

Indiscriminate handling of rodents and some cultural practices: their possible role in the spread Lassa virus (LV) in Edo State, Nigeria

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Abstract

Background: The traditional healer/spiritualist is consulted for various services ranging from treatment of diseases to the procurement of charms/ placement of curses/ and or lifting. Speculations are rife that rodents which may include species of *Mastomys* are used by traditional doctors in Edo state, Nigeria for the preparation of a charm used to place a curse on another person. The rodent, *Mastomys natalensis* is known to cause a fatal viral haemorrhagic fever, Lassa fever and this disease is endemic this state. Sporadic outbreaks have been reported.

Aim: To explore the knowledge of study participants on rodents as vector of lassa fever virus and its use for the making of charms by traditional native doctors. Also to find out the perceived measures that will be effective in convincing all those who handle the rodent indiscriminately on the dangers inherent in the practice including contracting Lassa fever (LF) and spreading the Lassa virus (LV).

Design: A cross sectional study

Method: The study tool was a questionnaire designed to examine the knowledge about the rodent as the vector for the LV, the reason for the choice of rodents and its use for the preparation of a charm, why the curse is placed on individuals and measures perceived to be effective in the enlightenment of every one of the dangers of handling the rodent.

Result: Two hundred and forty-one volunteers participated in the study. One hundred and twenty-four were males and 117,

females aged between less than twenty and sixty years and above. Seventy-two (29.9%) were aware that the rodent is of utility in the preparation of a charm to place a curse and a significantly higher level of awareness was associated with lower levels of education ($P < 0.001$). Forty-six (63.9%) of those who were aware that the rodent is used to make a charm say it is common knowledge, 20 (27.8%) attested to the fact that they got to know from friends and 6 (8.3%) said they heard of it from neighbors. Some of the reasons volunteered to warrant the curse include jealousy, envy instinctive hatred etc. The rodent is said to be available on sale in some open markets in Benin City, Edo state in Southern Nigeria.

Conclusion: Indiscriminate handling of rodents which may include species of *Mastomys* raises substantial concern regarding potential risk of rodent-borne zoonoses particularly the spread of LV and; also negate control efforts against the spread of LF in Edo State.

Control programs designed carefully to effectively implement enlightenment campaign without transgressing the culture and customs of the people is advocated. This will have to be with the full cooperation and participation of relevant stakeholders.

Key words: rodents, hunting, charms, rodent-borne zoonosis,

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Introduction

Rodents of the genus *Mastomys* serve as reservoirs for the Lassa virus (LV), an arena virus that causes a potentially severe hemorrhagic disease, Lassa fever (LF)¹. Human infections with LV occur when there is contact with the secretions or excretions of the rodent. Arena viruses are emerging in the Americas and Africa and can cause hemorrhagic fever with case fatalities of up to fifteen percent².

In the 1970s, the rodent host of Lassa virus was classified as *Mastomys natalensis*.³ In Sierra Leone, epidemiological studies conducted on Lassa fever showed that *M. natalensis* constituted 50-60% of rodents captured in houses suggesting that houses are the most common locations for the transmission of Lassa virus⁴

In Edo state, Nigeria, it is speculated that species of rodents (with local name ukhain, okhan and asin in Edo, Esan and Yoruba dialects respectively) is used by alternate medicine practitioners including spiritualists to prepare charms which are used to place a curse of offensive body odor on another person.

We therefore conducted this study in Edo state, Nigeria, among volunteers in order to assess the knowledge/ source of information about the use of the rodent for the preparation of a charm and as the vector for the LV. The study also sought to find out measures the respondents perceived would be best to convince the people to desist from indiscriminate handling of rodents.

We believe that the data presented here will be useful in the planning of LF control program in Edo state Nigeria and possibly elsewhere.

Materials and methods

This cross sectional study was conducted in Benin-city, Edo state, Nigeria during the period May 2014 and April 2015. Market stalls in Benin City where traditional medicine items are sold were randomly selected. A

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consecutive sampling method was used to enroll all consenting market women who sell traditional medicine items, their suppliers and customers at the time of our visits were enrolled in the study. The study population was made up of Bini, Esan and Yoruba speaking people of Edo state.

The society in Benin City is patrilineal and based on hierarchies of clans and lineages. A substantial population is traditionalists and the traditional rulers and leaders are highly revered. The main Religion is Christianity but the ancestral gods are still worshipped by some of the people. Traditional doctors, healers and spiritualists play important roles in the community and are often consulted whenever there is a health, social or spiritual problem. Data were collected using a specially designed questionnaire meant for the study. The instrument included data on socio-demographic characteristics of respondents, sources of information about the rodent as vector for LV, and the choice of rodents as the ingredient for making charms, source(s) of supply to the retailers and the end users. Also data on the perceived measures for the prevention of the indiscriminate handling of rodents were collated.

Inclusion criteria

Volunteers who were market men and women, those who supply items for traditional medicines, buyers and those around the stalls during our visits.

The questionnaires were interviewer administered by trained research assistants. Answers/responses to questions were recorded in the appropriate sections of the questionnaires.

Respondents reported knowledge of rodents as vector for LV.

This outcome came from questions that asked for sources of information on rodents as vectors.

Information about how knowledge was acquired concerning the use of rodents in charm making was also provided by the respondents.

This outcome came from questions that asked how users knew about the use of rodents for making charms.

Respondents reported on how end-users got rodents.

This outcome came from questions that asked for sources of rodents to the end users.

Respondents reported on why the curse of repulsive body odour with a charm made from rodents placed on another person.

This outcome came from questions that asked for reasons for placing a curse made from rodents.

Respondents reported on the reason for the choice of the rodent as an ingredient for the charm.

This outcome came from the question that sought to

know the reason for the choice of rodents for making the charm to place a curse of body odor.

Respondents reported on the method to be used to enlighten members of the community to discontinue with the use of rodents for the making of charm.

This was the response to the question on the perceived method of enlightenment of traditional healers in order to convince the healers/spiritualists of the dangers of indiscriminate handling of the rodent.

Ethical Consideration

The study was conducted after obtaining ethical approval from the University of Benin Teaching Hospital (UBTH) Review Board. Participation in the study was voluntary after the interviewers explained the nature and purpose of the study to each respondent. The respondents were informed that the study aimed to provide additional information that will be useful in the control of LF in Edo state. Interviewees were assured of complete confidentiality and anonymity.

Data Analysis

Chi square contingency table analysis was used to carry out test of association between educational status and level of awareness, gender and level of awareness, and age group and level of awareness. The SPSS version 21.0 was used for analysis.

Result

Socio-demographic characteristics

Demographic characteristics of 241 respondents were summarized based on educational level and awareness/knowledge about the rodent.

Seventy-eight (32.4%) respondents had no formal education and were mostly aware (21.6%) of the use of the rodent for charm but were least aware (0.8%) that it is the vector for LV.

Sixty (24.9%) of the respondents had primary education and of this 12(5%) knew the rodent was the vector for LV.

Of the fifty-three (21.9%) respondents that had secondary education, 13(5.4%) were aware the rodent is a vector and 7(2.9%) said they were aware of its use in charm making. Thirty-six (14.9%) of the 50 respondents with tertiary education knew the rodent was a vector for LV (Table 1). Significantly higher level of awareness concerning the rodent as a vector for LV was associated with level of education ($P < 0.001$). Also a significantly higher level of awareness about the use of the rodent for charm was found to be associated with level of education ($P < 0.001$).

Table 1. Relationship between sex, age, educational status and awareness that rodent is vector of LV and its use for charm.

Variables	Aware Mastomys is vector of LV	Aware Mastomys is used for charm	No idea
SEX:			
Males (n=124)	19(15.3)	28(22.6)	77(62.1)
Females (n=117)	30(25.6)	48(41.0)	39(33.3)
$X^2 = 19.99$; Df= 2;	$P < 0.001$		
AGE GROUPS:			
≤ 20 (n=11)	1 (9.0)	5 (45.0)	5 (45.5)
21- 40 (n=82)	12(14.6)	32(39.0)	38(46.4)
41- 60 (n=70)	23(32.9)	18(25.7)	29(41.4)
>60 (n=78)	17(21.8)	17(21.8)	44(56.4)
$X^2 = 13.747$; Df= 6;	$P < 0.05$		
EDUCATIONAL STATUS:			
NON (n=78)	2 (2.6)	50(64.1)	26(33.3)
PRIMARY (N=60)	2 (3.5)	12(20.0)	46(76.7)
SECONDARY (N=53)	13(24.5)	7 (13.2)	33(62.3)
TERTIARY (N=50)	36(72.0)	3 (6.0)	11(22.0)
$X^2 = 149.9$; Df= 6;	$P < 0.001$		

The ages of the respondents ranged between <20 and >60 years. Majority (34.0%) of the respondents were aged between 20 and 40 years of age.

One hundred and seventeen (48.5%) respondents were females and 124(51.5%) males.

Table 2. Source of information on Rodent as vector for LV (n=53)

Text book	19(35.9)
From friends/relations	4(7.5)
Print Media	6(11.3)
Electronic media	24(45.3)

Information about the rodent as a vector for LV

Of the fifty three respondents who knew that the rodent was the vector for LV, twenty-four (45.3%) said they acquired their knowledge from radio/television, 19 (35.9%) from text books, 6(11.3%) from print media and the remaining 4(7.5%) respondents said they got their knowledge from friends/relations.

Information about the rodent in the use of charm making

Concerning information on the use of the rodent for

charms, 46 (63.9%) of the respondents said it was common knowledge, 20(27.8%) from friends while 6(8.3%) said they got to know from neighbors.

Information about the source of rodent to end-users

Of the eight respondents who were willing to disclose the source of the rodent to the users, 2(25%) said that people hunt and subsequently sell the rodents to market women while the remaining six (75%) respondents said that the rodent is available on sale in the open market. They however could not disclose how much a rodent sold for either on account of recall failure or for fear that they may be suspected of patronage of retailers of the rodent.

Information Reasons for placing the curse with a charm made with rodents

Seventy-two (29.9%) respondents who are aware of the use of the rodent for charm said the curse is to get even for reasons such jealousy, envy or instinctive hatred. They also gave reason for the choice of the rodent to be the exact smell intended to be put on the enemy.

Information on Perceived method of enlightenment

Thirty one percent of the respondents said that those who believe in the placement of a curse on individuals may be difficult to convince to stop the practice. Traditional doctors may not be willing to talk about anything pertaining to their practice; respondents therefore said it would require a lot persuasion to get them to admit to making charms meant to place a curse.

Discussion

This is a report of a study using questionnaire as study tool reporting the possible role of traditional practice and indiscriminate handling of rodent which poses the risk of the spread of LV in Edo state, Nigeria which has not been documented before. Rodents are significant reservoirs for several zoonosis, hunting and preparing rodents as food as well as for consumption could be important factor for zoonotic transmission⁵.

Our report of the hunting of rodents for sale and the making of charms in Benin City raises substantial concern regarding potential risk of rodent-borne zoonoses which supports earlier reports in Thailand where there is hunting of rodents for food and consumption⁶ and the hunting of peri-domestic domestic rodents and consumption of their meat which poses possible risk factors for rodent-to-human transmission of Lassa virus in the Republic of Guinea⁵; rodents are used for feasts, religious ceremonies and in exchange for certain activities in Thailand⁷.

Our finding demonstrates that though more males than females (124 vs. 117) volunteered to participate in the survey, females were more aware of the medical

importance of the rodent as well as its use for traditional charm. This implies that more males than females were ignorant of its medical and traditional importance as shown by the number that had no idea about the rodent (77 vs. 39).

Traditional doctors/spiritualists claim that they can cure all diseases⁸ and so are consulted first for various health and spiritual problems by those unaware that some of the claims are bogus because of cultural and traditional beliefs by the people. For example; in a documentation of treatment failure by a traditional healer in Zimbabwe, which was reported by Chain and Cotton⁹; a case of an infertile marriage due to pseudohermaphroditism in the husband was reported to have been cured. In order to avert social opprobrium the brother of the husband was arranged to secretly get sister-in-law conceived unknown to the husband. Disclosure of this secret according to the Zimbabwean tradition is punishable by death. It was made to appear like a successful treatment of infertility by the traditional healer.

Some of the respondents said that getting even in some of the communities at times may be by placing a curse on an enemy for reasons such as jealousy, envy, rivalry or instinctive hatred.

A female who plays hard to get may be charmed to exude offensive body odor by an aggrieved male suitor whose love advances have been spurned; the purpose of the charm would be that no other man ever desires her. Rivalry and/or competition in business could be a reason for the charm. A trader could use the charm on a rival to put off buyers and prevent them from patronizing a trader with an offensive body odor.

Thirty one percent of the respondents were aware that the rodent is used for a charm. This level of awareness about the use of the rodent for charm making supports claim that the rodent is indiscriminately handled by a cross section of the community particularly relevant communities in Edo state and possibly elsewhere in Nigeria. This highlights the importance of directing interventions at traditional doctors and those who patronize them.

In addition, our finding highlights the vulnerability of the female gender on the issues of indiscriminate handling of the rodent as more women than males (48 vs. 28) were aware of its use in charm making. Women as care providers are more likely to be the ones to go in search of healing/casting away spells or putting curses on people on behalf of family members.

Decisive measures should be put in place to dissuade the hunting and sale of the rodent through drama sketches in the electronic media.

The significant association between lower educational level and awareness about medical importance of the rodent underscores the importance of

education in the prevention of indiscriminate handling of rodents.

Target education on the mode of transmission of LF will improve knowledge and beliefs about the *Mastomys* rodent in the LF causation. We believe it would lead to desirable changes in the behavior of people especially with regards to their beliefs. More studies should be conducted in order to provide taxonomic identification of *Mastomys* rodents prevalent in Nigeria. An earlier study reported that *M. Kollamannspengeri* is present in Nigeria¹⁰ although most arena viruses have been associated with one specific reservoir¹¹, which is *M. natalensis*. More corroborating findings are desirable in Nigeria to provide the pattern of distribution of taxonomically defined reservoir hosts/vectors. This will shed more light on the epidemiology of Lassa fever in Nigeria. Some other epidemiological studies conducted in West Africa include the reproductive characteristics of *M. natalensis* and Lassa prevalence in Guinea¹² and molecular screening of various species of the genus *Mastomys* in Guinea and Cote'd Ivoire². The reservoir host of Lassa virus is the multimammate rat *Mastomys natalensis*. It was found infected for the first in Nigeria in 1972.¹³ The ecology of Lassa fever is dependent on the reservoir host which must be properly identified and classified in order to plan the agenda for the control of this important rodent borne hemorrhagic lethal disease. There are no studies to date reporting the hunting and sale of rodents for cultural purposes in Nigeria.

We recommend further studies on the association between rodent-borne infection including Lassa fever and the handling, including hunting and sale of rodents in Edo state.

The cooperation and participation of traditional doctors/spiritualists will be needed in order to effectively implement the enlightenment programs without transgressing the culture and custom of the people.

Limitations

Most of the people approached to participate in the study were not comfortable discussing cultural practices and beliefs. This presented logistical challenges.

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