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Full Length Research Paper

Assessment of knowledge and attitude towards Lassa fever among Primary care providers in an endemic suburban community of Edo state: implications for control

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ABSTRACT

The study set to assess the knowledge and attitude to Lassa fever among primary care providers. Structured questionnaires were administered to consenting primary care workers in Private and Primary health centres in Ekpoma. Data analysis was carried out using SPSS version 15. One hundred and thirty five (135) health workers participated in the study. One hundred and thirty one (97.0%) respondents had previously heard of Lassa fever. Overall knowledge of Lassa fever was poor for 51 (38.9%), and fair for 54 (41.2%) and good for 260 (19.8%). Hand gloves were stated as the most useful personal protective gear when dealing with a patient with Lassa fever. Fifty six (42.7 %) felt their level of knowledge was sufficient for them to safely and effectively handle a patient, 126 (96.4%) expressed their desire to know more about Lassa fever. The primary care health worker in a rural area is the one most likely to be the first point of call for persons seeking orthodox medicine. It is therefore essential that he is adequately informed about the disease, it's presentation and prevention.

Keywords: Attitude, Endemic, Knowledge, Lassa fever, Primary care.

INTRODUCTION

Lassa fever is an acute viral hemorrhagic illness caused by Lassa virus, a member of the virus family Arenaviridae. The disease is endemic in Sierra Leone, Guinea, Liberia, and Nigeria (Bowen et al. 2000) where The number of Lassa Fever virus infections per year is estimated at 100,000 to 300,000 with approximately 5,000 deaths (Bowen et al., 2000; Gunther et al., 2000; World Health Organisation (WHO), 2005, WHO, 2000). Outbreaks have been reported in Ghana, and serological evidence of human infection has been found in Ivory coast , Senegal and Mali. (Richmond and Baglole, 2003). The virus has also been imported into countries where it is not endemic, for example, by returning travelers (Gunther et al., 2000). The virus exhibits persistent, asymptomatic infection, with profuse urinary virus excretion in *Mastomys natalensis*, the ubiquitous and highly commensal rodent host (Keenlyside et al., 1983; Monath et al., 1974). The virus is shed in their excreta (urine and feces), which can be aerosolized and inhaled by humans (Viral haemorraghic fever consortium, 2011) .Primary mode of spread is from rodent to man through contact with rodent excreta or urine in food or during hunting and processing of rats for consumption. The virus has the capacity for person-to-person spread, either within households during care for sick relatives or in health care settings (Fischer-Hoch, 2005). Percutaneous or per-mucosal exposure to blood and other infected body fluids, especially if the fluids contain blood, can result in secondary human spread. This type of transmission is the most likely route in health care settings (Aranoff et al., 1997). This nosocomial hazard can be minimized by proper and timely infection-control measures, careful management of infected patients, and, in some cases, administration of

prophylactic therapy to health care workers after exposure (Weber and Rutala 2001; Morbidity and Mortality Weekly Review (MMWR) 1988). Lassa fever presents at it's early stage with symptoms and signs indistinguishable from those of other viral, bacterial or parasitic infections common in the tropics such as malaria, typhoid and other viral haemorrhagic fevers (Richmond and Baglole, 2003). Laboratory testing is required for confirmation. Untreated, Initial flu-like and gastrointestinal symptoms give way to bleeding, organ failure and neurological complications (Bausch et al., 2001). The drug ribavirin is effective if administered early following infection (McCormick et al., 1986). When the disease is in an advanced stage, even state-of-the-art intensive care cannot prevent a fatal outcome. A suspect must be rapidly excluded or verified to facilitate appropriate case management, including treatment, the implementation of isolation measures, or the tracking of contact persons (Haas et al., 2003). Late diagnosis and treatment also increases the likelihood of secondary transmission, including nosocomial transmission. It is therefore imperative that health care workers in endemic communities are adequately sensitized on the disease, it's clinical features and diagnosis.

Lassa fever is commonly found in rural communities, where the over 70% of the population resides (Kelly et al., 2003). The focus of research into awareness of Lassa fever has been till date population based, and shown varying degrees of knowledge. There has been no published study on the level of knowledge among health workers, and particularly, primary care providers. This has much implications for limiting mortality from Lassa fever, as the greater proportion of people live in the rural communities, where poverty prevails and standards of living are low. In those communities, assess to orthodox medicine is commonly through the Private practitioner's clinic or the Primary health centre. These are more likely to be few in number, ill-equipped and under staffed. When these health providers are themselves ignorant of the disease, the tendency to misdiagnose and treat wrongly not only puts the health worker at risk, but also endangers the lives of the close family contacts and community at large. Till date, there has been no published study to assess the knowledge primary care givers in these rural communities have of Lassa fever. Moreso, the emergence of highly virulent and contagious Lassa virus in many more districts and states in endemic countries of the West African sub-region and the increasing sporadic cases of Lassa fever outside the endemic regions within and outside Africa as a result of huge inter-border traffic and international travels, necessitates that health care providers should have comprehensive information about the virus and the disease it causes. Furthermore, Lassa virus has been associated with nosocomial outbreaks with high mortality, hence, early identification of infected individuals is important for prompt implementation of appropriate barrier nursing guidelines (Fischer-Hoch et al., 1995; Mertens et al., 1973; White, 1972).

Since Lassa fever was first described, medical practice in much of rural and urban Africa, including Nigeria, has grown substantially, with proliferation of small hospitals and clinics run often with emphasis on profit, and which employ staff with little formal education or professional training outside of the meagre experience gained at their workplace. In Nigeria these shoulder a large burden of the medical care of the most populous country in Africa (Fischer-Hoch, 1995).

The study therefore set out to assess the knowledge and attitude towards LF among primary care provider in an endemic Local Government Area (LGA) in Edo state.

METHODOLOGY

Study area

The descriptive cross sectional study was carried out in Esan west LGA of Edo state, Nigeria in 2011. With headquarters as Ekpoma, the LGA occupies a land mass of 502km^2 and has a population of 147,655(National Population Commission, 2006). She is bounded on the west by Esan central LGA, on the east by Uhunmwode LGA , the northwest and north east by Owan east and Estako-west respectively and on the south by Igueben LGA. The LGA is divided into 10 political wards. The people are mainly farmers, and Esan speaking. Ttraditional or Christian religions are predominant with only a few Muslims in Ekpoma. Basic amenities, such as piped water, electricity and good roads, are inadequate or non-existent. There are 19 private clinics and 23 primary health centres in the local government area. There are also several private laboratories and patent medicine dealers.

Study population

The study population included health care workers in private, and government owned primary health care facilities in Esan west LGA. The cadre of health workers required for the study were doctors, nurses (trained and auxiliary), laboratory personnel, as they were directly involved in clinical patient care or specimen collection.

Selection criteria

Selection criteria for the health workers was to be a full time employee in the private and government owned primary health care facilities in the LGA for at least one month, and willing to give consent for either blood or questionnaire survey or both. Health workers

who were absent on the day of the study were exempted.

Sample size

Sample size for the study was calculated using the formula for descriptive study for populations less than 10,000 (Cochrane, 1963) with p as 71.0%, being the proportion of health workers with good knowledge of Crimean Congo haemorraghic fever in a study carried out in Turkey (Sheikh et al., 2004), z as 1.96 representing a 95% confidence interval, a desired precision of 10%, and a 10% non-response rate. Sample size was increased to 200 for validity.

Sampling technique

A list of all private owned and government primary health care facilities was obtained from the Health department of the Local government. Fifty percent of both facility types were selected by random sampling. Of those selected, proportional allocation was used to determine the number of respondents required from each facility. Respondents were selected from each facility by random sampling.

Data collection

Data was collected using structured interviewer administered questionnaire focusing on demographic characteristics, knowledge of Lassa Fever, and infection control practices. Knowledge of Lassa Fever was assessed using a set of 27 questions ranging from agent and symptoms of Lassa Fever to mode of transmission and methods of prevention at community and health facility levels. Questions were designed after an intensive literature review by the research team.

Data analysis

Data from the questionnaires and laboratory data were coded and entered into a spread sheet and analysed using SPSS version 15(SPSS, Inc., Chicago, IL, USA). Age, type of facility (private clinic or primary health centre), designation, years of experience and gender were considered independent variables that could have an influence on Lassa fever knowledge level. Each correct answer out of 45 questions about Lassa Fever was given one point , an incorrect or no response scored zero. The points were summed up, a maximum score was 45 points. These final scores were considered the “Lassa Fever knowledge score”. A similar scoring system was used in a study to assess knowledge of Dengue fever among health workers in Taluka (Kakade, 2012). Total possible score for knowledge was 45. Scores were re-categorized as poor knowledge if between 0- < 50% of total, fair knowledge between $\geq$ 50 and < 75% and, excellent knowledge $\geq$ 75%.

Descriptive data were presented as charts and in frequency distribution tables. Means and standard deviation or median were calculated for continuous variables. Chi-square test of association, with p set as < 0.05 was used to ascertain associations between demographic variables and grade of knowledge.

Ethical clearance

Ethical assent was obtained from the Irrua Specialist Teaching Hospital Ethical committee. Consent was also obtained from Medical directors of the health institutions, and Primary health care Coordinator of the Local Government Area. Informed consent was obtained from all participants. They were told that information given will be treated as confidential and of their right to withdraw from the study any time they wished.

RESULTS

One hundred and thirty five (135) health workers participated in the study. Mean age of respondents was 34.5 $\pm$ 10.9 years. One hundred and seven (79.3%) were females. A greater proportion, 68 (50.4%) had tertiary level of education, 125 (92.6 %) were Christians, the majority, 106 (78.6%), were of Esan origin, and 83 (61.5%) were married. Mean duration of employment was 6.4$\pm$ 8.5 years. Nurses accounted for 48 (34.1 %) janitors/orderlies, 34 (25.2%), auxiliary nurses 27 (20.1%), doctors and laboratory personnel 14 (10.4%) each.

One hundred and thirty one (97.0%) respondents had previously heard of Lassa fever. These respondents were further asked a set of 45 questions regarding the disease, its management and the necessary precautions to prevent its spread. Fellow health workers were the source of information on Lassa fever for the majority, 79(60.8 %). Other sources included radio 8(6.2%), television 19 (14.6%), print media, 5 (3.8%) and public health campaigns and enlightenment programmes 8 (6.2%) and the school for 12 (8.4%).

Sixty eight (51.9 %) respondents correctly knew the cause to be viruses, 113 (86.3 %) knew the vector of LF to be the rodent. Only 41 (31.3 %) could correctly state the incubation period of the disease, as one to three weeks.

Commonly recognised modes of transmission of the disease within communities were the consumption of contaminated foods by 83 (63.4%), spreading food uncovered on ground /surfaces, 80 (61.1%,), and usage of contaminated utensils for food 78 (59.9%). Less common modes included contact with infected

Table 1. Socio-demographic characteristics of respondents

Variable	Frequency (%)
Age	
15 - 24	20 (14.8)
25-34	49 (36.3)
35-44	35 25.9)
45- 54	22 (16.3)
≥ 55	9 (6.7)
Sex	
Male	28 (20.7)
Female	107 (79.3)
Type of facility	
Private owned	93 (68.9)
Primary health centre	42 (31.1)
Designation	
Medical doctor	14 (10.7)
Nurse	45 (34.4)
Laboratory technologist/scientist	33 (25.2)
Auxiliary nurse	14 (10.7)
orderly	25 (19.1)

persons, 70 (53.4%), though handling corpses, 66 (50.4%), and hunting rodents, 64 (48.9%).

Commonest mode of transmission within health care settings was said to be through unprotected contact with infected body fluids, 90 (68.4 %),closely followed by use of contaminated medical equipment for procedures by 84 (64.1%) respondents. Seventy-two (55.0%) mentioned inappropriate disposal of waste, while less than 50% knew of transmission through improper handling of soiled beddings.

Nine (6.9%) of respondents were aware of the possibility of subclinical illness, while 103 (78.6%) opined that Lassa fever always caused clinical illness. Most common symptoms associated with LF known by the respondents was fever unresponsive to antimalarials by 85(64.9%) respondents, least mentioned symptom was spontaneous abortion by only 40 (30.5%) respondents Table 2.

Knowledge of methods for the laboratory diagnosis of LF was low, with 43 (32.8 %) aware of the use of Polymerase Chain Reaction. Less commonly mentioned were Elisa, 32 (24.4%) and viral culture by 26 (19.8%).

One hundred and two (78.0%) knew there was a drug to treat Lassa fever, however only 52 (39.7%) could correctly give the name of the drug as ribavirin. The absence of a vaccine for the disease was known to 47 (35.9%).

Most common mode of prevention within communities was cited as the proper storage of food by 111 (84.7%). Least mentioned was the avoidance of bush burning , 60 (45.8%).

Precautionary measures to be taken to prevent spread in health care facilities, were stated as adequate health education and good hand washing practice by 100 (76.3%) and 91 (61.5%) respondents respectively. Barrier nursing was the least mentioned Table 2.

One hundred and thirteen (86.3%) and 120 (91.6%) respondents respectively were aware that there was no sex or age predilection with LF, and mortality was high for untreated cases.

Though the majority, 129 (98.5%), opined burial in a coffin to be the preferred method of disposal of a Lassa corpse, as opposed to cremation as suggested by 3 (1.5%), 113 (86.0%) respondents did not know of any special precautions to take during burial of a deceased patient.

Respondents were asked which personal protective equipment were necessary when dealing with a suspected case of Lassa fever, the majority stated hand gloves, 110 (84.0%). Those who advocated the use of gowns were 57 (43.5%) in number, Nose mask, goggles and caps were mentioned by 51 (38.9%), 18 (13.7%) and 16 (12.2%) respondents respectively.

Fifty six (42.7 %) felt that their level of knowledge was sufficient for them to safely and effectively handle a Lassa fever patient. One hundred and twenty six (96.4%) expressed their desire to know more about Lassa Fever. When asked to identify reliable sources from which they could obtain further information on Lassa Fever, 59 (45.2 %) of respondents suggested that they would seek further information from trainings organised by medical professionals, 41 (31.0%) would look for

Table 2. Respondents' knowledge of symptoms and preventive measures

Variable	Frequency (%)
Knowledge of symptoms	
Fever unresponsive to antimalarials or/ and antibiotics	85 (64.9)
Retrosternal chest pain	49 (37.4)
sore throat	61 (46.6)
Bleeding from orifice	69 (52.7)
Facial swelling	47 (35.9)
Spontaneous abortion	40 (30.5)
Knowledge of community prevention of LF	
Safe food storage	111 (84.7)
Maintenance of clean environment	98 (74.8)
Good housing standards	84 (64.1)
Avoidance of rodent consumption	69 (52.7)
Avoidance of bush burning	60 (45.8)
Method of prevention of LF in health facilities	
Health education	100 (76.3)
Adequate hand washing	91 (69.5)
Safe injection practices	89 (67.9)
Use of dedicated equipment for each patient	85 (64.9)
Personal Protective equipment	85 (64.9)
Barrier nursing	69 (52.7)
Isolation	71 (54.2)

Table 3. Association between the knowledge and socio-demographic variables

Variable	Level of knowledge			Total	P value
	Poor n (%)	Fair n (%)	Good n (%)		
Sex					
Male	11 (39.3)	12 (42.9)	16 (18.0)	28 (100.0)	0.95
Female	46 (38.8)	42 (40.8)	21 (20.4)	103(100.0)	
Age					
15 - 24	6 (31.6)	8 (42.1)	5 (26.3)	19 (100.0)	0.59
25-34	17 (36.2)	21 (44.70	9 (19.1)	47 (100.0)	
35-44	15 (42.9)	12 (34.3)	8 (22.9)	35 (100.0)	
45 - 54	12 (57.1)	7 (33.3)	2 (9.5)	21 (100.0)	
≥ 55	1 (11.1)	6 (66.7)	2 (22.2)	9 (100.0)	
Type of facility					
Private-owned	35 (39.3)	38 (42.7)	16 (18.0)	89 (100.0)	0.72
PHC	16 (38.1)	16 (38.1)	10 (23.8)	42 (100.0)	
Designation					
Medical doctor	1 (7.10)	9 (64.3)	4 (28.6)	14 (100.0)	0.11
Nurse	18 (40.0)	18 (40.0)	9 (20.0)	45 (100.0)	
Orderly	11 (33.3)	16 (48.5)	6 (18.2)	33 (100.0)	
Laboratory technologist/scientist	8 (57.10	2 (14.3)	4 (28.6)	14 (100.0)	
Auxiliary nurse	13 (52.0)	9 (36.0)	3 (12.0)	25 (100.0)	

information on the internet, 17 (12.6 %) would look to text books for information, 8 (5.9%) and 7 (5.3%) would use the broadcast and print media respectively

Overall knowledge of Lassa fever was poor for 51 (38.9%), and fair for 54 (41.2%) and good for 260 (19.8%). Knowledge was not significantly associated with designation ($p = 0.11$) age ($p = 0.59$), sex ($p = 0.95$), or type of facility (0.43) Table 3.

DISCUSSION

The public health significance of the disease, Lassa fever, lies not only in it's potential to cause significant mortality and morbidity at community level , especially during outbreaks, but also it's potential for nosocomial spread. It is therefore important that health workers in endemic communities are conversant with the disease, it's manifestations and management and prevention. Maintaining a high index of suspicion can only be based on adequate knowledge of the disease. Patient counselling and community campaigns should only be carried out by health workers who are themselves adequately informed of the disease.

The greater number of female to male workers is a reflection of the differential role of gender in the health profession in Nigeria, where females are more likely to be nurses, auxiliaries and orderlies than males. With this in mind, the design of the mode of information transfer should be more of audio-visual so as to facilitate easy assimilation and recall.

Though no published study assessing knowledge of Lassa fever among health works was found, comparisons can be made with studies carried out on other viral haemorraghic fevers. The study showed less than 20% of primary care health workers assessed to be knowledgeable of the disease, though 97% had heard of the disease. This disparity between the number of persons who are aware of a disease and those having indepth knowledge is common among health workers, and makes it imperative that the focus should not just be on creating awareness of the disease , but ensuring that the depth of knowledge is such that the health worker can effectively disseminate the information to others. A study carried out to assess knowledge of Crimean-congo fever among health workers in Iran found a similar picture, with about 94% aware of the disease, though about 50% had good knowledge of the disease (Rahnarardi et al., 2008).

The study found close to half of the health workers to have fair knowledge, with those having poor knowledge following closely, and those with good knowledge, the least. In terms of proportions, a similar trend has been reported in other studies (Kakade, 2012; Kongsap, 2006). In contrast, over 68% of 144 primary health workers in Turkey were found to have good knowledge of Dengue (Hidiroglu et al., 2012) and Primary care Physicians in Singapore were found to have adequate knowledge of Dengue fever (Lee et al., 2011). The apparent higher levels of knowledge in the latter studies may be due to the greater attention given those disease, both by the governments of those countries and by the academia. Lassa fever in Nigeria is yet to gain the political attention it deserves by all tiers of government.

The greater involvement of health workers as source of information on Lassa fever has been similarly reported in a study on Dengue (Kongsap, 2006) may not be unconnected to the proximity to the Institute of Lassa fever research and control of the Irrua Specialist Teaching Hospital. The institute has been involved in organisation of sensitization programmes for health workers in affected LGAs. However, the gaps in knowledge identified by this study highlights the need for a critical look into the content and delivery of health information, as such gaps may in fact inadvertently place the health worker at more risk by giving a false sense security. It is also important that health workers are encouraged to assess other media for mass communication, particularly the internet, as new technologies and development as well as reports and findings from other countries /regions may be available.

The mention of use of gloves for personal protection by the majority of health workers in this study is similar to what was reported among nursing and midwifery students in a study carried out in Kahramanmares, Turkey (Ozeer et al., 2011) and among health workers in Iran (Rahnarardi et al., 2008) and higher than was reported in a study carried out among healthcare personnel in Balochistan (Sheikh et al., 2004). The preference for other personal protective equipment (PPE) in that study closely resembled what was reported in Balochistan (Sheikh et al., 2004). While the hand glove is an essential component of the PPE, Standard personal protective gear for any viral hemorrhagic fever management should include a scrub suit, gown, apron, rubber boots, head covering, mask, eyewear, and two pairs of gloves (World Health Organisation, 1998). The low mention made of other PPE might be as a result of their unavailability in the facility (Borchet et al., 2007; Hewlett and Hewlett, 2005) and ignorance as to the significance of the protective gear in the prevention of infection . Sadly, many health facilities in the country, especially those in rural areas, have limited supplies of protective gear , most often as a result of limited finances, making implementation of infection control difficult, and exposes the health workers to the risk of infection. Emphasis should be laid on the application and proper use of PPEs in any intervention aimed at improving knowledge of the disease among primary care workers .

Lassa fever causes clinical illness only in 20 % of cases, a fact that was unknown to the majority. This gap in knowledge needs to be adequately addressed through trainings for frontline health officers, as many cases would otherwise go undiagnosed as a result of a low index of suspicion.

The lacunar in knowledge regarding burial practices in this study was noted, and should be included in health education messages for health workers. Similar findings have been observed in other studies on Crimean –Congo fever (Sheikh et al.,

2004). This finding has important implications for spread of the disease in communities. Standard burial practice involves decontamination of the body using 1:10 bleach solution and placement in a body bag. which is similarly decontaminated and placed in a coffin where this is available and culturally appropriate(Health Protection Agency, 2004; WHO, 1998) Families have got themselves infected unknown to them through the conduct of traditional rites, such as washing or touching the body. It is important that the health worker is adequately informed, so that he can counsel the family of the deceased.

Respondents were generally ignorant of the non-existence of a vaccine for the disease. In contrast, awareness of the absence of vaccine for Dengue fever was high among nursing and midwifery students in a study carried out in Turkey (Ozeer et al., 2010). The absence of a vaccine calls for higher attention to prevention of infection particularly among health workers.

The better knowledge observed among doctors, though not significant, has been reported in other studies (Hidiroglu et al., 2012; Ho et al. 2013; Lakhani et al., 2003; Rahnarardi et al, 2008; Sheihk et al., 2004) Doctors are the leaders of the health team, with higher levels of training and exposure. It is not surprising then that they would exhibit better knowledge. While some may argue that it may not be necessary for orderlies to have much information as they are not involved in clinical decision making, this claim may be refuted on the ground that improving their knowledge makes them better information channels in their communities.

CONCLUSION

Lassa fever is endemic in Nigeria. The primary care health worker in a rural area is the one most likely to be the first point of call for persons seeking western medicine. It is therefore essential that he is adequately informed about the disease, it's presentation and prevention, so that he can not only protect himself, but prevent spread within the community.

The study revealed a general lack of good knowledge among the health workers with obvious gaps in knowledge. There is an urgent need to increase knowledge level among healthcare personnel regarding Lassa Fever, including the housekeeping staff through the provision of education campaigns consisting of seminars, pamphlets and workshops that would pay added attention to bridging gaps in knowledge.

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