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The Level of Awareness that Rat is a Vector of Lassa Fever among the Rural People in Ijebu-North Local Government, Ogun State, Nigeria

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Abstract
The study investigates the level of awareness that rat is a vector of Lassa fever among the rural people of Ijebu-North Local Government Area in Ogun State. A total of 120 people were purposively selected to cover the two constituencies of the area. Two hypotheses were raised and tested at 0.5 level of significance. A 20-item structured questionnaire on people's awareness level of rat as Lass fever vector was used. The t-test statistics was used in data analysis. The result showed that literate and illiterate rural dwellers irrespective of gender had no awareness of rat as vector of Lassa fever. Among the recommendations made was that serious enlightenment campaigns on the danger of rat as Lassa fever vector should be intensified among rural people and efforts to be made to enthuse them to avoid spreading of food stuffs along road sides and patronize clinics in the event of illness.

Introduction

For the past three decades, Nigeria and many sub-Saharan Africa had been under the canopy of epidemic which shed them from rapid development. Many citizens in most of these countries have been ravaged by diseases such as measules, whooping cough, malaria, yellow fever, typhoid fever, HIV/AIDS, Lassa fever, polio etc. The prevalence of some of these endemic diseases has attracted the attention of the World Health Organization (WHO), its specialized agencies and research scientists (epidemiologist). Several programmes have been put in place among African nations to reduce and eradicate the havoc these diseases had caused humans. Among these are Operation Roll Back Malaria, Expanded Programme on Immunization (EPI) and free treatment to people with whooping cough, HIV/AIDS, Leprosy in addition to free distribution of treated mosquito nets to millions of people.

In Nigeria, apart from setting up of the Presidential Council on AIDS (PCA), HIV Emergency Action Plan (HEAP) and National AIDS and STD Control Programme (NASCP) in response to the scourge, the government has also set up a three-tier committee. At the national level, the National Action Committee on HIV/AIDS (NACA), State Action Committee (SACA) and the Local Government Action Committee (LACA) was established to respectively coordinate and address the problem of HIV/AIDS at the federal, state and local government levels (Falaye, 2004). Also media publicity on the dangers of mosquito as a vector of malaria fever in the tropics was carried out to sensitize Nigerians immediately after the summit on Operation Roll Back Malaria held in Abuja, in the year 2000, Although no conscious effort by the various health ministries to carry out the message to the grassroots, who were the most vulnerable of the population to the scourge of malaria live ((Falaye, 2004, Godwin, 2005). This was followed by free distribution of treated-mosquito nets to millions of households. In the same vein, immunization against polio was fervently pursued. Little or no awareness has been created among people about Lassa fever which is equally endemic in many parts of Nigeria.

Lassa fever as an endemic acute viral hemorrhagic disease was first discovered in Sierra Leone in the 1950s but the virus responsible for the infection was not known until 1969 when it claimed the lives of two missionary nurses. This fever was named after a village called Lassa in Borno State, Nigeria. Subsequent outbreaks of the disease were recorded in Liberia and Sierra Leone. Lassa fever cases have equally been reported in the United States of America. It has claimed many lives, not only in Nigeria but in other parts of West Africa. Health records have indicated that many have lost their lives to the infection oblivious of it (Oyetimi, 2012).

As noted by Ehichioya, Hass, Olschlager, Becker-Ziaja, Onyebuchi Chukwu, Nasidi, Ogugua & Gunther (2010), 3 disease-endemic zones exist within Nigeria: the north-eastern region around Lassa, the central region around Jos and the southern region around Onitsha. The outbreak of Lassa fever was widely noticed around these regions. Between 2005 and 2008, the epidemic was witnessed in some states like Kano, Nassarawa, Plateau, Ogun and other towns like Onitsha in Enugu State, Abo Mbaise and Owerri in Imo State, and Ekpoma in Edo State.

The Federal Capital Territory was not left out as nine cases were reported, with two infected persons died. Furthermore, in 2010, this deadly disease has claimed over seventeen (17) lives in Kebbi State, 22 lives in Irrua Specialist Hospital, Edo State between January, 2011 and February 2012 (Akpede, 2012). A man was also confirmed died of Lassa fever on August 30th, 2012 in Oyo State (Oguntola, 2012). Its outbreak was also reported in Markurd, Benue State in January, 2013 (Duru & Olowoopejo, 2013). This disease not only claimed

the lives of infected people, four (4) doctors at the National Hospital, Abuja, two (2) doctors at Ebonyi State University Teaching Hospital (EBSUTH) and a medical personnel at the University of Benin Teaching Hospital (UBTH) were said to have died due to lack of proper infection control. This shows that its outbreak has spread to all geo-political regions of Nigeria.

The situation of Lassa fever in Nigeria is captured by Ibeabuchi (2012) while presenting the report of Pest Control Association of Nigeria, (PECAN) lamented that no fewer than 3,000 Nigerians died annually from Lassa fever. This statistics is quite alarming when compared with the report of WHO (2012) that between 300,000 to 500,000 cases of Lassa fever and 5,000 deaths occur yearly across the West African sub- region. According to WHO, in fatal cases, death usually takes place within 14 days of onset. It further argued that the disease is especially severe late in pregnancy which would invariably lead to foetal or maternal death in over 80 percent of cases in the third trimester. This further supported the earlier findings of Ehichioya, et al (2010) on the characteristics of Lassa fever in Nigeria as shown in appendix 1.

The mastomys rat which lives in and around many homes in Africa has been identified as the carrier of the virus. Medical experts according to Adebiyi (2012) & Ogunyedeka (2012) indicate that contracting the fever usually occurs through coming in contact with the multimammate rat's excreta or urine. The virus is usually contained in the urine and droppings of the mastomys rodents. Humans can easily get infested when these rats make droppings or urinate on foods that are meant to be consumed. Coming in direct contact with these droppings can also lead to infection. Touching open sores or cuts could lead to its transmission. Since these rodents can be found around homes, they usually scavenge on human food wastes or poorly stored food. The infection could be airborne when sweeping the droppings of these rodents; the particles of such droppings could be inhaled thereby leading to infection (Oyetimi 2012; Adebiyi, (2012)).

Lassa fever is not gender or sex specific as it occurs both in men and women. Individuals who stand at greater risk are those who live in overcrowded environments, slums, and rural areas where sanitation is not only poor but are lacking. The rodents which carry the Lassa virus largely thrive in such places. It is the common practice of many farmers in rural areas in Nigeria to spread their farm products especially pepper, melon, maize, and tubers meant to be processed into flour along road sideways to dry. This practice easily encourages the contamination of the foodstuff by the virus-carrying rodents which come out of a nearby bush to feed on them thereby aiding transmission.

The Federal Government and the various State Governments have embarked on sensitization of residents of the states on the preventive and proactive measures to be taken against the outbreak of the fever. Knowing the awareness among rural people that rat/rodent is a vector of Lassa fever should be the first step in the fight against Lassa fever.

Statement of the Problem

While the search for a potent vaccine continues unabated, it is instructive and worthwhile, as a baseline measure to investigate the extent to which the rural people in Nigeria associate the prevalence of common rat that lives in and around their homes as the prime carrier of a causative agent of Lassa fever. In order words, this study investigated the level of awareness that rat is a vector of Lassa fever among the rural people in Ijebu-North Local Government of Ogun State, Nigeria. In addressing this problem the following hypotheses were postulated:

- There is no significant difference in the mean scores of literate and illiterate respondents in their levels of awareness that rat is vector of Lassa fever.
- There is no significant difference in the mean scores of male and female respondents in their levels of awareness that rat is a vector of Lassa fever.

Method

The study adopted descriptive survey design which involved the use of a structured questionnaire. Six villages in Ijebu-Igbo and Ifelodun constuencies of Ijebu-North, Local Government were purposely selected based on their linear structure and farmers' characteristics. 120 people involved in the study, purposive sampling, based on the two variables of literacy and gender was equally applied in selecting 20 respondents from each of the villages.
In all, the sample size was further categorized into four; 30 each representing literate, illiterate, male and female as shown in table 1.

Table 1: Names of Villages, number and categories of interviewees

		Categories of Interviewees				
Names of Villages	**No of People**	**Literate**	**Illiterate**	**Male**	**Female**	**Total**
Osun budepo	20	5	5	5	5	20
Tesehin	20	5	5	5	5	20
Timope	20	5	5	5	5	20
Togunberu	20	5	5	5	5	20
Mamu	20	5	5	5	5	20
Ajegunle- Awa	20	5	5	5	5	20
	120	**30**	**30**	**30**	**30**	**120**

The only instrument used in gathering data for the study was a questionnaire on awareness that rat is a Lassa fever vector (QARLAFV) constructed by the researcher. This questionnaire was made up of two sections.

Section A: contained information on the respondents' personal data relevant to the study like name of village, sex and literacy. Section B: contained 20 structured items or questions meant to elicit information from the people on their level of awareness that rat/rodent which lives in and around homes is a vector of Lassa fever. The instrument was validated by two of the researcher's lecturers who are experts in test and measurement in the faculty of Education. Their comments were useful in the final production of the instrument. The instrument was pilot tested in a typical rural community in Ogbere, Ijebu-East Local Government, which was not part of the main study. Pilot testing of the instrument showed it to be fairly reliable with a cronbach alpha coefficient of 0.72.

A preliminary visit to the villages was made by the researcher in which permission to conduct a survey of this nature was sought and obtained from the head of the six villages. Further visit was made to demarcate the houses to be used for the study. When the targeted respondents were known, the researcher set out on a house-to-house interview which lasted for 5 weeks.

The researcher was careful to ensure that during the interview persons who are literate or illiterate, as the case may be, were not also interviewed as male or female.

Different persons were used altogether. Each questionnaires items was audibly read and explained to all the respondents, on a one-on-one basis, and specially interpreted in vernacular to those who did not understand English (which was the language of the questionnaire). In all cases, the responses were recorded by the researcher. The data obtained from the study were pooled and analyzed, using mainly the independent t-test statistics at 0.05 Level of significance.

Result and Interpretation

The results of the study are presented in tables 2 and 3 below reflecting the order in which the research hypothesis were raised.

Hypothesis one (Ho_1): There is no significant difference in the mean scores of literate and illiterate respondents in their level of awareness that rat is a vector of Lassa fever.

Table 2 below shows the analysis of data in respect of the first hypothesis and the decision arrived at.

Table 2: t-test of mean scores of Literate and Illiterate respondents

Variable	N	$\bar{X}$	S.D	DF	t.cal	t.cri	Decision
Literate	30	33.85	1.06				
Illiterate	30	32.07	1.07	142	0.33	1.98	Sig. at 0.05

Table 2 above reveals that the calculated values of t is less than the critical value at the degree of freedom of 142 and 0.05 significant level i.e. 0.33 < 1.98 at P=0.05. Hence the hypothesis that there is no significant difference in the mean scores of literate and illiterate respondents in their level of awareness that rat is a vector of Lassa fever is accepted.

Hypothesis Two ($H0_2$): There is no significant difference in the mean scores of male and female respondents in their level of awareness that rat is a vector of Lassa fever. Findings in respect of the second hypothesis are presented in table 3 below.

Table 3: t-test of mean scores of male and female respondents

Variable	N	$\bar{X}$	S.D	DF	t.cal	t.cri	Decision
Male	30	31.02	1.08				
Female	30	34.76	1.03	142	0.98	1.98	Sig. at 0.05

As evident in table 3, it is obvious that the calculated t-test value is less than the tabulated't' value at P=0.05 and degree of freedom of 142 i.e. 0.98< 1.98 at P=0.05 meaning that there is no difference in the level of

awareness that rat is a vector of Lassa fever between male and female inhabitants of rural areas in Ijebu-North Local Government.

Discussion and Recommendations

The major focus of this study was to determine the level of awareness that rat is a vector of Lassa fever by rural people of Ijebu-North Local Government. Arising from the findings of the study is a clear indication that literate and illiterate rural inhabitants in Nigeria do not aware that Lassa virus is being carried by rats. Although literate respondents showed level of awareness, the number is significantly low. This result may be due to poor infrastructural and communication facilities in rural areas as many of such areas lack electricity and most often have no access to electronic and mass media through which information about Lassa fever in Nigeria were disseminated. Hence, it is obvious that with basic literacy and infrastructural development, the rural people will be sufficiently aware of the general causes, prevention and control of the Lassa fever vector and Lassa fever itself, even without advanced knowledge of Biology or Health science.

As for the role of gender in creating awareness among rural people towards rat as a vector of Lassa fever, the findings of this study revealed that both male and female rural inhabitants showed low level of awareness that rat is a vector of Lassa fever, although, female respondents showed higher level of awareness than their male counterparts. This high level shown by women might be due to their regular visit to health centers, especially pregnant ones, on the ground of malaria attack or gynecological issues in which issues concerning Lassa fever might crop up.

Very firm conclusion cannot be drawn yet from the result of this study until studies in similar rural setting within and outside the state provide confirmatory data. Be that as it may, the results are indicative of the fact that a large number of rural people elsewhere in the state and even other rural communities in the country do not attach any health importance to a common rat/rodent, let alone associate it within the deadly killer disease (Lassa fever).

The implications of the findings in the context of a healthy and productive rural sector to the economic and social growth of the nation are very clear. Governments at the three tiers (Federal, State, and Local) must now make conscious effort aimed at opening up the rural areas to serious health enlightenment drives. This should be done in concert with village heads, churches, mosques, and other non-governmental organizations (NGOs). This will ensure that the entire people are actively enlightened against spreading of food items in places where rats can prey on them thus preventing the spread of Lassa virus.

People should avoid using cats to control rats because they will soon become nuisance due to their dropping and urine. Food items like grains, garri, yam powders, among others used at home should not be stored in cartons or bags, rather in plastic sealed containers or rodent proof containers. Also refuse and dustbins should be fitted with lids because rodents go to where food is easily available. All rat hideouts should also be blocked. Do not spread food where rats can have access to and, clean your can juice cover before mouthing or better use a straw instead.

The Federal Government programme on Universal Basic Education (UBE) should be implemented to the latter in all states of the nation so that future generations of Nigerians will acquire not just the basic literacy skills but also the right orientation and attitude to embrace modern health care without coercion.

Finally, the World Health Organization (WHO) and its specialized agencies should be commissioned to conduct a nation-wide longitudinal health studies (LHS) with a view to determine the precise 'medical geography' of each rural area in the country. This will assist government and other health care providers in diagnosing the various causes of morbidity and mortality among rural dwellers.

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Appendix 1. Characteristics of Lassa fever cases, Nigeria, 2005– 2008*

Locality (hospital)	Case no.	Date of admission	Age, y/sex	Symptoms	Treatment	Outcome	HCW	GP and L gene RT-PCR	IgM IFAT†	IgG IFAT†	Virus isolation	Lassa virus strain (GenBank accession nos.)‡
Abakaliki, Ebonyi State (EBSUTH)	1	2005 Feb 4	40/M	Fever	Antimicrobial drugs, antimalaria prophylaxis	Survived	Nurse	Neg§	1:160§	>1:80§	ND	–
2	2005 Feb 7	54/F	Fever, vomiting, diarrhea, respiratory distress, oliguria	Antimicrobial drugs, corticoid	Died Feb 13	Nurse/contact to case 1	ND	ND	ND	ND	–	
3	2005 Feb 21	35/F	Fever, severe weakness	NA	Survived	Nurse/contact to case 2	Pos Neg§	Neg 1:640§	Neg >1:5120§	Neg	Nig05-SE40 (GU481058, GU481059)	
4	2005 Feb 21	36/F	Fever, vomiting, nausea, spontaneous abortion, shock	Antimicrobial drugs, tracheotomy	Died Mar 1	Nurse/contact to case 2	Pos	Neg	Neg	Neg	Nig05-043 (GU481056, GU481057)	
5	2008 Jan 17	38/M	Fever, vomiting, diarrhea, abdominal tenderness, anuria, generalized seizure, unconsciousness	Antimicrobial drugs, antimalaria prophylaxis, dobutamine, dopamine, furosemide	Died Jan 23	Doctor	Pos	Neg	Neg	Neg	Nig08-03 (GU481066, GU481067)	
6	2008 Mar 5	38/M	Fever, vomiting, hiccups, bloody diarrhea, abdominal tenderness, generalized seizure, unconsciousness	Antimicrobial drugs, antimalaria prophylaxis, assisted ventilation	Died Mar 11	Doctor	Pos	1:20	1:20	Pos	Nig08-04 (GU481068, GU481069)	
Abuja, FCT State (NHA)	7	2008 Jan 2	37/M	Fever, vomiting, diarrhea, abdominal tenderness, confusion, unconsciousness	Antimicrobial drugs, ribavirin on day of death	Died Jan 7	No	Pos	1:20	1:20	Neg	Nig08-02 (GU481063 to GU481065)
Jos, Plateau State	8	2007 Dec	19/F	NA	NA	Died	NA	Pos	Neg	Neg	Neg	Nig07-05 (GU481060 to GU481062)
9	2008 Feb	30/M	NA	NA	Died	No	Pos	1:1250	1:80	Pos	Nig08-A18 (GU481070, GU481071)	
10	2008 Feb	28/F	NA	NA	Survived	No	Pos	1:80	1:80	Pos	Nig08-A19 (GU481072, GU481073)	

*HCW, health care worker; GP, glycoprotein; L, large; Ig, immunoglobulin; RT-PCR, reverse transcription PCR; IFAT immunofluorescent antibody test; EBSUTH, Ebonyi State University Teaching Hospital; pos, positive; neg, negative; ND, not done; NA, data not available; FCT, Federal Capital Territory; NHA, National Hospital Abuja.
†Titer of IFAT (cut-off 1:20).
‡Partial GP and L gene sequences were obtained by sequencing the fragments amplified by the diagnostic RT-PCRs. Additional nucleoprotein gene sequences were generated for Nig07-05 and Nig08-02, and strains isolated in cell culture were completely sequenced (D. Ehichioya, unpub. data).
§Convalescent-phase serum sample.

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