KNOWLEDGE AND PREVENTION PRACTICES OF LASSA FEVER AMONG HEALTH PROFESSIONALS IN BADAGRY LOCAL GOVERNMENT AREA OF LAGOS STATE

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Abstract
The purpose of this study was to examine the knowledge, and prevention practices of Lassa fever among health professionals in Badagry local Government Area of Lagos. The population of the study consisted of all health professionals in Badagry local Government Area of Lagos. The sample for this study consisted of 100 participants selected from the population. The Simple random sampling technique was used to select the sample. Data was collected with the use of self- developed "Lassa Fever Knowledge and Prevention Practices Questionnaire (LFKPQ). The instrument was used to collect information on the variables selected for the study. The questionnaire was a close ended type designed in line with the modified Likert 4- point Scale of Strongly Agree, (SA), Agree-(A), Disagree-(D) and Strongly Disagree, (SD). To test the validity of the instrument, a copy of the questionnaire was given to researcher's supervisor for critical review, errors were corrected, and it was validated. The reliability of the instrument was conducted using the test-retest method. A total of 10 respondents from Igando Primary Health care who were not part of the sample were used as pilot to test the reliability of the instrument. Data collected was subjected to Pearson Product Moment Correlation Coefficient (PPMCC) which yielded 0.87 coefficient which indicates that the instrument was reliable. Findings from the study revealed that health professionals in Badagry Local Government Area had knowledge of Lassa fever, practice the basic hand hygiene of Lassa fever prevention, practice respiratory hygiene of Lassa fever prevention but not use personal protective equipment to prevent Lassa fever regularly.

Key words: *Health professional, Lassa fever, Knowledge, Hand washing, Respiratory hygiene, Personal protective equipment.*

Introduction

Lassa fever is an acute viral hemorrhagic fever caused by Lassa virus (LASV), a member of the virus family Arenaviridae" and transmitted by the multimammate rat Mastomys natalensis (M. natalensis). Mastomys natalensis is commonly found in Sub-Sahara Africa, where up to 30% can be carriers of the LASV in endemic regions (Kelly et al., 2000). The disease was named after the town where it first occurred in Lassa, Borno State (Centre for Disease Prevention & Control, (CDC) 2014). Lassa fever is a zoonotic disease transmitted from animal-to-human and this arises from contaminations with the excreta, urine, and other secretions of the rats (Lo Iacono, et al., 2015). The host of the LASV, the multimammate rat, once infected could excrete the virus from its urine for a prolonged period and at times for the rest of their lives (Lo Iacono et al., 2015; CDC, 2014). The primary route of transmission of Lassa fever is through contact with infected rodents feaces, urine, or blood,

while secondary route of transmission includes direct contact with the body fluid of an infected person. The consumption of infected rodents is another possible means of transmission (Dan-Nwafor, et al., 2019).

In addition, these rats can produce a large number of offspring frequently. They are predominant forest dwellers but can also colonize human homes especially areas where food is stored. Humans contract the virus mainly through contact with infected excreta of Mastomys natalensis rodents (commonly known as Multimammate rats), which is a natural reservoir for the virus and are ubiquitous in the country (World Health Organization, (WHO) 2020). Infected rodents are reservoirs capable of excreting the virus through urine, saliva, excreta, and other body fluids to humans. Secondary transmission of the virus between humans occurs through direct contact with infected blood or body secretions. It happens mainly in doctors caring for patients, although anyone who comes into close contact with a person who carries the virus is at risk of infection (Richmond, & Baglole, 2003).

The first confirmed cases of the disease were reported in Nigeria in 1969. The 2017/2018 Lassa fever outbreak in Nigeria was unprecedented; heralded by an initial report of a cluster of cases and deaths among healthcare workers in a tertiary health facility by week 2 of 2018 (Dan-Nwafor et al., 2019). At the end of 2018, 23 states within the country were affected by the Lassa fever outbreak. A total number of 3498 suspected cases were identified, of which 633 cases were confirmed with a case fatality ratio of 27% (171 deaths) (NCDC, 2019). Healthcare workers accounted for 7% and 5.8% of confirmed cases and deaths attributed to Lassa fever outbreak respectively, depicting substantial risk to healthcare workers. (Dan-Nwafor et al., 2019; NCDC, 2019). This has contributed to approximately 19% of all reported cases (Lo Iacono et al., 2015). Other frequently reported routes are human-to-human transmission (secondary transmission) occurring through direct contact with infected blood or bodily secretions (Musa, et al., 2020).

The onset of illness of Lassa fever typically comprises nonspecific signs and symptoms difficult to distinguish from many other febrile diseases. Some patients progress to severe vascular instability and multi organ system failure, with case fatality ratios in hospitalized cases reaching about 20%. These unspecific signs and symptoms make it difficult to recognize and diagnose in a typical hospital setting which puts healthcare workers at great risk (Musa, et al, 2020). Infection could occur six to twenty-one days after exposure to the virus (Dan-Nwafor, et al., 2019).

Eighty percent of infected people are mild or asymptomatic (Morgan, et al., 2018). Symptoms usually begin with flulike illness, fever, malaise, which may be accompanied by cough, sore throat, severe headache, chest and abdominal pain, vomiting, diarrhea; and may later result in bleeding from the mucosa openings, severe haemorrhagic fever, facial edema, multi-organ dysfunction, which could eventually lead to death (NCDC, 2020; Morgan, et al., 2018). Infection of fetus and loss of the fetus in 90% of cases in pregnant women is common (WHO, 2017).

Healthcare workers in Nigeria had a share of the burden of Lassa fever disease during the 2018 outbreak accounting for 7% and 5.8% of confirmed cases and case fatalities respectively (Dan-Nwafor et al., 2019; NCDC, 2019). This occurs mainly between individuals caring for sick patients although anyone who comes into close contact with a

person carrying the virus is at risk of infection (Ijarotimi, et al., 2018). Nosocomial transmission of Lassa fever in healthcare facilities represents a significant burden on the healthcare system. This disease over the years has caused infections and deaths of healthcare workers who are involved in treating and managing infected patients. Infection prevention and control (IPC) practices, training, and re-training of healthcare workers have been documented as important factors in controlling potential outbreaks of Lassa fever and other infectious agents within healthcare facilities (Ajayi, et al., 2013).

Good adherence to standard precautions and infection prevention and control (IPC) practices in healthcare settings has been identified as an important factor in the control of potential outbreaks of Lassa fever within the hospital setting. Poor health care workers' (HCWs) knowledge of the disease and infection control techniques is a major contributing factor to hospital-acquired Lassa infection. Report shows that the proportions of respondents with good knowledge, good attitude and good IPC practices among health workers were 4.4%, 63.3% and 41.2% respectively. Lassa fever has accounted for the deaths of a number of HCWs since it was discovered. It has resulted in the loss of quality healthcare manpower across many cadres in the health workforce (Aigbiremolen, et al., 2012).

Unfortunately, within health care setting, the transmission of the disease is promoted by non-adherence to standard precautions and poor infection prevention and control (IPC) practices. Adherence or non-adherence to IPC measures in healthcare settings has been identified as an important factor to be considered in the control potential outbreaks of Lassa fever. (Ajayi, et al., 2013). Contributing factors to hospital-acquired Lassa infection include poor knowledge of the disease and poor knowledge of infection control techniques on the part of the health facility personnel among others. In support of this, studies have shown that transmission of Lassa virus is minimal in hospitals with improved IPC practices. (Ijarotimi, et al., 2015).

The 2017/2018 Lassa fever outbreak in Nigeria was unprecedented; heralded by an initial report of a cluster of cases and deaths among healthcare workers in a tertiary health facility by week 2 of 2018 (Dan-Nwafor et al., 2019). At the end of 2018, 23 states within the country were affected by the Lassa fever outbreak. A total number of 3498 suspected cases were identified, of which 633 cases were confirmed with a case fatality ratio of 27% (171 deaths) (NCDC, 2019). Healthcare workers accounted for 7% and 5.8% of confirmed cases and deaths attributed to Lassa fever outbreak respectively, depicting substantial risk to healthcare workers. (Dan-Nwafor et al., 2019; NCDC, 2019).

Ondo State is one of the states in Nigeria where Lassa fever is endemic and 25% of the confirmed cases were recorded in the state (NCDC, 2019). Likewise, between January 2023, Governor Rotimi Akeredolu (SAN) distributed rat poisons to eradicate rodents to safeguard against Lassa fever in the state. In the year 2020, Lassa fever (LF) outbreak had the greatest disease burden and this can place an enormous strain on the already overstretched healthcare system and can potentially increase morbidity and mortality.

Nosocomial infection is a hospital-acquired infection that occurs among healthcare workers (HCWs), to patients or patient relatives through contact with contaminated

beddings or secretions (David & Famurewa, 2010). The control of hospital infection is very important and could be achieved through positive knowledge, and practice towards LF infection (Adebayo, et al., 2015). Positive medical attitude and practice will help to reduce morbidity and mortality resulting from LF (NCDC, 2020; David & Famurewa, 2010).

In view of the above, the transmission of Lassa fever in healthcare facilities represents a significant burden on the healthcare system, and a potential for sporadic outbreaks in different parts of the country (Iliyasu, et al., 2016). Iliyasu, et,al 2016; Fisher-Hoch, et al., (1995) studies identified that index cases of LF are usually from the community but LF outbreaks have been significantly related to hospital transmission. Evidence abounds that LF symptoms and signs are indistinguishable from febrile diseases such as malaria and other viral hemorrhagic fevers such as Ebola (Abdulkadir, & Mohammed, 2019; Iliyasu, et al., 2016). Approximately 80% of the symptoms are mild and such go often undiagnosed (WHO, 2020). Death can occur within two weeks of the onset of LF symptoms due to multi-organ failure (NCDC, 2020). According to World Health Organization, (2020) since LF presents with no specific symptoms, clinical diagnosis is often difficult especially at the onset of the illness. Accurate diagnosis of LF is enabled by differential laboratory testing, clinical manifestations, epidemiological findings since definitive diagnosis requires investigations available only in highly specialized laboratories.

Knowledge, attitude and prevention of transmission is of utmost importance in the control of the spread of LF, hence the universal precautions that have been outlined to protect health workers from contracting the infection (Ilesanmi, et al., 2021). The notion of infection prevention and control (IPC) has been defined as an attempt to limit the spread of disease inside communities or healthcare facilities. In the LF context, adherence to IPC measures such as the use of goggles, full-body PPE, face masks/face shields, boots, aprons, and gloves have been validated as a vital component of strategies for the control of potential outbreaks of LF. It has been reported that a major contributor to hospital-acquired LF infection is the poor knowledge of LF, and poor knowledge of IPC measures among healthcare workers (Ijarotimi, et al., 2018).

This occurrence is however unfortunate because HCWs are active agents of promoting compliance to disease preventive measures. If HCWs are then lacking in IPC for LF, how then could community members be empowered with sufficient health education on IPC measures needed to tackle LF? Hence, healthcare settings are potential sites for sporadic outbreaks of LF infection. In some instances, doctors have been reported to have displayed higher IPC practices than other groups of HCWs. Against this backdrop, this study assessed the knowledge, and practices of Lassa fever among Health Professionals in Badagry Local Government Area of Lagos.

Methodology

The participants used in this study were 100 Health professionals selected from Primary Health Centre and General Hospital in Badagry local Government Area of Lagos State. The purposive sampling technique was used to select the sample from Badagry General Hospital, Mowo Primary Health Centre, Iworo-Ajido Primary Health Centre, Ilogbo-Eremi Primary Health Centre and Ikoga-Sebe Primary Health Centre. A self- developed “Lassa

Fever Knowledge and Prevention Practices Questionnaire" (LFKPPQ) was used for collection of data. The instrument was divided into two sections, section A and B. Section A of the instrument focused on bio-data of all health professionals while section B of the instrument was used to collect information on the variables of knowledge and prevention practices of Lassa fever selected for the study. The questionnaire was a closed ended type designed in line with the modified Likert 4- point Scale of Strongly Agree, (SA), Agree-(A), Disagree-(D) and Strongly Disagree, (SD).

The questionnaire was validated for content and construct validity by professional colleague. To test the reliability of the instrument, the test-retest method was used. A total of 10 respondents from Primary Health Centre in Alimosho Local Government Area who were not part of the population of the study was used for the reliability test. Data collected from the first week administration of the instrument was collected and correlated with the second week instrument. The two data collected were analyzed using Pearson's Product Moment Correlation Coefficients [PPMCC] which yielded 0.84 coefficient after computation. For the demographic variables, the health facility/department, gender, age range, designation, marital status, and religion of the health professionals were collected. The analysis shows that a total of 20(20%) respondents were chosen from each of the health facility/department, and a total of 64(64%) of the respondents were female while a total of 36(36%) were male. Also, majority of the respondents were between the ages of 36-40(30%) years, and the distribution of questionnaire by designation shows a total of 11(11%) respondents were medical doctors, 48(48%) respondents were nurses/Health educator, 15(15%) respondents were pharmacist, 12(12%) were physiotherapist, while a total 14(14%) were other health professionals and implies that majority of the respondents were nurse/health educators. Informed consent was obtained from all the respondents selected from the healthcare facilities. Participants were allowed to participate voluntarily and there was no consequence for non-participation. All information obtained were kept confidential

Results

Result of the data and discussion of findings are presented below;

Hypothesis One: Health professionals in Badagry Local Government Area of Lagos State will not have significant knowledge of Lassa fever.

Table 1: Chi-square (X^2) results on health professional's knowledge of Lassa fever

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	184.436[a]	9	.000
Likelihood Ratio	181.578	9	.000
Linear-by-Linear Association	87.808	1	.000
N of Valid Cases	100		

a. 10 cells (62.5%) have expected count less than 5. The minimum expected count is .99.

The table showed that the Chi-square statistic X^2 (9) = 184.436 and p is ≤ 0.05. The null hypothesis which stated that health professionals in Badagry local Government Area will not have significant knowledge of Lassa fever was rejected, indicating that health professionals in Badagry Local Government Area of Lagos State have significant knowledge of Lassa fever

Hypothesis Two: Health professionals in Badagry local Government Area will not practice the basic hand hygiene of Lassa fever prevention

Table 2: Chi-square (X^2) results on health professional's practice of basic hand hygiene

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	148.650[a]	9	.000
Likelihood Ratio	152.080	9	.000
Linear-by-Linear Association	80.247	1	.000
N of Valid Cases	100		

a. 10 cells (62.5%) have expected count less than 5. The minimum expected count is 1.08.

The table showed that the Chi-square statistic X^2 (9) = 148.650, and p is ≤ 0.05. The null hypothesis which stated that health professionals in Badagry local Government Area will not practice the basic hand hygiene of Lassa fever prevention was rejected. This implies that health professionals in Badagry Local Government Area of Lagos State practiced the basic hand hygiene of Lassa fever prevention

Hypothesis Three: Health professionals in Badagry Local Government Area of Lagos State will not practice respiratory hygiene of Lassa fever prevention

Table 3: Chi-square (X^2) results on health professional's practice of respiratory hygiene

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	290.581[a]	9	.000
Likelihood Ratio	219.631	9	.000
Linear-by-Linear Association	96.764	1	.000
N of Valid Cases	100		

a. 12 cells (75.0%) have expected count less than 5. The minimum expected count is .81.

The table showed that the Chi-square statistic X^2 (9) = 290.581, and p is ≤ 0.05. The null hypothesis which stated that health professionals in Badagry local Government Area will not practice respiratory hygiene of Lassa fever prevention was rejected, indicating that health professionals in Badagry Local Government Area of Lagos State practiced the basic hand hygiene of Lassa fever prevention.

Hypothesis four: Health professionals in Badagry local Government Area of Lagos State will not use personal protective equipment to prevent Lassa fever

Table 4: Chi-square (X^2) results on health professional use of personal protective equipment

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Chi-Square	112.532[a]	9	.0160
Likelihood Ratio	110.423	9	.0140
Linear-by-Linear Association	11.362	1	.001
N of Valid Cases	100		

a. 9 cells (56.3%) have expected count less than 5. The minimum expected count is 1.26.

The table showed that the Chi-square statistic X2 (9) = 112.532, and p is ≥ 0.05. The null hypothesis which stated that health professionals in Badagry local Government Area will not use personal protective equipment to prevent Lassa fever was accepted which implies that health professionals in Badagry local Government Area do not use personal protective equipment to prevent Lassa fever.

Discussion of Findings

Hypothesis one which stated that health professionals in Badagry Local Government Area of Lagos State will not have significant knowledge of Lassa fever was rejected, indicating that health professionals in Badagry local Government Area have significant knowledge of Lassa fever. This finding was in line with Ekuma et al., (2017) study which determined the knowledge, attitudes and practices toward Lassa fever and infection control among medical doctors and students in Uyo, Akwa Ibom, Nigeria, using a questionnaire for data collection and found good knowledge of Lassa fever among the respondents. Onyire, et al., (2013) assessed the knowledge and perception of Lassa fever among clinical students of the University of Benin, Benin City, Nigeria, using a cross-sectional descriptive study with a self-administered questionnaire to obtain data, which revealed a good knowledge of Lassa fever among the students. This study negates that of Akunne, et al., (2018) who conducted a cross-sectional survey to assess the knowledge of Lassa fever among undergraduates in

the University of Nigeria Nsukka (UNN) with students in three faculties (Pharmacy, Medicine, and Health Sciences) between July and October 2016 using a self-administered questionnaire. Results showed that the overall knowledge of Lassa fever infection was poor among the students. This study also negates Ighedosa, et al., 2017), who conducted a cross-sectional epidemiological study to assess the knowledge, attitude, and practice of prevention of Lassa fever, among students' resident in two campuses of the University of Benin, Edo State, Nigeria, with a sample of 300 students using a pretested structured questionnaire for data collection, but found that they had poor knowledge of Lassa fever.

Hypothesis two which stated that health professionals in Badagry Local Government Area of Lagos State will not practice respiratory hygiene of Lassa fever prevention was rejected. This implies that health professionals in Badagry local Government Area practice respiratory hygiene of Lassa fever prevention. This finding is in support of Ijarotimi, et al., (2018) study which reported that a major contributor to hospital-acquired LF infection is the poor knowledge of LF, and poor knowledge of IPC measures among healthcare workers**.** Ireye, et al., (2019) who reported that the proportions of respondents with good knowledge, good attitude and good IPC practices among health workers were 4.4%, 63.3% and 41.2% respectively. Ireye, et al., (2019) asserts that infection prevention and control (IPC) has been described as a concept which aims at containing disease transmission either in health facilities or in communities. In the LF context, adherence to IPC measures such as the use of goggles, full-body PPE, face masks/face shields, boots, aprons, and gloves have been validated as a vital component of strategies for the control of potential outbreaks of LF.

Hypothesis three which stated that health professionals in Badagry Local Government Area of Lagos State will not practice respiratory hygiene of Lassa fever prevention was rejected. This implies that health professionals in Badagry local Government Area practiced respiratory hygiene of Lassa fever. This finding corroborates Ireye, et al., (2018) who reported that about 183 (96.3%) routinely use gloves when handling body secretions and contaminated items while, 171 (90.5%) routinely washed hands before and after all procedures. Only 86.3% routinely disposed all sharps into sharps bin. Sixty percent of respondents routinely used gown and boots during a procedure while 116 (61.1%) routinely used facemask and eye protection during such procedures as well**.** Ireye, et al., (2019)who asserts that infection prevention and control (IPC) has been described as a concept which aims at controlling disease transmission either in health facilities or in communities. In the LF context, adherence to IPC measures such as the use of goggles, full-body PPE, face masks/face shields, boots, aprons, and gloves have been validated as a vital component of strategies for the control of potential outbreaks of LF.

Hypothesis four which stated that health professionals in Badagry local Government Area will not use personal protective equipment to prevent Lassa fever was accepted. This indicates that health professionals in Badagry local Government Area do not use personal protective equipment to prevent Lassa fever. This finding is in line with Ijarotimi, et al., (2018), study on health facilities in which they reported that a total of 59 had soap for hand-washing, but 7 (11.9%) did not have water out of which 6 (85.7%) were government-owned facilities and all were primary facilities. Wash-hand basin was available

in 57 (96.6%) and 52 (88.1%) had water available. Two (3.4%) of the facilities did not have gloves. Only 20 (33.9%) had chlorine solution, 52 (87.2%) of these were government-owned facilities and primary facilities respectively. No health facility had all Infection Prevention and Control (IPC) requirements. Akhuemokhan, et al., (2017) study in health care settings, found that transmission from person-to-person (nosocomial transmission) is common due to unavailability and improper use of proper personal protective equipment (PPE).

Conclusions

Based on the findings of this study, the following conclusions were made:

1. Health professionals in the Study Area were found to have the knowledge of primary route of transmission of Lassa fever which is through contact with infected rodents feaces, urine, or blood, practice basic hand washing measures to prevent the nosocomial transmission of Lassa fever, practice respiratory hygiene and majority were not regularly using personal protective equiptment. Based on the conclusions from the study, it was recommended that:
   Management of health facilities in the area should organize in-service training for all health professionals on Lassa fever, health facility management in Badagry Local Government Area should provide personal protective equipment for their staff. E.g, wearing of personal protective equipment that should be made compulsory for all personnel during working hours while hand washing facilities should be provided in all health facilities for easy hand washing.

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