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A Case Report of Lassa Fever between Boundary Communities in Nigeria and Republic of Benin: A Call for International Collaboration

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ABSTRACT

The spread of Lassa Fever (LF) cases across international borders call for cross-board management and collaboration. This case report describes a laboratory-confirmed index case of LF in Kwara state, Nigeria. The case of LF in Kwara state was a 30-year-old woman who presented with a history of fever, headache, and abdominal pain and had been treated for malaria. On 13th February 2020, the Kwara State Ministry of Health was notified of a suspected case of LF. The case visited health facilities in Kwara state, Nigeria, and the Republic of Benin during her illness. Blood samples were obtained from her, and she was confirmed a positive LF case in the Republic of Benin. Although LF diagnosis is challenging, multisectoral collaboration and effective community engagement within the framework of the International Health Regulations is required to control the LF outbreak promptly.

Introduction

Lassa Fever (LF) is a zoonotic, acute viral hemorrhagic illness caused by Lassa virus, a member of the arenavirus family [1, 2]. Lassa virus is a single-stranded RNA virus, and its reservoir is a multi-mammate rat, Mastomys natalensis [3]. Globally, it has been estimated that 300,000-500,000 cases of LF present annually, with 5,000 deaths [4]. LF is endemic in West Africa, with annual outbreaks recorded in Liberia, Sierra Leone, Guinea, the Republic of Benin, and Nigeria [4]. After 51 years, Nigeria battles with outbreaks of LF occurring at different periods in the year [5].

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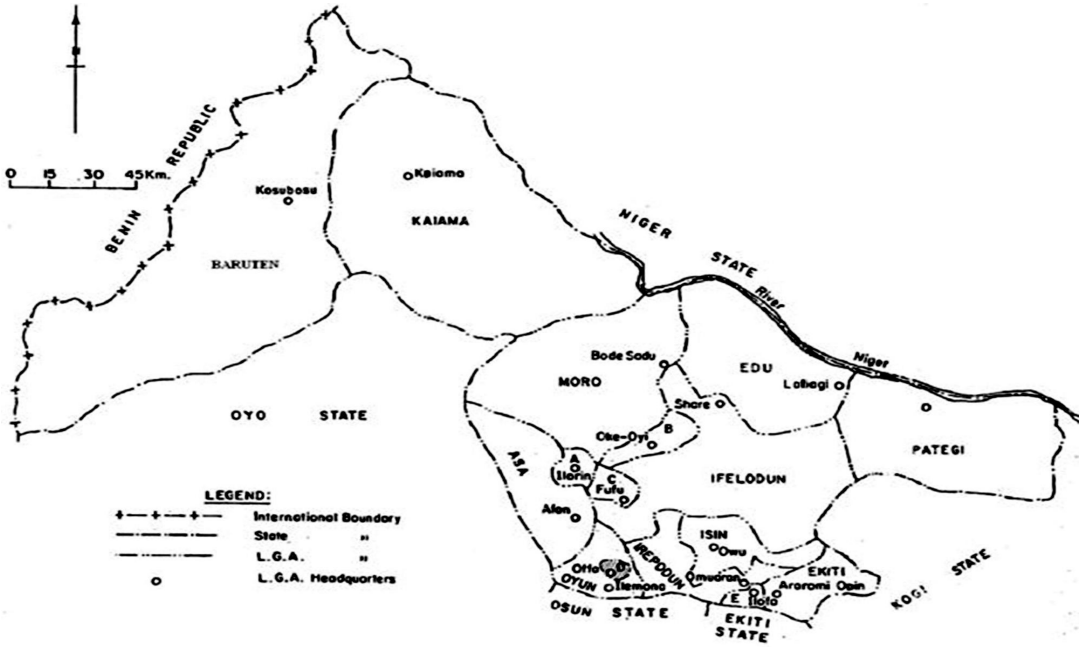

Figure 1. The Bwen-Benin Republic boundary in Kwara state, Nigeria

Generally, 80% of LF cases are asymptomatic, while 20% of LF cases are associated with severe multi-systemic disease [6]. Primary transmission of LF occurs via rodent-to-human routes [6, 7]. Preliminary information on LF could include the ingestion of food or materials contaminated by infected rodent excreta or urine, catching and preparing multimammate rats as a food source, and inhalation of aerosolized virus. Secondary transmission of LF occurs via human-to-human routes when direct contact is made with infected blood, tissues, secretions, or excretions of infected humans; and needle sticks or other sharp injuries [6, 7].

LF initially presents with fever, general weakness, and malaise, after which headache, sore throat, muscle pain, chest pain, nausea, vomiting, diarrhea, cough, and abdominal pain may occur [8, 9].

Severe LF may result in facial swelling, fluid in the lung cavity, bleeding from the mouth, nose, vagina, or gastrointestinal tract, and low blood pressure. LF severity worsens during pregnancy, with maternal death and/or fetal loss occurring in more than 80% of cases during the third trimester [4]. Unfortunately, many instances of LF go undetected at the early stage due to the similarity of its presentations with other illnesses such as malaria [9].

No LF vaccine is available right now; however, parenteral ribavirin is the medication of choice for LF treatment, mainly when commenced early [9, 10]. Primary prevention of LF through the maintenance of standard infection prevention and control measures in community settings is key to preventing an outbreak of LF [10]. The spread of LF across states, including states that share borders with other countries, suggests a risk for inter-border transmission and threatens global health security [11]. This calls for cross-board collaboration in managing the LF epidemic and the need for information sharing between countries to minimize the risk of international spread.

A high suspicion among healthcare workers of febrile patients in LF-endemic areas such as Nigeria is needed urgently to break the LF transmission chain. Therefore, this case report describes a laboratory-confirmed case of LF in Kwara state, Nigeria. The cross-border context explicitly provided credible information on the effectiveness of international and multisectoral collaboration between two West African countries. The framework of the International Health Regulations enabled the success of the LF outbreak response activity.

Case presentation of Lassa Fever in Baruten LGA

On 13th February 2020, the Kwara State Ministry of Health was notified of a suspected case of LF. The case (Mrs. A) came from Bwen, Baruten Local Government Area of Kwara State. Baruten LGA is located in the North-central district of Kwara state and shares an extended border with the Republic of Benin [12] (Figure 1).

Mrs. A was a 30-year-old woman who lived in a farm settlement in Bwen area. She was a renowned trader of alcoholic drinks. At the initial presentation, she presented with a history of fever (39.20C), headache, and

abdominal pain at a Primary Health Centre (Hospital A). She was treated for malaria with Artemisinin-based Combination Therapy (ACT) and analgesics and Intravenous Fluid (IVF) on the 13th February 2020. She visited a patent medicine vendor (PMV) in Bwen the next day, where intramuscular diclofenac and artemether were administered. She was also observed for some period at the patent vendor's store.

On 16th February 2020, Mrs. A presented at a private hospital (Hospital B) with a history of fever, headache, abdominal pain, and bleeding per vaginam. There, IVF and analgesics were administered. At this instant, Mrs. A was suspected of LF. She was immediately referred to "Hospital C," a government-owned hospital in the Republic of Benin, where biological samples were obtained from her, and she was placed in isolation. Mrs. A died on 17th February 2020 in the Isolation center in Hospital C. The result came out positive for LF after her death.

The Republic of Benin immediately commenced a case investigation on 20th February 2020, and identified three contacts. The contacts were immediately enrolled in care at Hospital C, where they recuperated. Also, 39 references were monitored for 21 days by the Kwara State Ministry of Health, none of whom developed symptoms.

Response Activities in Baruten LGA

A list of Mrs. A's contacts was made, all were placed on surveillance. Thirty-nine contacts, mainly from the farm settlement where Mrs. A worked, were screened for fever. However, none was febrile as of the time of the investigation. In addition, fumigation of Hospital A, the PMV store, the house of the case, and Hospital B was done. In addition, sensitization campaigns were organized for schools and residents of the farm settlement on the signs, symptoms, and preventive measures for LF. At the same time, sensitization campaigns were conducted among port health officers and related professionals to improve their index of suspicion for LF.

Screening of immigrants for fever

Screening for fever was conducted for all immigrants at the Benin-Nigeria border, and hand sanitizers were provided to all immigrants. The confirmed blood sample of an immigrant whose fever (temperature of 39°C) was taken. A Rapid Diagnostic Test was conducted on the immigrant, and he was immediately placed on ACT.

Other activities

Debriefing was done at the LGA level. During this period, donations in cash and in-kind were received, including personal protective equipment, such as gloves, face masks, and safety boots. In addition, hand sanitizers, information, education, and communication materials were also provided and prepositioned at the LGA Secretariat. The State government's high sense of responsibility and responsiveness enabled a timely outbreak response.

Discussion

We reported the outbreak of LF in Kwara state, along the Nigeria-Benin border. The case report identified the strategies for a rapid response to the LF outbreak in a cross-country context. The diagnosis of LF is challenging based on the development of signs and symptoms only. Unfortunately, in many instances, LF goes undetected until the disease has progressed to severe conditions such as severe hemorrhage, loss of pregnancy, and development of comorbidity [6]. To enable timely detection, contacts of the case were identified early enough. Evidence from literature has reported the effectiveness of timely detection of references in breaking the chain of infectious diseases [13]. Although Kwara state is not an LF-endemic area, the occurrence of LF is not bound to any particular geographical location. Since Nigeria is an LF-endemic country, adequate preparedness should be ensured all year round due to earlier reports of seasonal outbreaks of LF in the country.

The spread of LF across countries suggests the risk of inter-border transmission of LF, thus posing a significant threat to global health. A recognition of this fact prompted the inter-country response strategy and multisectoral collaboration to manage LF when an case of LF was identified in Kwara state, Nigeria. As a result, mounting continued surveillance for LF became pertinent, and the active engagement of healthcare workers became highly required. A tree cannot make a forest, so goes an African proverb; thus, the efforts of healthcare workers cannot be solely sufficient to address the LF disease. Therefore, the importance of community participation in identifying contacts of LF, enrolment in testing, and adoption of basic infection control measures cannot be overemphasized [14].

Consequently, multisectoral involvement provides an avenue for which the infection and transmission of LF could be addressed via multiple fonts. For instance, regular hand washing and community hygiene promotion include storing foods in rodent-proof containers, disposal of garbage far from residential areas, and main-

taining household cleanliness need to be immediately undertaken [15]. Therefore, multisectoral involvement should be stepped up in the LF control strategy in Nigeria and other West African countries.

Conclusion

The LF outbreak poses a significant threat to public health. Its transmission across international borders accentuates the need for mounted vigilance, surveillance, a higher index of suspicion, and multisectoral collaboration. For this cause, we recommend that LF awareness programs be organized regularly to intimate community members with the knowledge of LF preventive measures and identify suspected cases of LF for prompt notification of health personnel. The enhancement of the capacity of the rapid response team in each state for immediate management of LF outbreaks is essential. Likewise, regular training should be organized for all healthcare workers and surveillance focal persons for early case detection and notification. Financial support is in dire need to submerge the LF outbreak. Therefore, private organizations and policymakers should be more responsive towards providing more funds needed for a swift response during events of the LF outbreak in Nigeria.

Ethical Considerations

Compliance with ethical guidelines

There were no ethical considerations to be considered in this research.

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Conflict of interest

The authors declared no conflict of interest.

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