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Knowledge, Attitude, and Practice towards Lymphatic Filariasis among Inhabitants of an Endemic Town in Oyo State, Nigeria.

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Abstract

Background

The burden of lymphatic filariasis popularly called Ina orun in southwest Nigeria is of serious concern and it calls for urgent attention. The study aimed at assessing the knowledge, attitude and practice of inhabitants of two communities endemic with lymphatic filariasis in Ibadan South West Local Government Area of Oyo State, Nigeria.

Methods

A cross-sectional study was carried out among 243 respondents aged between 18-64 years using a semi-structured questionnaire. Knowledge on Lymphatic Filariasis was computed and categorized as poor or good. Odds ratio was generated from a binary logistics regression model.

Results

Mean age of respondents was 35.0± 8.5 years and 124 (51.0%) reported ever hearing about lymphatic filariasis. Majority, 157 (64.6%) had an overall poor knowledge of the disease. About half 123 (50.6%) of the participants did not know the symptoms and prevention practices. Up to 208 (85.6%) of the respondents were not aware of the mass drug administration program in the study area while 89 (36.6%) did not know the role of mass drug administration in preventing and controlling lymphatic filariasis. Respondents' gender (OR: 3.75, 95 CI: 2.13-6.58), education (OR: 0.09, 95 CI: 0.04-0.22) and occupation (OR: 62.57 95 CI: 18.4-212.75) were found to be significantly associated with good knowledge on lymphatic filariasis.

Conclusion

These results indicate poor community knowledge of lymphatic filariasis, inadequate prevention practices, and inadequate awareness of available programmatic efforts that the population can benefit from to tackle continuing transmission of lymphatic filariasis. Therefore, increased sensitization on lymphatic filariasis are necessary and urgent.

Keywords*: Lymphatic filariasis, knowledge, practice, Oyo*

Introduction

Lymphatic filariasis (LF), commonly called 'elephantiasis' is one of the most debilitating Neglected Tropical Diseases (NTDs). It is a filarial infection caused by the nematode worms *Wuchereria bancrofti*, *Brugia malayi* and *Brugia timori*. The disease is transmitted to humans through the bite of infected mosquito species of the genera *aedes, anopheles, culex,* and *mansoni.*[1] Nigeria has the highest number of people at risk of the infection globally followed by the Democratic Republic of Congo, Tanzania, Ethiopia and Kenya.[2] After malaria, LF ranks second in the list of vector-borne parasitic diseases and is recognized as the second leading cause of permanent disability.[3] Nigeria ranks third in the list of countries endemic with LF in the world with an estimated 22 million cases and 80 million people at risk of the disease.[4] Acute Symptoms of LF include fever presenting as recurring pain attacks and vomiting to more chronic symptoms such as lymphodema that could progress to gross enlargement of the limbs (popularly called elephantiasis) and chronic swellings of the scrotum otherwise called hydrocele.[5]

In year 2000, the World Health Organization (WHO) launched the Global Program to Eliminate Lymphatic Filariasis (GPELF) with the aim to interrupt transmission of LF by 2020. To achieve this elimination goal, WHO recommends that a minimum of 65% population coverage should be targeted for annual Mass Drug Administration (MDA).[6] In Nigeria, a study carried out in Ilorin, Kwara State showed that 82% of the study participants were unaware of LF and the actual cause of the infection. The respondents of the survey reported a fair understanding of LF prevention and management.[7] Another study done in Kano State, Nigeria reported poor knowledge of LF symptoms and transmission and only 12% of the respondents knew that mosquito can spread LF.[8]

Assessing the knowledge, attitude and practices of citizens in endemic communities concerning the disease and its elimination is important to evaluate the control effort being carried out and provide information on the potential risks that these communities remain exposed to. More so, data on awareness and response of endemic communities is useful for programming to reduce vector borne disease burden, as well as help in developing and implementing effective and sustainable control programs for the disease. In addition, recognizing a community's participation in tackling the disease is very critical to the success of any elimination program. Therefore, this study aimed to assess the knowledge, attitude and practice of the community residents about the causes, transmission, prevention and control practices of LF.

Methodology

Study design, study settings and study population

This cross-sectional study was carried out in Ibadan South West Local Government Area (LGA) of Oyo State, Nigeria. The LGA is located in Ibadan metropolis and is one of the 33 LGAs in Oyo State. The LGA has an estimated population of 190,672 inhabitants.[9] The two study communities-Foko and Oritamerin are located in the sub-urban area of Ibadan city with the areas being densely populated. The entire area is well drained by seasonal small and large rivers. The rivers include Ogunpa, Kudeti, Ona river and their tributaries. The climatic condition of the area is defined by wet and dry periods**.** Most rains fall from March to October. Average annual rainfall over the area is about 2100 mm, which shows marked monthly variation, the highest being recorded in July and September. Temperatures (minimum and

maximum) are generally high throughout the year. Average temperature in the area is 27ºC.[10] The majority of the inhabitants work as farmers and traders while artisans in occupations such as hairdressing, garment making and plumbing also form a significant proportion. Lymphatic filariasis is co-endemic with onchocerciasis in the LGA. The study population consisted of all adult residents of Ibadan South West LGA. Inclusion criteria for the study included males and females aged 18 years and above who had been resident in the study communities for at least one year, and gave consent to participate in the study.

Sample size determination and sampling technique

The minimum sample size estimated was 243 using the formula $n = Z^2p(1-p)/e^2$ where n = minimum sample size, Z = 1.96, standard normal variate at 5% type 1 error, p = 21% i.e. proportion of population with good knowledge based on a previous study,[11] e = 0.05, absolute error or precision).[12] A multistage sampling technique was used to select the participants. First, two wards were purposively selected out of the twelve wards in the LGA because of established cases of the disease in the wards. Thereafter, one community was selected from each of the two wards. Finally, five streets were selected randomly from each community. A random point was selected from each street from where eight consecutive households were selected and all adults who met the inclusion criteria in the households selected were administered the questionnaire.

Data collection instrument and data collection

A pre-tested semi-structured questionnaire was developed and deployed for data collection in the study areas. The questionnaire was translated from English into the local language Yoruba for ease of administration. Information collected included: socio-demographic characteristics, knowledge about LF including causes, signs and symptoms, mode of transmission, prevention and management of LF, respondents attitude and practices towards LF. Data collection was done by three trained interviewers who administered the questionnaire electronically using Kobo collect application on android devices.

Data analysis

Data was exported from Kobo collect into Statistical product and service solution version 20 cleaned and analyzed. The knowledge section consisted of 32 items relating to causes of LF, mode of transmission, prevention, and knowledge of control program through MDA. Participants' responses were marked as correct or incorrect and summed into a composite knowledge score. The mean knowledge score for the study population '17' was used as cut-off point. Respondents with scores less than 17 were classified as having poor knowledge, while respondents whose scores were ≥ 17 were classified as having good knowledge. All results are presented as descriptive and inferential statistics using frequency, percentages and logistic regression.

Respondents' occupation was classified as: Professionals; doctor, lawyer, accountant and lecturer. Highly skilled; nurse, teacher and school of technology graduates. Skilled; tailor, beautician, plumber, hairdresser, carpenter, electrician and all artisans. Semi-skilled; farmer, fishermen and miner. Unskilled; laborer, trader, shopkeeper, hawker and vendor.

Ethical consideration

All research procedures followed were in accordance with the approved standards of the relevant Research Ethics Committee on human research and with the Helsinki Declaration of 1975, as revised in 2000. Ethical clearance was obtained from the Research Ethics Review Committee of the

Oyo State Ministry of Health with registration number AD 13/479/4436[A]. Permission was obtained from the authorities of the LGA. Survey started with the informed consent being read and explained to each participant with the option of consenting or not consenting to participate in the survey. Those who consented to participate were those who proceeded with the study. All information obtained from the respondents was kept confidential.

Results

Sociodemographic characteristics of respondents

The mean age of respondents was 35.0 ± 8.5 years with 99 (40.7%) of them being in the 30-39 years age bracket. About half , 123 (50.6%) of the respondents were males. Most of the respondents were in a marriage relationship/cohabiting, 146 (60.1%), while 75 (30.9%) were single. Less than half of the respondents were in skilled occupation, 105 (43.2%) and 80 (32.9%) were in unskilled occupations. Some of the respondents 97 (39.9%) had completed a secondary education, 42 (17.3%) had a tertiary education and 11 (4.5%) had no formal education. About half of the respondents were Christians 121 (49.8%) and 101 (41.6%) were Muslim. Majority of the respondents (60.1%) had resided in the study communities for more than ten years. (Table 1).

Knowledge of lymphatic filariasis among respondents

Majority of participants had an overall poor knowledge of LF, 157 (64.6%), with slightly above one-third showing good knowledge of LF, 86 (35.4%). Only 124 (51%) of the study respondents had heard about the disease. Regarding respondents' knowledge on the symptoms of LF, only about one-third, 81 (33.3%) knew that LF may not show any sign, about a third of the respondents correctly associated the disease with elephantiasis, 82 (33.7%) and hydrocele 73 (30.0%) and about half, 123 (50.6%) of the study participants did not know any symptom of LF. (Table 2).

Sixty four (26.3%) of respondents knew that filarial worm results from mosquito bites. Meanwhile, reasons like dirty environment, 116 (47.7%) and eating contaminated food, 66 (27.2%) were wrongly given as the cause of LF, with up to 103 (42.4%) being unaware of what the cause of LF was. Most of the respondents did not know whether LF is communicable or not, 182 (74.9%). Less than one-third 66 (27.2%) of the respondents knew that mosquitoes play a major role in the transmission of the disease and 102 (42.0%) did not know the mode of transmission of LF.

Concerning LF prevention, about one-third 81 (33.2%) of the participants knew that LF could be prevented by avoiding mosquito bites, with 89 (36.6%) reporting that medicines for LF would help to control LF. Other reported measures for prevention include keeping the environment clean, 122 (50.2%), wearing long clothing, 48 (19.8%), and using bed nets or insecticide, 106 (43.6%). Most of the respondents did not know about the MDA program, 208 (85.6%) for LF control in the community. Over half of the respondents mentioned that everyone in the community should take medicine during MDA 144 (59.3%) even though almost one-third did not know who should take medicine during MDA 77 (31.7%). (Table 2).

Attitude towards lymphatic filariasis and its elimination

Most of the respondents reported that they would be ashamed, 130 (53.5%) about the disease or sad/worried, 109 (44.9%) if they or their relation became sick from LF. Majority (69.1%) of the respondents

thought the disease needs treatment and treatment options reported included use of both modern and traditional medicines, 182 (74.9%) and use of modern medicines only, 48 (19.8%). (Table 3)

Practice towards lymphatic filariasis and its elimination

Only 20 (8.4%) respondents took medicine at the last round of MDA for LF as 157 (70.4%) did not know about the MDA program in the community. Other reasons given for not taking medicine included: low risk perception of LF, 16 (17.9%) and use of other precautions, 16 (7.1%). Activities undertaken by respondents to prevent LF included: avoiding mosquito bites, 107 (44%) and keeping clean environment, 58 (23.9%). About 40 (16.0%) of the study participants did not do anything to prevent LF. Even though, only a few of the study respondents,15 (6.2%), reported being affected by the disease, less than half 6 (2.5%) of this minority group actually take treatment from health facilities as the majority 9 (3.7%) visit traditional homes for treatment. (Table 4).

Predictors of good lymphatic filariasis knowledge

Males were 4 times more likely to have good knowledge on LF than the females (OR = 3.75, 95% CI: 2.13-6.58, $P = 0.001$). Respondents'age was not found to significantly affect their LF knowledge ($P>0.05$) but respondents' occupation was found to have a statistically significant effect on LF knowledge. Respondents in highly skilled occupations were 56 times more likely have a good LF knowledge (OR = 56.31 95% CI: 16.47-192.59, $P = 0.001$), those in skilled occupations were 5 times more likely to have a good LF score (OR = 4.99, 95% CI: 2.08-12.00, $P = 0.001$), and those in semi-skilled occupation had a 15 times higher odds of good LF knowledge (OR = 14.90, 95% CI: 4.32-51.41, $P=0.001$) when compared to those in unskilled occupations. Respondent's level of education was also found to significantly affect their LF knowledge. Those who had no formal education were 0.35 times less likely to have a good knowledge on LF, those with primary education were 0.035 less likely to have good LF knowledge ($P = 0.001$) when compared with those with a tertiary education in the study population (Table 5).

Table 1: Socio-demographic characteristics of respondents

Variable	Frequency n = 243	%
Age group (years)		
20-29	84	34.6
30-39	99	40.7
40-49	38	15.6
50-59	22	9.1
Sex		
Males	123	50.6
Females	120	49.4
Marital status		
Single	75	30.9
Married/ Cohabiting	146	60.1
Divorced, separated /widowed	20	8.2
No Response	2	0.8
Occupation		
Professionals/Highly Skilled	35	14.4
Skilled	17	7.0
Semi-skilled	105	43.2
Unskilled	80	32.9
Unemployed	6	2.4
Education		
No formal education	11	4.5
Primary	93	38.3
Secondary	97	39.9
Tertiary	42	17.3

Table 2: Knowledge of lymphatic filariasis among respondents

Variables	Frequency	%
Overall Knowledge		
Poor	157	64.6
Good	86	35.4
Specific knowledge variables	**Yes (%)**	**No (%)**
Heard about LF	124 (51)	119 (49.0)
Knowledge related to symptoms of LF		
No signs	81 (33.3)	162 (89.7)
Elephantiasis	82 (33.7)	161 (66.3)
Scrotal swelling (Hydrocele)	73 (30.0)	170 (70.0)
Swollen breast	80 (32.9)	163 (67.1)
Do not know	123 (50.6)	120 (49.4)
Knowledge related to causes of LF		
Filarial worms in mosquito bite	64 (26.3)	179 (73.7)
Eating contaminated food	66 (27.2)	177 (72.8)
Sexual intercourse	18 (7.4)	225 (92.6)
Do not know	103 (42.4)	140 (57.6)
Knowledge related to mode of transmission		
Don't know if LF is communicable	182 (74.9)	61 (25.1)
Mosquito bite play a major role	66 (27.2)	177(72.8)
Do not know	102 (42.0)	141 (58.0)
Knowledge related to LF prevention and control		
Avoiding mosquito bites by using bed nets/insecticides	81 (33.2)	162 (66.8)
Taking drugs during MDA	89(36.6)	154 (63.4)
Do not know	103 (42.4)	140 (57.6)

Table 3: Respondents' attitude towards lymphatic filariasis

Variables	Frequency	%
Sick/ relation sick from LF		
Yes	15	6.2
No	159	65.4
No Response	69	28.4
Feeling if sick/ family member is sick from LF		
Sad/worried	109	44.9
Ashamed	130	53.5
Not bothered	4	1.6
At risk of developing LF		
Yes	57	23.5
No	186	76.5
LF needs treatment		
Yes	168	69.1
No	8	3.3
Don't know	67	27.6
Treatment		
Modern medicine only	48	19.8
Traditional medicine only	13	5.3
Both traditional and modern medicines	182	74.9

Table 4: Respondents' practice towards LF prevention and control

Variables	Frequency	%
Received medicine at last MDA round		
Yes	20	8.4
No	223	91.8
Why medicine was not received		
No knowledge about MDA	157	70.4
Low risk perception of disease	40	17.9
Use of other precautions	16	7.1
No Reason	10	4.5
Actions taken to prevent LF		
Avoiding mosquito bite	107	44.0
Keeping clean environment	58	23.9
Nothing	40	16.5
Place of treatment		
Traditional healers' home	9	6.7

Table 5: Predictors of good lymphatic filariasis knowledge among respondents

Variable		P	Odds ratio (OR)	95%CI
Age group	20-29	0.769	1.16	0.44-3.03
	30-39	0.193	0.53	0.20-1.39
	40-49	0.197	0.48	0.15-1.47
	50-59 (reference)			
Gender	Male	0.001	3.75	2.13-6.58
	Female (reference)			
Occupation	Highly skilled	0.001	62.57	18.40-212.5
	Skilled	0.001	4.99	2.08-12.00
	Semi-skilled	0.001	14.90	4.32-51.41
	Unskilled (reference)			
Education	No formal education	0.162	0.35	0.08-1.53
	Primary	0.001	0.04	0.01-0.09
	Secondary	0.001	0.09	0.04-0.22
	Tertiary (reference)			

Discussion

This study shows that although the communities in the study area are endemic for LF, majority of the population are unaware of the disease signifying that information and awareness creation on the disease remain very low in these communities. Awareness creation would allow the population to have specific knowledge on the causative agent and the routes of transmission of the disease. This result is similar to findings from studies in other endemic areas in Ghana,[13] Tanzania,[14] and Thailand[15] where low awareness of the disease were also reported. Furthermore, this study found that the population lacked adequate knowledge of the causative agent of LF. For instance, respondents attributed the cause of LF to numerous reasons unrelated to the cause of the disease such as eating contaminated food and sexual intercourse, rather than the filarial worms in mosquito bites. Our findings on misconception about causes of LF corroborate findings from a previous study among peasant farmers in Benue State, Nigeria where majority of the study participants wrongly reported causes of LF as lack of personal hygiene, walking long distances and stepping on charms.[16]

Our findings also show that majority of the respondents did not know that LF is a communicable disease, which suggests that precautionary measures may not be taken against the disease by many community members thereby increasing the risk of transmission. Similarly, a study among urban dwellers in India also reported lack of knowledge of filariasis as a communicable disease. [17] The role of mosquitoes in the transmission of the disease is not well understood; less than one-third knew that LF is transmitted by mosquito bites. Lack of knowledge of the transmission agent for LF can pose a challenge to combating or implementing effective vector control measures. Inadequate knowledge on simple preventive measures such as use of insecticide treated nets/ insecticide to prevent mosquito bites and taking of medicine during the MDA program put the community at increased risk of the disease. About one third of the respondents knew about the MDA to prevent LF while over 40% did not know LF prevention measures. However, these findings are contrary to those of a study in Plateau

State, Nigeria where the majority reported that MDA and vector control can be used to prevent LF.[3] If adequate knowledge of prevention is lacking, then control efforts targeted at the disease will be ineffective.[18] Unfortunately, the perception of being at risk of the disease amongst the sample population was quite poor. This low level of perceived risk may be due to the inadequate knowledge of the disease's mode of transmission in the study area. This finding is similar to results from a study among rural dwellers in Plateau State[3] and Taraba State, Nigeria [19] where about half of study participants did not feel that they were at risk of being infected with LF. This study showed that many of the respondents did not receive medicine during the last MDA mainly because of lack of knowledge of the MDA program. This is however in contrast to a study carried out in Telangana State, India[17] and Plateau State, Nigeria[3] where the majority of the respondents consumed diethylcarbamazine (DEC) tablets during MDA because majority knew about MDA in their community.

Our study found a significant association between respondents' gender and knowledge on LF with males more likely to have a good knowledge on LF than females. This could possibly be due to the fact that males have higher rates of infection [20] with LF and may be more likely to be informed about the disease than the females. Although other studies in Taraba State, Nigeria [19] Kano State, Nigeria[8] and Malaysia [21] did not find a correlation between respondents' gender and knowledge of LF.

Participants with low level of education had a lower likelihood of having a good knowledge on LF when compared to those with a tertiary education. This may be because more years of formal education is generally associated with better health knowledge. Our results are similar to findings from a study in the Philippines where possessing a high level of formal education was found to be associated with correct knowledge of LF [22] but in contrast to studies in Taraba State Nigeria,[19] Kogi State, Nigeria,[7] and Malaysia [21] where no correlation was found between respondents' level of education and knowledge of LF. Respondents in semi skilled occupations which included farmers had higher odds of good LF knowledge. This is similar to findings from studies in rural communities of Ogun State, Nigeria[23] and India[24] where farmers were reported to be at increased risk of LF due to greater exposure of their lower extremity to mosquito vectors.

Although Nigeria ranks third in the list of LF endemic countries in the world, there seems to be little research on LF compared to other NTDs in Nigeria especially in the south-western part of the country. The need for public health authorities to heighten the level of health awareness and education concerning the disease especially in endemic communities is paramount through stressing the effect of the disease such as permanent disability and vast economic loss incurred when patients are no longer able to make a living and support their families. The government and other agencies have an enormous task to make the MDA programs more effective. Endemic communities should be targeted but vulnerable communities should not also be left out. The need for adequate health campaigns on the disease and the effectiveness of the MDA program to control the disease should be emphasized before embarking on the MDA programs.

Conclusion

The study has shown that knowledge of LF in the study area was generally low, especially as regards the mode of transmission. Hence, not much is done by

residents to prevent mosquito bites. The survey showed knowledge of MDA in the study area is very low and the people also did not understand the role of MDA to prevent and control the disease. There is a need for increased awareness of both the disease and the goal of MDA program in the study area. Awareness can be increased through health education on the causes, mode of transmission, symptoms, prevention, treatment, and control of the disease.

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Authors Contributions:

Conceptualization: Jaiyeola T.M and Udoh Ekerette E. Literature search: Jaiyeola T.M and Adebambo A.B. Data collection: Adebambo A.B, Jaiyeola T.M and Udoh Ekerette. Statistical analysis: Jaiyeola T.M and Udoh Ekerette. Manuscript drafting: Jaiyeola T.M. Manuscript editing and review for intellectual content: Udoh Ekerette E. All authors have read and approved the reviewed final version of the manuscript.

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