore, among the confirmed cases one third had malaise; a tenth had chest pain and vomiting; less than one tenth had diarrhoea and sore throat. The presence of most of these symptoms, especially during an epidemic serves as a pointer in making a diagnosis of LF.¹²

With respect to major symptoms/signs, less than a tenth of the cases had any major symptom/sign. Some of these signs included oedema of the face or neck; deafness; purulent tonsils, Jaundice and bleeding from the orifices. This was consistent with results from a previous report by Ilori et al,²⁹ in which 2.2% had jaundice and incongruent with a report where 17.0% of the LF cases were bleeding from the orifices.²⁹ The occurrence of the major symptoms/signs in relatively fewer cases compared to the minor symptoms is based on the fact that the major symptoms are a late stage manifestation of LF during an outbreak. Whereas most of the minor symptoms occur within the first 7 days of the onset of LF, the major symptoms/signs occur after 7 days of the onset of the disease.¹²

Conclusion: Slightly less than half of the suspected cases were confirmed to have the disease. Moreover, about two-thirds of those affected were between the ages of 15-45 years and most of the cases occurred in Jattu and Auchu communities. The CFR of the outbreak was 19%. Fever was the most common minor symptom of the disease and major symptoms/signs included deafness, oedema of the face or neck and presence of purulent tonsils.

Recommendations: The State Government should step-up environmental sanitation activities in jattu and Auchu. This should be closely followed by health education on

infection prevention and control especially in the most affected communities.

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