

## Lassa Fever in A Health Care Worker-The Place of High Index of Suspicion: A Case Report

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### ABSTRACT

As a physician, you are required to keep a broad differential diagnosis when managing patients, this practice will allow for prompt diagnosis and management of diseases. The patient described in this case report is a 48 years old female. She presented with epigastric pain /reduced appetite and malaise. There was also associated history of vomiting. Preliminary evaluation was focused on possible peptic ulcers diseases, malaria and gastroenteritis (this was due to positive history epigastric pain and microscopy diagnosis of malaria, positive plasmodium falciparum) because there was seldom history of high-grade pyrexia. However, based on high index of suspicion, a queried diagnosis of Lassa fever was made and her sample was sent to the Lassa Fever reference Laboratory in Irrua Specialist Teaching Hospital, Edo state Nigeria. To our surprise, the result came out positive for Lassa Fever.

This report adds to the literature on the variance in natural history of Lassa fever symptoms presentation; and that individuals may present with uncommon symptoms like epigastric pain without necessary having high fever presentation at all times. Therefore, a high index of suspicion especially in endemic areas like ours remains the cornerstone for control and prevention of Lassa fever.

### LEPTOMENINGEAL ENHANCEMENT IN NMOSD

The diagnosis of Lassa fever is more difficult in tropical areas considering the fact that its clinical presentation is quite similar with most febrile causing illness especially malaria. This article aims to sensitize general physicians and specialist doctors on the need for a high index of suspicion in the diagnosis of Lassa fever. Therefore, this case report described and reemphasized the key role of high index of suspicion in prompt diagnosis of Lassa fever as this report will complement the effort of the clinicians in timely diagnosis and management of Lassa fever especially in endemic areas like ours.

Lassa fever (LF) is a zoonotic (animal borne) disease associated with acute and potentially fatal haemorrhagic illness, it is caused by the Lassa virus (LASV), a member of the family Arenaviridae [1-3]. It is endemic in Nigeria and other parts of West Africa including Sierra Leone, Liberia, Guinea [4]. However, neighbouring countries are also at risk, as the animal vector for Lassa virus, the “multimammate rat” (*Mastomys natalensis*) is distributed throughout the region [3]. The illness was discovered in 1969 and it was named after the Lassa town in Borno State, Nigeria where the first case was reported. Presently, on annual basis, an estimated 100,000 to

300,000 infections of Lassa fever are reported, with approximately 5,000 deaths [3].

Since the first reported cases of LF, Nigeria has experienced several outbreaks; in the week 24 of 2020, the number of new confirmed cases has increased from 64 cases in week 1, 2020 to 1031 in week 24 and these cases were reported from 27 states and 129 Local government areas of Nigeria [3-6]. Cumulatively, from week 1 to week 24, 2020, 214 deaths have been reported with a case fatality rate (CFR) of 20.8% which is lower than the CFR for the same period in 2019 (22.3%), however, worthy of note, of all confirmed cases, 72% were reported from Ondo (33%), Edo (32%) and Ebonyi (7%)

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States [6].

Lassa virus is characteristically transmitted by the urine or feces of *Mastomys* rats to humans. Health workers or patient relatives may be infected by direct contact with blood, body fluids, urine, or stool of a patient with Lassa fever [3,4]. The clinical features of Lassa fever are: Fever, malaise, generalized weakness, sore throat (very similar to strep throat and without runny nose), severe headache, chest pain (especially behind the breastbone), back pain, tinnitus, nausea, vomiting, abdominal pain and diarrhoea [3,4,7]. The clinical features of Lassa fever are quite similar with malaria and other fever causing diseases, therefore high index of suspicion remains the beacon of hope, if we must finally the control these epidemics of LF.

This article will add to the facts on the inconsistency in natural history of Lassa fever symptoms presentation; and that individuals may present with infrequent symptoms like upper abdominal pain (epigastric region) and diarrhoea without necessary having high grade fever presentation at all times. Consequently, a tall index of suspicion especially in endemic areas like Nigeria remains the bedrock for timely control and prevention of Lassa fever.

In this report, we described a middle aged female, who presented with symptoms initially thought to be due to Peptic ulcer diseases and gastroenteritis; however, upon further review based on high index of suspicion, a queried diagnosis of Lassa fever was made, this necessitated sending of sample to Lassa fever Institute, Irrua where our suspicion of Lassa fever was confirmed.

## CASE PRESENTATION

The patient was a 48 years old female health care attendant who hails and resides in Edo State, Nigeria. She was admitted with 5 days history of epigastric pain, reduced appetite and malaise. There was also associated history of vomiting, low grade fever, abdominal pain and pain on passing urine a day prior to presentation. She was a known peptic ulcer disease patient diagnosed few years ago with fair adherence to lifestyle and diet modifications. Before presentation, she visited a private hospital where she was treated with intravenous drugs without much improvement.

High grade fever was rarely present apart from few times she presented with low grade of below 38°C which was transiently relieved by anti-pyretics.

A day prior to presentation, she vomited severally; vomitus contained recently ingested feeds, water and medications. Abdominal pain was generalized, vague.

On examination, she was febrile (37.6°C), not pale, mildly dehydrated, blood pressure; 110/70 mm Hg, respiratory cycle of 20, other chest and neurological findings were unremarkable.

On abdominal examination, she had fat-laden abdomen with marked tenderness in the epigastric and right iliac fossa. An

impression of acute abdomen (acute exacerbation of peptic ulcer disease, acute appendicitis, urinary tract infection) and partially treated malaria were made. Blood samples were taken for full blood count, malarial parasite, *H. pylori*, electrolyte, urea and creatinine, as well as urinalysis, urine mcs and abdominopelvic scan. She was commenced on parenteral paracetamol, artesunate, omeprazole, promethazine and intravenous fluid. Her urinalysis showed proteinuria++, others normal, the blood investigations showed: malaria parasite +, *H. pylori* +, neutrophilia, reduced lymphocyte and mild hypokalemia (3.4 mmol) (Table 1).

On the third day of admission, there was no new complaining apart from history of weakness and mild difficulty in swollen. On examination of the throat the tonsils were enlarged and this prompted the discontinuation of the antibiotics earlier prescribed for UTI and patient was now placed on IV Augmentin 1.2 g 8 hourly.

However, on the fourth day, patient's temperature spiked for the first time with a temperature of 38.4°C. With this temperature noticed for the first time and considering the patient job description as a health care attendant, a suspicion of Lassa fever was made and sample was sent to Lassa fever reference laboratory. The aforementioned samples later came out positive and the patient was sent to the Lassa fever excellence centre for further management.

Based on diagnosis of Lassa fever, the patient was referred from our hospital to the Lassa fever specialist centre for further treatment. From the feedback information from the referral centre, patient was treated with Ribavirin and other ancillary drugs. Patients eventually got better and was discharged from their facility.

Twenty-two health care workers who were found to be high-risk contacts of the patient were screened, but none of them showed evidence of Lassa virus infection.

## DISCUSSION

Lassa fever is a zoonotic disease that commonly manifests as an acute viral haemorrhagic fever. It was first described in north-eastern Nigeria in 1969, and it is endemic in West Africa [1]. The animal reservoir of the Lassa fever virus is a rat, *Mastomys natalensis* [1,3,4]. Asymptomatic or mild febrile illness are usually reported in approximately 80% of patients, which can make diagnosis difficult. Severe symptoms such as haemorrhage, respiratory distress, repeated vomiting, facial swelling, and shock occur in approximately 20% of patients [3,8].

From 1<sup>st</sup> January to 8<sup>th</sup> December 2019, a total of 4820 suspected cases of LF were reported from 23 states, of these, 806 were confirmed positive, 19 probable and 3995 negative and this year, 2020, the LF epidemic is currently on the increase in an alarming rate and it may surpass the 2019 figures if urgent steps are not taking through research based solutions [9].

**Table 1.** Clinical laboratory parameters of the patient.

Test	Results	Normal Range
<b>Electrolyte, Urea and Creatinine</b>		
Na+	134	(135-145 mmol/L)
K+	3.4	(3.5-5.5 mmol/L)
CL	109	(96-106 mmol/L)
Bicarbonate	28	(18-28 mmol/L)
Urea	17	(15-39 mg/dl)
Creatinine	1.1	(0.5-1.4 mg/dl)
Malaria parasite	+	
H-Pylori	Positive	
Urine mcs	Yielded growth of candida	
<b>Full Blood Count</b>		
PCV	32%	(36-50)
Hemoglobin	10.3 g/dl	(12.0-16.0)
WBC	8,530/MM3	(4000-10000)
Neutrophil	75%	(55-70)
Lymphocyte	15%	(25-40)
Another parameter	Essentially normal	

At presentation, the reported case clinical features were insufficient to consider a differential diagnosis of “suspected Lassa fever” [10]. However, given that she still had malaria parasitaemia and symptoms of acute pyelonephritis, Lassa fever suspicion was given less consideration, but the persistence of generalized weakness and abdominal pain despite receiving various antimalarials and antibiotics reignited the suspicion for Lassa fever. Patient’s sample was sent to Lassa reference Laboratory, Irrua, where a diagnosis of Lassa fever was made. The patient was subsequently referred to Lassa fever expert centre where further management was instituted.

As a follow up management, contact tracing was conducted for health care, family, and community contacts. All contacts

were classified as high risk or low risk. All the contacts were actively monitored for 21 days (upper limit of incubation period) from the last possible exposure date. Contacts daily symptoms and temperature was taken twice daily at occupational health clinic of the hospital. At the end of the follow-up period none of the health care workers developed symptoms of Lassa fever. This is not surprising considering the high level of standard precautions and infection control practices being observed daily by the health care workers managing the patient.

In this study, the abdominal pain was mainly located in the epigastric region, this finding was in contrast to what was reported in another study in South-south Nigeria, where the abdominal pain was mainly localized in the right iliac fossa with tenderness and rebound tenderness [11]. However, this is not surprising as previous study has demonstrated that gastrointestinal symptoms, including vomiting and abdominal pain are fairly common in Lassa fever infection [12-14]. Again, another study done in Edo state, Nigeria, reveals abdominal pain as the 4<sup>th</sup> most common presenting symptom of LF [11], occurring in about 36% of patients, though a higher rate has been described in another study [14].

This study brings to the fore that low grade fever without necessarily having temperature spikes at all times may be serious pointer to Lassa fever especially in endemic areas like ours where Lassa fever is highly prevalent. This information is important considering the fact that the Nigeria center for diseases control has benchmarked a mark high temperature as indication for suspicion of diagnosis of Lassa [15].

In this patient, low grade fever/no fever (even the fever was only reported in the evening by the patients) was recorded most of the time, however a temperature spike was recorded only once on admission. This fever pattern was typical of malaria and this could have been explained by the presence of one plus of malaria parasite and *H. pylori*. Again, if there is no high index of suspicion, such fever pattern would have swayed the mind of the clinician to considering only malaria since Lassa fever pyrexia is not intermittent.

The aforementioned emphasizes the importance of high index of suspicion Lassa fever when managing patient with fever as low-grade fever and presence of other fever causing condition does not rule out possibility of Lassa fever. Therefore, it is imperative for all physicians to have a high index of suspicion when they are managing pyrexia of known origin, because Lassa fever can co-exist with other pyrexia causing conditions. This further cements the facts that high index of suspicion is key to early diagnosis and management of Lassa fever.

This study has advanced the emphasis of the importance of early case presentation, high index of suspicion, contact tracing and prompt diagnosis by the clinicians in the management of LF. This report has once again highlighted the fact that supportive management of symptoms of the LF and

its complications may improve prognosis for individuals with the infection.

LF can be controlled by keeping rodents away from homes, implementation of isolation measures, using Personal Protective Equipment, contact tracing, and the health enlightenment of people in high endemic areas on ways of ensuring their houses are rodent proof [1,16-18]. Furthermore, Prevention and control of Lassa fever depends on promotion good “neighbourhood hygiene” to discourage rodents from entering homes. Other helpful control measures include storing of foods and other household edibles in rodent-proof containers, proper management of home waste, maintaining clean households and keeping cats. This is highly necessary considering the fact that *Mastomys* are so abundant in endemic areas, therefore, it is not possible to completely eliminate them from the environment [19].

Future research needs to be conducted in communities to identify variance of other symptoms associated with Lassa fever; this is extremely importance in communities and countries with yearly occurrence of epidemic of Lassa fever. Furthermore, such study should be followed with more cohort studies to determine various clinical presentation of Lassa fever.

## CONCLUSION

This report adds to the facts on the variance in natural history of Lassa fever symptoms presentation: The clinical features of Lassa fever are quite similar with malaria and other fever causing diseases, therefore high index of suspicion remains the beacon of hope if we must finally put an end to the scourge of Lassa fever. Therefore, there is need for the clinicians to be trained regularly on the current concept of timely symptoms identification and management of LF. This report further emphasized the significance of early presentation, high index of suspicion among health care personnel with the aim to reduce LF complications and deaths.

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## CONFLICT OF INTERESTS

The authors have no conflict of interest to declare.

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