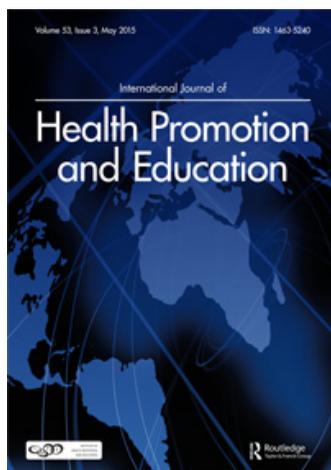


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Public awareness of Lassa fever in three rural communities of Nigeria

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Public awareness of Lassa fever in three rural communities of Nigeria

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Lassa fever is endemic in west Africa. Persons at greatest risk are those living in rural areas with poor sanitary conditions and overcrowding. Against this background, this study aimed at assessing public awareness of Lassa fever among residents of three rural communities in Edo State, Nigeria. A total of 380 persons resident in rural Okada, Ogbese and Utese communities of Edo State, Nigeria were enrolled for this study. Age range of participants was between 15 and 69 years. A structured questionnaire was administered to all volunteer subjects to obtain relevant information. Irrespective of community studied, a total of 28 (7.4%) participants reported to have heard of Lassa fever. Male gender was associated with awareness of Lassa fever in all communities surveyed. The television was the most popular source of Lassa fever awareness in all communities studied. Among participants who reported to have heard of Lassa fever, vehicles of transmission of disease mentioned included mosquito bites 9 (32.1%), dog bites 7 (25%) and eating of rat-contaminated food 2 (7.1%). Sleeping under mosquito bed nets and intake of herbal concoction were the principal mode of prevention of Lassa fever reported by respondents. A total of 15 (53.4%) and 16 (57.1%) of persons aware of Lassa fever had no idea of any vehicle of transmission and mode of prevention of the disease, respectively. Grave misconceptions on mode of transmission and prevention of Lassa fever were observed in all communities surveyed. Renewed effort at enlightening residents of rural communities on causes, modes of transmission and prevention of Lassa fever is advocated.

Keywords: Lassa fever; *Mastomys natalensis*; awareness; rural communities; Nigeria

Introduction

Lassa fever is an acute viral zoonotic illness endemic in west Africa. It was first isolated in 1969, from a missionary who was infected while working as a nurse at Jos Mission Hospital in Jos, Nigeria (Bond et al. 2013); ever since, outbreaks of the disease have been reported in several parts of Nigeria (Abdurahim 2002, Achinge, Kur, and Gyoh 2013). Lassa fever is endemic in Nigeria with the prevalence of antibodies to the virus being approximately 21% in the Nigerian population (Tomori et al. 1988). Lassa fever has been reported in more than 23 of the 36 states of Nigeria, with Edo State being one of the most affected states (Achinge, Kur, and Gyoh 2013). Lassa fever has also been noted in other west African countries including Liberia, Sierra Leone, Guinea and Mali (Ogbu et al. 2007). Every year, there are 300,000 estimated cases of illness due to Lassa virus in endemic areas with about 45,000 deaths recorded (Senior 2009).

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Lassa virus is transmitted through the droppings of the multimammate rat (*Mastomys natalensis*), which serves as the reservoir host to the Lassa virus. The rats breed frequently and are distributed widely throughout west, central and east Africa (Richmond and Baglolle 2003) and are predominately found in rural areas (McCormick 1987). Persons at greatest risk are those living in rural areas, especially areas with overcrowding and poor sanitation conditions (Ogbu et al. 2007). Importation of Lassa fever however, by travellers into non-endemic regions, has also been documented (Johnson and Monath 1990).

Early diagnosis is critical to effective management of disease. Lassa fever is known to presents with symptoms and signs indistinguishable from those of febrile illnesses such as malaria and other viral haemorrhagic fevers (Ogbu et al. 2007, Richmond and Baglolle 2003), which are prevalent in the tropics. Complete reliance on clinical diagnosis of disease consequently may be misleading. Diagnosis should be based on a combination of clinical manifestation, epidemiological data and results of laboratory findings (Ogbu et al. 2007). Sadly however, its diagnosis is often impeded in rural areas of developing countries where facilities to identify the virus are evidently lacking. There are no diagnostic centres for Lassa fever in our study areas and indeed the entire Ovia north-east Local Government Area of Edo State, Nigeria. Consequently, many people in this region may suffer undiagnosed cases of Lassa fever. This no doubt has great implication for the health and general wellbeing of the people as missed diagnosis of Lassa fever has been reported to increase the risk of transmitting infection to other members of the community at large (Achinge, Kur, and Gyoh 2013).

Accurate knowledge of mode of transmission and prevention of disease is pivotal to effective Lassa fever control. Data on awareness and knowledge of Lassa fever among the Nigerian people are scanty, years after the disease was first discovered in the country. Person-to-person transmission of Lassa virus and ingestion of *M. natalensis* faecal contaminated food products are major vehicles of contracting the disease. Reports indicate that Lassa fever is endemic in some rural communities of Edo State Nigeria (Eze et al. 2010). Although no outbreak of Lassa fever has been officially reported in Okada community and environs, inter-community migration of persons and farm produce in Edo state, may serve as a medium of disease spread from endemic areas to areas of low prevalence. Data on public awareness of Lassa fever in Nigeria is sparse. Against this background, this study was conducted to assess Lassa fever awareness level of residents of rural Okada, Ogbeses and Utese communities of Edo Stae, Nigeria.

Materials and methods

Study area

This study was conducted during the months of June to November 2012, in rural Ovia north-east Local Government area of Edo State. Communities surveyed included Okada, Ogbese and Utese. The local Government area has an estimated population of 155,344 persons (National Population Commission 2006). Okada is the headquarters of Ovia north-east Local Government Area. Igbinedion University is located in Okada community. Most of the residents of the communities under study are farmers and traders.

Study population

A total of 380 persons resident in rural communities under focus were enrolled for this study. All participants were between the ages of 15 and 69 years. A structured questionnaire was administered to all volunteer subjects. Students and staff of the

Igbinedion University, and the Igbinedion University Teaching Hospital Okada were exempted from this study. Informed consent was obtained from all participants after the purpose of the study was carefully explained to them. In the case of persons less than 18 years, consent was obtained from their parents/guardians. This was sometimes done in the native local dialect to aid understanding. The study was approved by the ethical committee of Ovia north-east Local Government Area Council of Edo State, Nigeria.

Sample size determination

Sample size determination was done using the formula ($N = Z^2 \times P(1 - P)/D^2$) obtained by Naing and his colleagues (Naing et al. 2006).

Lassa fever awareness level of 36% set from a previous Nigerian study (Asogun et al. 2010) was used for this estimation.

A sample size of 380 persons was obtained.

Statistical analysis

The data obtained were analyzed using Chi square (χ^2) test and odd ratio analysis using the statistical software INSTANT[®] (Graphpad software Inc., La Jolla, CA, USA). An association was established between two variables when an OR value ≥ 1.00 was obtained. Statistical significance was set at < 0.05 .

Results

A total of 517 persons were approached for this study, but only 380 agreed to participate representing a response rate of 73.5%. Of the 380 participants recruited 28 (7.4%) reported to have heard of Lassa fever. Respondents in Okada community were significantly more likely ($p = 0.010$) to be aware of Lassa fever than respondents from other two communities. An association was found to exist between awareness of Lassa fever and male gender in all communities studied. Within each community surveyed, age did not significantly affect awareness of Lassa fever ($p > 0.05$) (Table 1). The television was the most popular source of Lassa fever awareness in all communities surveyed (Table 2).

Table 1. Awareness of Lassa fever among respondents.

Characteristics	Okada community ($n_1 = 158$)		Ogbese community ($n_2 = 110$)		Utese community ($n_3 = 112$)		P-value
	N	No aware (%)	N	No aware (%)	N	No aware (%)	
Heard of Lassa Fever		19 (12.0)		6 (5.5)		3 (2.6)	0.01
Gender							
Male	67	11 (16.4)	36	6 (16.7)	31	3 (9.7)	0.645
Female	91	8 (8.8)	74	0 (0.0)	81	0 (0.0)	0.001
Age (years)							
15–27	73	5 (6.8)	45	2 (4.4)	41	2 (4.9)	0.611
28–40	55	11 (20.0)	37	3 (8.1)	45	1 (2.2)	0.004
41–53	23	3 (13.0)	15	1 (6.6)	22	0 (0.0)	0.079
≥ 54	7	0 (0.0)	13	0 (0.0)	4	0 (0.0)	–

Notes: N – number of respondents. Okada community (male vs. female): OR = 2.038; 95% CI 0.7710, 5.387; $P = 0.215$. Ogbese community (male vs. female): OR = 31.754; 95% CI = 1.734, 581.65; $P = 0.001$. Utese community (male vs. female): OR = 20.018; 95% CI = 1.002, 398.85; $P = 0.019$. Okada community (age): $P = 0.506$; Ogbese community (age): $P = 0.745$ Utese community (age): $P = 0.232$.

Table 2. Source of Lassa fever awareness among respondents.

Characteristics	Okada community ($n_1 = 19$)	Ogbese community ($n_2 = 6$)	Utese community ($n_3 = 3$)	Total ($n = 28$) (%)
	No aware (%)	No aware (%)	No aware (%)	
Source of Knowledge				
Television	15 (78.9)	6 (100.0)	3 (100.0)	24 (85.7)
Hospital	3 (15.8)	0 (0.0)	0 (0.0)	3 (10.7)
Friends	2(10.5)	0 (0.0)	0 (0.0)	2 (7.1)

Among respondents who had heard of Lassa fever, vehicles of transmission of disease reported included mosquito bites 9 (32.1%), dog bites 7 (25%) and eating of rat-contaminated food 2 (7.1%). Sleeping under mosquito bed nets and intake of herbal concoctions were the principal mode of prevention of Lassa fever reported by respondents aware of the disease. A total of 15 (53.4%) and 16 (57.1%) of persons aware of Lassa fever had no idea of any vehicle of transmission and mode of prevention of the disease, respectively (Table 3).

Discussion

Lassa fever is associated with increased mortality and morbidity. Persons at greatest risk are those living in rural areas, with very poor sanitation conditions and overcrowding (Ogbu et al. 2007). Inadequate and incorrect information regarding vehicles of transmission and mode of prevention of a disease can promote its spread among any

Table 3. Knowledge of reservoir host, mode of spread, and prevention of Lassa fever among respondents.

Characteristics	Okada community ($n_1 = 19$)	Ogbese community ($n_2 = 6$)	Utese community ($n_3 = 3$)	Total ($n = 28$) (%)
	No aware (%)	No aware (%)	No aware (%)	
Reservoir Host				
Rat	2 (10.5)	0 (0.0)	0 (0.0)	2 (7.1)
Mosquitoes	12 (63.2)	5 (83.3)	2 (66.6)	19 (67.8)
Dog	6 (31.5)	1 (16.7)	1 (33.3)	8 (20.7)
Don't Know	2 (10.5)	0 (0.0)	0 (0.0)	2 (7.1)
Mode of Spread				
Eating of rodent-contaminated food	2 (10.5)	0 (0.0)	0 (0.0)	2 (7.1)
Mosquito bites	5 (26.3)	3 (50.0)	1 (33.3)	9 (32.1)
Dog bites	3 (15.8)	0 (0.0)	0 (0.0)	3 (10.7)
Had no idea	10 (52.6)	3 (50.0)	2 (66.7)	15 (53.4)
Mode of prevention				
Keeping of foodstuff covered	2 (10.5)	0 (0.0)	0 (0.0)	2 (7.1)
Sleeping under mosquito nets	3 (15.8)	2 (33.3)	0 (0.0)	5 (17.8)
Drinking of herbal concoction	2 (10.5)	2 (33.3)	1 (33.3)	5 (17.8)
Had no idea	12 (63.2)	2 (33.3)	2 (66.7)	16 (57.1)

people. Against this background, this study aimed at assessing the level of Lassa fever awareness among residents of three rural communities of Edo State, Nigeria.

Irrespective of community studied, a total of 28 (7.4%) of all 380 participants enrolled reported to have heard of Lassa fever. This is lower than 36% recorded in another Nigerian study (Asogun et al. 2010). The study by Asogun and his colleagues (Asogun et al. 2010) was conducted in a community close to the only Lassa fever diagnostic centre (The Irrua Specialist Teaching Hospital, Irrua Edo State) in mid-western Nigeria. It is also important to note that the study by Asogun et al. (2010) was also conducted in a community previously reported to be ravaged by Lassa fever in Nigeria (Eze et al. 2010) in contrast to our study area where no formal report of Lassa fever has been documented probably due to poor surveillance. This may account for the difference in level of awareness of Lassa fever in both studies. Massive inter-border traffic of persons has led to spread of Lassa fever from endemic to non-endemic regions of Sub-Saharan Africa (Ogbu et al. 2007). Ignorance of the existence of a disease has the capacity to fuel its spread. In this study, less than 1 in every 10 persons claimed to be aware of Lassa fever. Such poor level of public awareness of Lassa fever may promote the spread of the disease in any community where it exists.

Report from a previous Nigerian study revealed that about 5.9% of members of the public that had contact with Lassa fever-infected patients were diagnosed of the disease in Nigeria (Eze et al. 2010). Activities such as inter-communal trade, which is common in rural areas of Nigeria, may promote the contact of Lassa fever-infected persons with unsuspecting traders who may then serve as vehicles of transportation of the disease to their respective communities. Exposure to Lassa virus may occur through agricultural practices and mining (Abdurahim 2002). Inhabitants of Okada community and environs are largely farmers, and may therefore engage in practices that have the capacity to dislodge Lassa virus carriers (*M. natalensis*) from their natural habitat into human settlements, thereby constituting a health hazard to residents of the community. This underlines the need for vigorous Lassa fever health education program among the people. Okada community plays host to the Igbinedion University, Nigeria's premier private University. The Igbinedion University Teaching Hospital and the administrative seat of the Ovia north-east Local Government Area are also located in Okada community. Participants in Okada community are therefore much more likely to engage in formal and/or informal interaction with the academic community and other medical personnel at the hospital than those in much more distant Ogbese and Utese communities. This may be responsible for the finding of greater Lassa fever awareness observed among Okada community residents.

The finding that males were significantly more aware of Lassa fever than females in Ogbese and Utese communities may be connected with the fact that most rural women, especially in Sub-Saharan Africa have limited financial and cultural autonomy, which represents a barrier to access to health information. Awareness of Lassa fever did not significantly differ with respect to age in all communities surveyed. In all communities, the television was reported as the most popular source of Lassa fever awareness. Indeed among residents of Ogbese and Utese communities, it was the only source of knowledge of the disease.

Only 2 (7.1%) of participants aware of the disease identified rats as reservoir host for the virus. This is in contrast to 51% who identified rats as source of Lassa fever infection in a previous Nigerian study (Asogun et al. 2010). Over half 19 (67.8%) of the 28 persons aware of Lassa fever reported mosquitoes as reservoir host for Lassa virus. Such grave misconception as regards carrier agent of Lassa virus seems to suggest that majority of

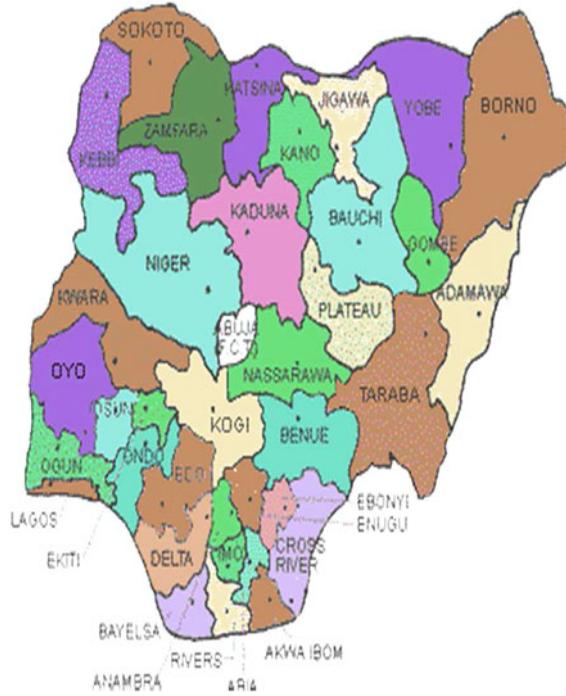


Figure 1. Showing States in Nigeria.

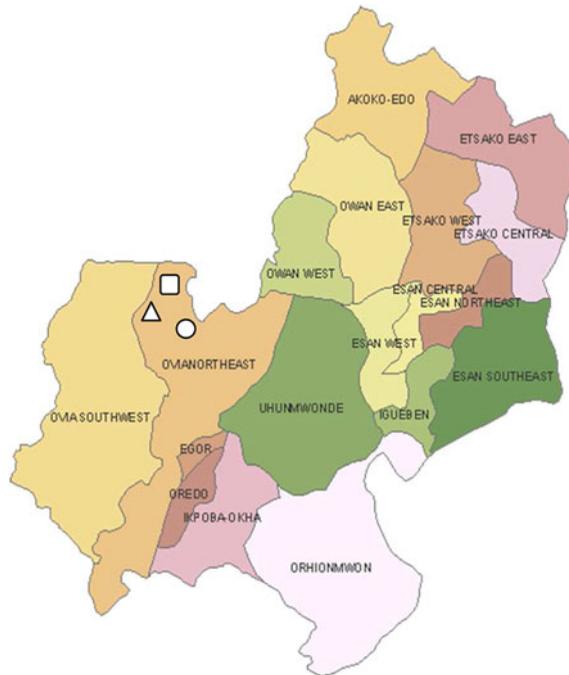


Figure 2. Showing the 18 Local Government Areas in Edo State. Key: Δ Okada Community; \square – Ogbese Community; \circ – Utese Community.

participants, who claimed to be aware of Lassa fever in this study, may indeed be completely ignorant of the disease and may have confused malaria fever for Lassa fever in their minds when responding to the questionnaire. This suspicion was further fuelled by the finding that 9 (64.3%) persons of the 14 participants who attempted to give a mode of spread of disease reported mosquito bites as a vehicle for transmission. Again participants aware of Lassa fever who reported use of mosquito nets and herbal concoction as preventive tools for Lassa fever were in the highest proportion. Although the television was reported as the most popular source of Lassa fever awareness, its impact on general knowledge of Lassa fever was poor judging from responses from participants of this study. Another study conducted in rural Nigeria on effectiveness of communicating HIV/AIDS control measures through the television showed very little improvement in pre- and post knowledge of HIV/AIDS among study participants (Odoemelam and Nwachukwu 2011). Television-based information dissemination of health issues in Nigeria is often done in English language. Most persons in communities under study are peasant farmers and may not understand English language properly. This may result in impaired understanding of general knowledge of mode of spread and prevention of Lassa fever passed through such channel as the television (Figures 1 and 2)

Conclusions

In all communities surveyed, awareness of Lassa fever was poor, as was knowledge of mode of transmission and prevention of disease. Inadequate and incorrect information regarding vehicles of transmission and mode of prevention of a disease can promote its spread among any people. There is therefore urgent need for increased intervention effort by relevant agencies at educating rural dwellers on causes, mode of transmission and prevention of Lassa fever in Nigeria, with emphasis on the use of local dialect to facilitate understanding.

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Conflict of interest

Authors have no conflict of interest to declare.

Notes

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