ISSN: 2329-891X
Journal of Tropical Diseases & Public Health

OPEN ACCESS Freely available online

Research Article

Prevalence, Knowledge and Perception of Lymphatic Filariasis in Yenagoa Local Government Area, Bayelsa State, Nigeria

Awiya B Henry[1*], Amawulu Ebenezer[1], Nduka Florence[2], Chinwe Eze N[2]

[1]Department of Biological Sciences, Niger Delta University, Wilberforce Island, Bayelsa State, Nigeria; [2]Department of Animal and Environmental Biology, University of Port Harcourt, Choba, Rivers State, Nigeria

ABSTRACT

Lymphatic Filariasis (LF) is a debilitating Neglected Tropical Disease of a major public health importance caused by the parasitic nematodes; *Wuchereria bancrofti*, *Brugia malayi* and *Brugia timori*. This study determined the prevalence of lymphatic filariasis together with its knowledge and perception in rural and urban settlements in Yenagoa Local Government Area of Bayelsa State. A low prevalence of 1% was recorded, however there was variation in the communities with Agbura (2.7%), followed by Yenizue-gene (0.9%) while Tombia and Akenfa were (0.0%). Higher prevalence was recorded in males 116 (1.7%) than female 184 (0.5%), but there was no significant difference (P>0.05). The prevalence of lymphatic filariasis regarding age revealed that the age bracket (21-30) had the highest with 2 (2.6%) which was followed by (31-40) age bracket with 1 (1.2%). The data from the research questionnaire showed that participants knowledge on causes, mode of transmission and prevention of lymphatic filariasis were low while the perceptions towards the socio-economic impacts of lymphatic filariasis were high, hence the involvement of respondents across the study communities.

Keywords: Lymphatic filariasis; *Wuchereria bancrofti*; Prevalence; Knowledge; Perception; Bayelsa State

INTRODUCTION

Lymphatic Filariasis (LF) is a debilitating Neglected Tropical Disease caused by the parasitic nematodes; *Wuchereria bancrofti*, *Brugia timori* and *Brugia malayi* [1]. The adult worm dwells in the lymphatic system inducing permanent disability in human with its disability adjusted life years trailing second highest behind malaria [2]. Report from the World Health Organization documented that over 856 million people across 52 nations of the world are susceptible to the disease, Nigeria alone has the prevalence of 22.1% which was fourth to India, Indonesia and Guinea Papua with the North-Central accounting for 8.2%, North-West region carries 7.8%, South-East with 7.1%, and South-South had 2.5% prevalence [3-5]. Although the mortality from this disease is quite low, factors accountable for the prevalence of the disease in both rural and urban areas may include poor hygienic conditions and overcrowding [6].

The Global Programme to Eliminate Lymphatic Filariasis (GPELF) with the aim of reducing its serious economic and social burden was instituted in the year 2020 [7,8]. Lymphatic filariasis has been considered an urban disease [9]. However, literatures have shown that the parasite and vector have adapted to rural pocket [10]. Understanding the distribution, prevalence and cultural concepts of belief and perceptions of the disease are prerequisites to accomplishing the global elimination programmes [10]. Little of this information is documented in Bayelsa State. This research is therefore designed to provide reliable baseline data on the prevalence of lymphatic filariasis in selected urban and rural communities in Yenagoa Local Government Area, Bayelsa State. The result shall guide intervention activities in Yenagoa Local Government Area of Bayelsa State, South-south Nigeria.

MATERIALS AND METHODS

Area of study

This study was carried out in Yenagoa Local Government Area, Bayelsa State. Yenagoa Local Government Area (4055' 17.39 N and 6015' 30.60E) is the municipal capital of Bayelsa State. The description of the study locations has been discussed extensively [11]. The study locations were Akenfa, Yenizue-gene, Tombia and Agbura during March-May, 2020.

Correspondence to: Awiya B Henry, Department of Biological Sciences, Niger Delta University, Wilberforce Island, Bayelsa State, Nigeria, E-mail: ebenezeramawulu@gmail.com

Received: 06-Jun-2023, Manuscript No. JTD-23-21740; **Editorial assigned:** 09-Jun-2023, PreQC No. JTD-23-21740 (PQ); **Reviewed:** 26-Jun-2023, QC No. JTD-23-21740; **Revised:** 04-Jul-2023, Manuscript No. JTD-23-21740 (R); **Published:** 12-Jul-2023, DOI: 10.35241/2329-891X.23.11.387

Citation: Henry AB, Ebenezer A, Florence N, NC Eze (2023) Prevalence, Knowledge and Perception of Lymphatic Filariasis in Yenagoa Local Government Area, Bayelsa State, Nigeria. J Trop Dis. 11:387.

Inclusion and exclusion criteria

Only participants within the age of ten years and above and who have resided within the communities for at least six months from the time of study were included in the study. Participants not residing within the study communities and less than ten years respectively were excluded.

Study population and sample size

The study was carried out in four randomly selected communities in Yenagoa Local Government Area, Bayelsa State based on accessibility and willingness to participate in the study. The sample population comprised as follows: Akenfa, Yenizue-gene Tombia and Agbura respectively. All participants who presented at the community health centers represent the sample. Sample size for this study was determined according to the formula in Cochran (1963) [11]. A total sample of 300 was obtained.

Ethical approval

Ethical clearance was obtained from the University of Port Harcourt Research Ethics Committee, Bayelsa State Ministry of Health Research Ethics Committee and the CDC of the various communities.

Sample collection and processing of blood for circulatory antigen

The blood samples were collected from consented individuals with the help of a nurse from the Primary Health Centers after when the importance of the study was explicitly elucidated to them. A self-designed questionnaire tagged: the knowledge, attitude and perception of lymphatic filariasis was also given to the consented individuals to fill. Duly filled questionnaires were retrieved and checked for correctness in a Microsoft excel. One millilitre (1 ml) of peripheral blood samples were collected from three hundred (300) participants using a fingerpick method into micropipette and duly labelled. A drop of the blood specimen was applied into the sample well filarial test kits (Filariasis IgG/IgM Cat: IFI-422, Version: 02; Encode Medical Engineering Co., China), followed by a drop of diluent buffer. The test kit was allowed to lie parallel on a plane surface. Results were then read in 15 minutes. A positive result was recorded when a coloured line appears in a control region (C) region T1. When coloured line appears in the control region (C) appears but no line appears in test line regions T1 or T2, the result was recorded as negative. An Invalid result was recorded when the Control line fails to appear in both C and T1 or T2.

Data analysis

Descriptive statistics such as frequency and percentage was used to show the frequency of occurrence of lymphatic positive cases among the participants. The relationship between variables was assessing using chi square at 0.05 level of confidence. These analyses were done using Statistical Package for the Social Sciences (SPSS) version 23.0.

RESULTS

Socio-demographic data of study population

A total of 300 participants were sampled in four randomly selected communities in Yenagoa Local Government Area of Bayelsa State; 116 representing 38.7% were male and 184 (61.3%) were female. The age characteristics of the population were 10-20 (15.3%), 21-30 (25.7%), 31-40 (27.3%), 41-50 (13.3%) 51-60 (10.7%) and 61 and above (7.7%). The educational qualifications were more of the secondary school level representing (39.3%) followed by non-formal education (22.7%), tertiary (20.3%) and the least was the primary education level (17.7%). The occupational characteristics of the study population in order of their increasing frequency are farming/fishing (18.3%), trading (23.0%), others (27.0%) and students (31.7%). More of the respondents were married (44.0%) and the least was separated (5.3%). The variations of the study population. Details of the demographic information of the study population are shown in Table 1.

Table 1: Socio-demographic data of study population

Variables	N= (300)	Percentage (%)
Sex		
Male	116	38.7
Female	184	61.3
Age Group		
10–20	46	15.3
21–30	77	25.7
31–40	82	27.3
41–50	40	13.3
51–60	32	10.7
61+	23	7.7
Educational Level		
Non-Formal	68	22.7
Primary	53	17.7
Secondary	118	39.3
Tertiary	61	20.3
Occupation		
Farming/Fishing	55	18.3
Trading	69	23
Others	81	27
Students	95	31.7
Marital Status		
Married	132	44
Single	131	43.7
Widow/Widower	21	7
Separated	16	5.3

Overall prevalence of circulating filarial antigen in the study communities

Out of 300 participants examined for circulating filarial antigen, 3(1.0%) were positive. More infection (2.7%) was recorded in Agbura, followed by Yenizue-gene (0.9%). None showed

positive in Tombia and Akenfa communities. Differences in the community variation of circulating filarial antigen was not significant (χ^2=3.308; P>0.347; p>0.05). Higher prevalence (1.4%) of the circulating filarial antigen was recorded in rural settlement than in urban settlement (0.6%). Although the variation was not significant (χ^2=0.487[a]; P>0.485) (Table 2). More males 2(1.7%) than females 1(0.5%) Differences was not significant (χ^2=1.002[a]; P 0.317) (p>0.05). The prevalence decrease with increase in age with highest prevalence (2.6%) was recorded among age bracket 21-30, followed by age bracket 31-40 (1.2%). Differences in the age variation of the circulating filarial antigen (χ^2=[s]3.499[a]; P 0.631) was not significant (p>0.05). Among the infected individuals, the highest prevalence (1.9%) was recorded among those with primary education; followed by non-formal education (1.5%) while the least (0.9%) was among secondary education. Differences (X^2 1.217[a]; P 0.749) was not significant (p>0.05). The highest prevalence was among the Farming/fishing occupation (3.6%), followed by trading (1.5%) (Table 3).

Knowledge on Lymphatic Filariasis (LF) in the study location during March-May, 2020.

Detailed information on the knowledge of Lymphatic filariasis is shown in the Table 4. Out of the 300 individuals that participated in the study, 101 (33.7%) had knowledge of lymphatic filariasis while 199 (66.3%) had no knowledge of LF. Only 13 (4.3%) heard that lymphatic filariasis was transmitted by mosquito, 33 (11.0%) believed it was due to stepping on charms (juju), 42 (14.0%) believed it was due to inadequate personal hygiene, 17 (5.7%) stepping on dirty water while 190 (63.3%) had no knowledge on the mode of transmission of lymphatic filariasis. With regards to the socio-economic impact, 64 (21.3%) acknowledged that it was personally uncomfortable in public, 27 (9.0%) admitted that LF affects work and income, 17 (5.7%) believed that it affected sexual relationship with spouse while 192 (64.0%) had no idea on the socio-economic impacts of LF. Only 23 (7.7%) believed that lymphatic filariasis could be prevented and managed by sleeping under mosquito nets while 67 (22.3%) believed it could be prevented and managed by

Table 2: Overall prevalence of circulating filarial antigen in the study communities

Location/Settlement	Number Examined	Number Positive	% Positive
Rural			
Tombia	66	0	0
Agbura	74	2	2.7
Urban			
Akenfa	45	0	0
Yenizue-gene	115	1	0.9
Sex			
Male	116	2	1.7
Female	184	1	0.5
Age			
Oct-20	46	0	0
21-30	77	2	2.6
31-40	82	1	1.2

Table 3: Prevalence of Circulating Filarial Antigen by Socio-economic Status across Sex

Socio-economic Status	Scx						All Sexes		
	Male			Male					
	No. Examined	No. Positive	% Positive	No. Examined	No. Positive	% Positive	No. Examined	No. Positive	% Positive
Educational									
Non-Formal	18	1	5.6	50	-	-	68	1	1.5
Primary	30	-	-	23	1	4.3	53	1	1.9
Secondary	56	1	1.8	62	-	-	118	1	0.9
Tertiary	21	-	-	40	-	-	61	-	-
Occupation									
Farming/Fishing	35	2	5.7	20	-	-	55	2	3.6
Trading	28	-	-	41	1	2.4	69	1	1.5
Others	52	-	-	29	-	-	81	-	-
Students	60	-	-	35	-	-	95	-	-

Table 4: Respondents Knowledge on Lymphatic Filariasis (LF)

Variables	Frequency	Percentage %
Knowledge of Lymphatic Filariasis		
Yes	101	33.7
No	199	66.3
Source of Knowledge		
Home/Neighbor's/Friends	53	17.7
Media	25	8.3
Hospitals/Dispensaries	23	7.7
From Previous LF Attack	0	0
Do not Know	199	66.3
Mode of Transmission		
Mosquito Bite	13	4.3
Stepping on Charm (juju)	33	11
Eating Contaminated Food	5	1.7
Inadequate Personal Hygiene	42	14
Stepping on Dirty Water	17	5.7
Do not Know	190	63.3
Socio-economic Impacts		
Personally Uncomfortable in Public	64	21.3
Affect Work and Income	27	9
Affect Sexual Relationship with Spouse	17	5.7
Do not Know	192	64
Prevention and Management of LF		
Keeping the Environment Clean	67	22.3
Taking Prescribed Drugs	26	8.7
Sleeping Under Mosquito Nets	23	7.7
Do not Know	184	61.3

keeping the environment clean.

DISCUSSION

The prevalence of Circulating Filarial Antigen (CFA) in Yenagoa Local Government Area of Bayelsa State was 1% and was considered to be low. The low prevalence rate was comparable with 0.22% and 0.0% prevalence in two locations in Suriname and Trinidad respectively, 0.11% in Cameroun, 0.4% in Central Nigeria and (0.5%) prevalence in Rwanda [12-15]. However, the prevalence rate was two-fold lower than the 2.4% prevalence recorded in Ogun State, Nigeria and elsewhere in South-South region [4,5,14]. The low prevalence rate had been attributed to mass administration of filarial drugs. The low circulating filarial antigen in this present study may not be unconnected with the sample sizes.

This drift of prevalence rates across communities was also observed and has been reported elsewhere in Nigeria [16,17]. The higher prevalence of LF in Agbura in this study was attributed to the poor socio-economic status of the people. Poverty, poor environmental conditions, poor access to medical facilities and poor housing systems were prevalent in Agbura as a representative of the rural settlement. The poor housing system and the occupation of the people may have predisposed them to the bite of the insect vector mostly Culex quinquefasciatus. Yenizue-gene and Akenfa are communities within the urban areas. The low prevalence may be due to the improved housing and access to medical facilities. The overall prevalence of the filarial antigen in rural than in urban settlements agrees with Elkanah et al. but contrasts the observation that lymphatic filariasis are considered as an urban disease [16,9]. However, the prevalence in rural settlement is an affirmation that the disease which was once an urban disease have adapted to rural areas [1,4].

More males than females were infected. Similar reports have been recorded in Amassoma, Bayelsa State; in Zamfara State and in Ogun State [11,16,17]. However, in some other reports, females were more infected than males [18,19]. More infection in males in this present study is an indication that males are more predisposed to mosquito bites due to their high involvement in fishing and farming activities in the study area. Although, the biting rhythm of the mosquito and fishing activities were not compared in this

present study, Ebenezer et al. [20], have reported that the peak biting period of mosquitoes correspond with the fishing activities in the coastal area in Bayelsa State. The insignificant differences between male and female infection in this present study implies that both male and female are engaged equally in activities that exposed them to the vector.

In this present study, prevalence decreases as age increases. This is in in accordance with Ebenezer et al. [11,13]. More infection among age (21-30) could be due to their more involvement in activities that may have predisposed them to the vector including farming and fishing. The age bracket>60 had no result of circulating filarial antigen. This result contrasts the report of Muawiyya et al. Who reported that age bracket 51-60 yrs had the highest prevalence. The differences in occupation related prevalence of circulating filarial antigen was not statistically significant among farming/fishing, traders and students [19].

The knowledge about lymphatic filariasis in the study communities was low. Some believed it was transmitted by stepping on charm (juju), inadequate personal hygiene and stepping on dirty water while only few of them acknowledged that lymphatic filariasis was transmitted from mosquito bites. The low knowledge about lymphatic filariasis in the present study contrasts the reports elsewhere who reported that majority of the participants were aware of lymphatic filariasis and recognized the disease mainly by its disfiguring manifestation [21]. None of the respondents also had any knowledge of MDA programs or drugs used in the treatment or prevention of lymphatic filariasis. Hence, it was not surprising that the respondents in the study were ignorant about lymphatic filariasis. Sensitization on Lymphatic Filariasis was also poor in the rural and urban areas of Bayelsa State, Nigeria. The perception on socio-economic impacts of lymphatic filariasis was observed to be high across the study communities. [5, 22-24].

CONCLUSION

The prevalence of circulating filarial antigen has been established in Yenagoa Local Government Area of Bayelsa State. Both the prevalence rate of circulating filarial antigen and knowledge of LF was low in the study area. The infection exists both in rural and urban communities, although the prevalence rate in rural settlements were higher than those in urban settlements. This may be due to her poor housing system, low level of health education, inadequate health care facilities and the occupation of the people which may have predisposed them to the bite of the insect vector mostly Culex quinquefasciatus. In the study area, both gender and age groups were infected with circulating filarial antigen.

ACKNOWLEDGEMENT

We appreciate the assistance of the communities' head for allowing the research to be done in their communities. We also appreciate all the volunteers during the blood collections.

REFERENCES

1. Ojurongbe O, Akinbo JA, Ogiogwa IJ, Bolaji OS, Adeyeba OA. Lymphatic filariasis in a rural community in Nigeria: A challenge ahead. Afr J Med Med Sci. 2010;39:179-183.
2. WHO. Global programmes to eliminate Lymphatic filariasis: Progress report 2000-2009 and strategic plan 2010-2020. World health organization. 2010.
3. World Health Organization.Summary of Global Update on Preventive Chemotherapy Implementation in 2016: Crossing the Billion. Weekly Epidemiological Records. 2016; 92:589-593.
4. Okorie PN, Ademowo GO, Saka Y, Davies E, Okoronkwo C, Bockarie MJ, et al. Lymphatic filariasis in Nigeria; micro-stratification overlap mapping (MOM) as a prerequisite for cost-effective resource utilization in control and surveillance. PLoS neglected tropical diseases. 2013;7(9):e2416.
5. Eneanya OA, Fronterre C, Anagbogu I, Okoronkwo C, Garske T, Cano J, et al. Mapping the baseline prevalence of lymphatic filariasis across Nigeria. Parasit Vectors. 2019:1-3.
6. Nwoke BE, Dozie IN, Jiya J, Saka Y, Okoronkwo C, Ogidi JA, et al. The prevalence of hydrocele in Nigeria and its implication on mapping of lymphatic filariasis. Niger J Parasitol. 2006;27(1):29-35.
7. Ottesen EA. The global programme to eliminate lymphatic filariasis. Trop Med Int Health. 2000;5(9):591-594.
8. Omudu EA, Okafor FC. Study of chronic lymphatic filariasis related knowledge, attitudes and perception among three ethnic groups in Benue State, Nigeria. Niger J Parasitol. 2011;32(1).
9. Paul ES, Mbutolwe EM. Urban Lymphatic Filariasis. Parasitology Res. 2013;112:35-44.
10. Omudu EA. Thesis on Sero-Epidemiological and Socio-Cultural Studies on Lymphatic Filariasis in Benue State, Nigeria. Federal University of Technology, Owerri, Nigeria. 2008.
11. Ebenezer A, Amadi EC, Agi PI. Studies of the microfilaria, antigeneamia and clinical signs of bancroftian filariasis in Epie creek communities, Niger Delta, Nigeria. Int Res J of Microbiol. 2011;2(9):370-374.
12. Rawlins SC, Lammie P, Tiwari T, Pons P, Chadee DD, Oostburg BF, et al. Lymphatic filariasis in the Caribbean region: The opportunity for its elimination and certification. Rev Panam Salud Publica. 2000;7(5):319-324.
13. Nana-Djeunga HC, Tchatchueng-Mbougua JB, Bopda J, Mbickmen-Tchana S, Elong-Kana N, Nnomzo'o E, et al. Mapping of Bancroftian filariasis in Cameroon: Prospects for elimination. PLoS Negl Trop Dis. 2015;9(9):e0004001.
14. Eigege A, Evans DS, Noland GS, Davies E, Umaru J, Criteria to stop mass drug administration for lymphatic filariasis have been achieved throughout Plateau and Nasarawa states, Nigeria. Am J Trop Med Hyg. 2017;97(3):677.
15. Ruberanziza E, Mupfasoni D, Karibushi B, Rujeni N, Kabanda G, Mapping of Lymphatic Filariasis in Rwanda. J Lymphoedema. 2009;4: 20-23.
16. Elkanah OS, Elkanah DS, Wahedi JA, Kela SL, Samaila A, Madara A. Field Comparison between Blood Immunochromatographic Card Test and Microscopy in Diagnosis of Bancroftian Filariasis in Northern Taraba State, Nigeria. Int j trop dis. 2020;3:042.
17. Muawiyya UL, Tukur A, Aminu YB, Muhtari JL. Sero-Prevalence of lymphatic Filariasis in six Communities of Talata mafara Local Government Area, Zamfara State, Nigeria. J Parasitol Res. 2019.
18. Elkanah OS, Elkanah DS, Wahedi JA, Samaila SL, Nyanwu GI. Lymphatic Filariasis in Muri Emirate: Clinical and Parasitological Studies in Jalingo L. G. A, Taraba state, Nigeria. Asian J Med Health. 2017;6(1):1-7.
19. Mbah M, Iquo-Out B, Akpan S, Imeobong I. Eba F. Prevalence Rate and Detection of *Wuchereria bancrofti* Wb123 Antigen using IgG4 Antibodies in Bakassi Local Government Area of Cross River State, Nigeria. Journal of Pharmacy and Biological Sciences. 2018.
20. Ebenezer A. The Circadian and Seasonal Biting Patterns of Anopheles gambie sl. in Bayelsa State, Nigeria. J Parasitol Vector Biol. 2017; 9(8):111-115.

21. Kouassi BL, BarryA, Heitz-Tokpa K, Krauth SJ, Goepogui A, Balde MS, et al. Perceptions, Knowledge, Attitudes and Practices for the Prevention and Control of Lymphatic Filariasis in Conakry, Republic of Guinea. Acta Tropica, 179:109-116.

22. Dogara MM, Nock HI, Agbede RIS, Ndams IS. Survey of Knowledge, Attitudes and Perceptions (KAPs) of Lymphatic Filariasis Patients in Kano State, Nigeria. Int Res J of Pub c. 2014;1(10):207-210.

23. Nzeako SO, Nduka FO, Okunnuga OH, Ezenwaka CO. Lymphatic Filariasis and Malaria Awareness amongst Residents of Port Harcourt Metropolis. Int J Appl Sci. 2016;3:6.

24. Amaechi EA, Ohaeri CC, Ukpai MA, Nwachukwu PC, Ukoha U. Lymphatic Filariasis: Knowledge, Attitude and Practices among Inhabitants of an Irrigation Project Community, North Central Nigeria. Asian Pac J Trop Dis. 2016;6(9):709-713.