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Lessons learned from Managing Lassa Fever Cases at the Infectious Disease Control Centre, Kaduna State, North Central Nigeria

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Abstract:
Background: less focus is often placed on associated problems with infectious diseases in the third world nation leaving outbreaks of such in dire need of preventive care. The study is aimed at exploring the common factors associated with patients with infectious diseases, viral heamorrhagic fever, especially Lassa fever (LF) at the infectious disease control centre in Kakuri Kaduna state, North Central Nigeria. Methodology:The report of five cases of (Lassa fever) LF treated at Infectious Disease Control Centre (IDCC) Kakuri Kaduna; three cases presented first at General Hospitals namely: General Hospital Sabon Tasha, Idon General Hospital, and Dr. Gwamnan Awan General Hospital (DrGAGH), one presented in Ahmadu Bello University Teaching Hospital (ABUTH) and one presented to FMC Abakaliki. The three cases from the general Hospitals which were initially referred to Barau Dikko Teaching Hospital (BDTH) were later transferred to the IDDC Kakuri, while the case from ABUTH was referred directly to the IDCC. The fifth case was initially diagnosed at FMC Abakaliki but absconded and was later presented to the IDDC Kakuri. These cases were treated at the IDCC Kakuri, Kaduna State, Nigeria between January and March, 2020. Results: One of the five cases died as a result of late reporting to the hospital, the other four survived and discharged from the IDDC Kakuri. Two of the survivors were faced with stigmatization. Two left the isolation centre, one re-presented himself while the other was traced and returned for care at the IDDC. Conclusion: Absconsion from isolation facility, late report of suspected Lassa fever (LF) to appropriate quarters and inadequate laboratory facilities for identifying and confirming the disease; and stigmatization were identified to be major challenge faced in the management of LF. The state RRT were found to be effective in improving the survival of the LF sufferers with Rivabirin and the available PCR diagnostic kits usually sent by pouch to national diagnostic referral centers.
Key Word*: Late report; Absconsion; Stigmatization; Lack of laboratory facilities; Health education; Rapid response Team.*

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I. Introduction

Infectious diseases have had a significant role in shaping human history, and are responsible for, through the great plagues of the past, more deaths than any other human pathology; these outbreaks have engraved an automatic response in our subconscious of a fear of infection. In an era of major scientific progress

in battling, and even eliminating, certain infections, this fear may seem unwarranted. Yet 'germ panic' consistently re-emerges, in contrast to the fear related to more burdensome entities, in terms of mortality, such as cardiovascular disease [1]. Paul Ricard, (2020) [2] highlighted reasons why infectious diseases cause the most significant psychological unrest, both in the public and in health professionals alike, describing infection as being transmissible, imminent and invisible also that, the field of infectious diseases is ever-expanding, especially with the current COVID – 19 pandemic that is yet to get a cure and or Vaccine. Infection is often considered as a social issue that indirectly leads to stigmatization, as in the case of brucellosis, where patients may express denial, because of a correlation of the infection with a lower socio-economic status [3].

Stigma has been defined as a mark of shame or an attribute that is deeply discrediting within a particular social interaction. Stigma and discrimination against infected individuals pose significant barriers, negatively affecting access to care and treatment [4]. The presence of disease-causing stigma arguably predates the Pre-Modem era [5].Patients and exposed persons to infectious diseases have anxiety that extends beyond the physical consequences of infection, to social consequences such as stigmatization. Stigmatization during an acute outbreak Hantavirus was also racially orientated [6]. In the study done in Hong Kong, Media miscommunications and inconsistent health policies was highlighted as factors amplifying stigmatization [7].

The fear of disease and of different people both can lead to social stigmatization Goffman E. cited in Des [8]. In certain instance these fears co-occur, resulting in severe stigmatization of strangers with diseases. Stigmatization have associated the adverse consequences of a disease process in multiple ways, ranging from increasing the suffering of persons with the disease; a cohort at risk for the disease not seeking care, making it much harder for public health authorities to contain; health professionals and volunteers face grueling tasks locating index cases resulting in the further spread of the disease and considerable economic losses [8,9,1,10,11]. According to S.F. Usifoh *et al.,* (2019) few studies have attempted to address the perceived psychosocial component of LF disease in Nigeria [12].

The endemicity of Lassa fever in tropics amidst the current COVID – 19 pandemic is more devastating. Nigeria and the entire west coast of Africa needs more research, advocacy and welfare support in order to curb the narrative [13]. All age groups are at risk of being infected Lassa fever viral disease irrespective of gender [14]. Other perinatal outcomes reported in the literature include prematurity and vertical transmission [15]. The population growth with her attendant infrastructural and environmental deficit in Nigeria has ravaged communities over 50 years. Twenty one outbreaks had been documented in Nigeria involving 5442 suspected cases, Lassa fever was confirmed in 768 examined individuals, out of which 631 deaths were recorded [16]. Although, Lassa fever (LF) is endemic to Nigeria, the health system is yet to overcome its surveillance and immediate notification leaving substantial over 25% case fatality [17].

The study is aimed at exploring the common factors associated in patients with infectious diseases, viral heamorrhagic fever, especially Lassa fever (LF) at the infectious disease control centre in Kakuri Kaduna state, North Central Nigeria.

Compliance with Ethical Standards

Ethical Approval

Ethical approval NHREC/17/03/2018; MOH/ADM/744/VOL.1/926 was obtained from the Kaduna State Ministry of Health, Nigeria.

Statement of Informed Consent

Informed consent was obtained from all individual participants included in the study.

Disclosure of Conflict of Interest

Authors hereby declare no conflict of interest.

II. Case Reports

The report is for five cases of LF treated at Infectious Disease Control Centre (IDCC) Kakuri Kaduna; three cases presented first at General Hospitals namely: General Hospital Sabon Tasha, Idon General Hospital, and Dr. GwamnanAwan General Hospital (DrGAGH), one presented in Ahmadu Bello University Teaching Hospital (ABUTH) and one presented to FMC Abakaliki. The three cases from the general Hospitals which were initially referred to Barau Dikko Teaching Hospital (BDTH) were later transferred to the IDDC Kakuri, while the case from ABUTH was referred directly to the IDCC. The fifth case was initially diagnosed at FMC Abakaliki but absconded and was later presented to the IDDC Kakuri. These cases were treated at the IDCC Kakuri, Kaduna State, Nigeria between January and March, 2020.The details of the cases are presented below:

Case One- Case of late report

On January 22, 2020, a 36 year-old, male cook in a restaurant, from Angwan Yelwa Television station premises of Chikun Local Government Area presented to the BDTH, Kaduna, having been referred from the Sabo General Hospital on account of a febrile illness which did not respond to treatment since 17th January

2020. He presented at BDTH with high-grade fever and abdominal pain of 8 days duration, 3 days history of vomiting with streaks of blood in vomitus, difficulty breathing, worsening level of consciousness, and restlessness. There was no history of travel to areas with high burden of Lassa fever within the previous two months to symptom onset. Patient initially resorted to self-medication and had to be compelled to present to the hospital by family members when his health condition worsened 8 days after the onset of symptoms. He was initially managed for malaria and typhoid empirically. However, laboratory results were not suggestive of the provisional diagnosis. The patient's condition worsened and was referred to the BDTH on the 22ndJanuary, 2020. After checking his vital signs, and review of the referral history a diagnosis of fulminant hepatitis to rule out viral hemorrhagic fever was made. His clinical signs and symptoms continued to deteriorate with falling levels of consciousness, increased restlessness, worsened breathing, and unremitting high grade fever. Laboratory test results showed no malaria parasite while FBC + Differentials, U&E, Cr, LFT (deranged). The hospital admitted the patient in an isolation room and sent a blood specimen to the National Reference Laboratory Gaduwa, Abuja on the 22ndJanuary, 2020. The results were confirmed and referred immediately to the Kaduna State Infectious Disease Control Center (IDCC) and in 6/15 Glascow scale coma. The unconscious patient was placed on IV Ribavirin, IV dextrose saline alternating with Ringer's Lactate, Push IV 10% Dextrose. The Nigerian Center for Disease Control (NCDC) and Irrua Specialist Teaching Hospital (ISTH), recommended dialysis for the patient not readily accessible to the centre and within another 6 hours, succumb to the disease

Case Two – Case of fairly early report

A 32 year old, male Nurse (Idon General Hospital) presented to the Idon General on the 23rdJanuary, 2020 with a 4 day history of fever, epigastric pain, vomiting, headache and bloody stools. Patient was commenced on broad spectrum antibiotics and antimalarial medications. He was then referred to the BDTH on the 27thJanuary, 2020 on suspicion of viral hemorrhagic fever. Blood Sample was taken on the 28thJanuary, 2020 and returned positive on the 30th January, 2020. There was no history of contact with a confirmed case of viral hemorrhagic fever patient who is a hunter in his neighbourhood, though the surveillance team found his abode to be rodent infested and control measures instituted.Patient was then moved to the IDCC on the 31stJanuary, 2020. On examination patient was not ill-looking, afebrile (37.2^{0}C), not pale, anicteric, acyanosed, BP 130/79 mmHg, PR 96bpm. He complained about epigastric pains. He was commenced on Ribavirin and Magnesium Trisilicate. Furthermore, patient developed mild cough on the 2ndFebruary, 2020 and was further placed on Tabs Amoxiclav and SuspAscorex. He responded to treatment, got better and was discharged on the 15thFebruary, 2020 on return of a negative Lassa fever PCR.

Case Three – Case of acclaimed and fear of stigmatization, absconsion and refusal to isolation and treatment

A 37 year old female grilled fish seller who presented to the Dr. Gwamnan Awan General Hospital (Dr GAGH), Kakuri on the 30th January, 2020 on account of fever, sore throat and vomiting with a streak of blood. Patient is a known hypertensive. An initial diagnosis of malaria/typhoid to rule out viral hemorrhagic fever was made. Patient was administered with only first dose oral ribavirin and was lost to follow up due to lack of legislation during isolation.–On the 1stFebruary, 2020, results returned positive for Lassa fever and the Dr GAGH was informed to prepare patient for transfer the next day. In the morning of 2ndFebruary, 2020, it was discovered that the patient had been earlier referred to BDTH. A vehicle was sent to pick the patient from BDTH while. The RRT was alerted to locate the index case for isolation and management that proved a hilarious task until relevant security personnel assisted in returning to the isolation centre. On examination, the young woman was clinically stable and expressed the stigma of being a LF sufferer by the steps taken by the RRT

On the 3rdFebruary, 2020 repeat sample for PCR was taken, while Repeat PCR (tie-breaker) returned positive (5th February, 2020).On the 9thFebruary, 2020, patient complained of dizziness and anxiety at night and was counseled on diet and the possible adverse events using Ribavirin. A repeat PCR was taken on 11th February 2020 and result received after over 72 hours and the results turned out negative PCR test for LF. The patient was then discharged home on the 18 February 2020 on a clean bill of health after 18 days of uncertainties and isolation.

Case Four - Case of Acclaimed hospital discharge, absconsion and re-presentation

This was a case of a 40 year old male and a staff of Nigerian Drug Law Enforcement Agency (NDLEA), who allegedly absconded from isolation at the Federal Medical Center Abakaliki – Ebonyi state, South-Eastern Nigeria. Patient claimed that he was discharged before the release of Laboratory results. Patient presented at the IDCC Kakuri Kaduna on the 19thFebruary, 2020. He complained about cough, retrosternal pain, loose watery stools, headache, nuchal swelling and general body weakness all of 2-3 weeks duration prior to admission.

On examination patient was initially calm, alert, acutely ill-looking, anicteric, acyanosed, not pale, coughing and actively spitting. Approximately 2 hours post admission; patient complained of chills and rigors and was febrile (38.4C), continued coughing and in moderate respiratory distress. He was however placed on Ribavirin, IV Ringer's lactate, dextrose saline and paracetamol.

Two days into admission (20th February, 2020), the patient's condition deteriorated with clinical features of LF mandating further clinical management under barrier and the diagnostic PCR feedback returned positive, on day 9 and 13respectively. By the end of day 16 the RT-PCR returned negative and clinically the patient was discharged home as required.

Case Five – Case of prompt report and stigmatization

A 41 year old male, Librarian with the Ahmadu Bello University (ABU), Zaria, having been admitted at the Ahmadu Bello University Teaching Hospital (ABUTH) and isolated on the 14th February, 2020 with a 6 day history of high grade fever, 3 days history of cough, recent travel, and no history of contact with a similarly ill person and later established with rodent infested abode was confirmed as a case of Lassa fever on the 22nd February, 2020, referred and admitted same day at the IDCC. Patient was placed on Ribavirin (not regular) 3 days (19/07/2020) on to admission to IDCC. On examination young man, afebrile, acyanosed, anicteric, mildly dehydrated.

Patient was placed on Ribavirin, Dextrose Saline, Ceftriaxone, Paracetamol, Flagyl. Patient complained about stigmatization of his family by neighbors and the Health Education team was notified and deployed.

He also complained about scrotal (right) tenderness, nuchal tenderness (query sleeping position) on day 3 (24th February, 2020) of admission. On examination: right testis was moderately tender, with fluid at the base. An impression of right orchitis to rule out a hidden hernia (right) was made. For this diagnosis Patient did well on broad spectrum antibiotics (Ceftriaxone and Metronidazole). A repeat RT-PCR sample collected on the 28thFebruary, 2020 returned positive, the day 8 since initial diagnosis followed by a second PCR test on day 8 and by a third one on day day 9 returned negative. A clinical assessment by the clinicians gave a clean bill to recuperate at home.

III. Contact Tracing Protocol and Health Education

The Kaduna State RRT conducted contact tracing on the five identified cases received by the Isolation centre as required in the national guideline for LF epidemiologic surveillance. Ejembi *et al.,* (2019) reported that contact tracing an important strategy employed in surveillance to aid prompt detection of infectious disease and control outbreaks and that It involves the identification of those who have come in contact with an infectious person and following them up for the duration of the incubation period of the disease to promptly detect symptoms and signs and institute treatment thus reducing chances of disease spread to other susceptible individuals [18].

All five patients were followed up 21 days after the period of their illness, reported negative for LF. Tukur *et al*., (2020) observed that very close contact are at more risk to getting infected from LF patients [13].

The Health Education team was prompt in handling sensitization exercise on Lassa fever and campaign against stigmatization alongside the contact tracing team.

IV. Discussion

Reduction of the impact of LF disease outbreak through the established Rapid Response Team (RRT) is a technical and multi-disciplinary to efficiently mobilize and deploy as required [19]. The challenge inherent many developing nations has been insecurity, access to at-risk persons and communities scaling up contextually diagnostic and care access at the point of need no matter the location and time without any encumbrances is critical to improving vulnerable population quality of life, productivity, reduction financial impoverishment and poverty alleviation [20, 21].

Though knowledge on Lassa fever in Nigeria is high among medical practitioners, low access to affordable and simple tests for timely distinguishing and confirming the disease in the region is observed [22]. These further prolong the time between suspecting a case and confirming it for Lassa fever and its attendant consequences on the disease outbreak and control efforts [23]. The RRT established may largely account for the improved clinical outcomes of 4 of the five patients admitted to the centre. Stigmatization was seen to contribute to the delayed reporting and hospitalization, and this calls for a review of the current health education messages to target on persons rather than the control of rodents alone as priority [24, 25, 26].

Contact tracing health education was quite a good measure of prevention of spread LF as all in contact with the cases, including the heath personnel stand high risk of contracting the disease. The unusual case of assault on an health personnel by the female case and health education exercises as found in our study is in concordance with Denue *et al*., (2017) who reported that "Health-care workers need to be adequately trained on diagnostics, active case management in designated isolation centers, contact tracing and active surveillance, infection prevention and control measures while managing cases and handling infectious wastes, laboratory

specimens, safe burial practices of patients that had died from Lassa fever and health education on control of the rodent that harbour the lassa virus" [27].

Further still, Idigbe *et al*., 2020 reported the need for continuous education and engaging the community to create care, treatment and support programs to reduce the stigma associated with Lassa fever as well as provide psychosocial counseling to survivors, their significant others, treatment partners and relatives [26].

Issues of patient escapades from isolation centers as reported cases 3 and 4 of our study are not new to the Nigerian society. It may be recalled that on Monday, January 27th, the Osun State Government had confirmed two cases of Lassa fever, but one of the suspected patients had absconded while undergoing observation [28]. There was panic in Osun State on Monday when one of the patients undergoing treatment for Lassa fever absconded from the Obafemi Awolowo University Teaching Hospital in Ile-Ife. Reports say the patient escaped from where she was being treated along with another patient with a similar case [29].

All 5 cases were managed with ribavirin as it is the accepted drug for the treatment of LF. There are concerns about its use as regards its toxicity. For instance, Eberhardt *et al*, (2019) reported that, "Based on the available data, current treatment guidelines may therefore put patients with mild LF at increased risk of death; the role of ribavirin in the treatment of LF requires urgent reassessment" [30]. Despite concerns regarding toxicity and lack of specificity, ribavirin (1-b-d-ribofuranosyl-1,2,4-triazole-3-carboxamide), a guanosine analogue that is active against a broad spectrum of DNA and RNA viruses has become an accepted off-label treatment for LF and is the recommended standard treatment for LF patients in national and international guidelines [31, 32, 33].

V. Conclusion

Absconsion from isolation facility, late report of suspected Lassa fever (LF) to appropriate quarters and inadequate laboratory facilities for identifying and confirming the disease; and stigmatization were identified to be major challenge faced in the management of LF. The state RRT were found to be effective in improving the survival of the LF sufferers with Rivabirin and the available PCR diagnostic kits usually sent by pouch to national diagnostic referral centres.

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