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Lymphatic Filariasis in Muri Emirate: Clinical and Parasitological Studies in Jalingo LGA, Taraba State, Nigeria

O. S. Elkanah[1], D. S. Elkanah[1], J. A. Wahedi[2*], A. B. Samaila[3], S. L. Kela[3] and G. I. Anyanwu[3]

[1]Department of Biological Sciences, Taraba State University, Jalingo, Nigeria.
[2]Department of Zoology, Adamawa State University, Mubi, Nigeria.
[3]Applied Parasitology Unit, Department of Biological Sciences, ATBU, Bauchi, Nigeria.

Authors' contributions

This work was carried out in collaboration between all authors. Author OSE designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author SLK supervised the study. Authors OSE and DSE managed the analyses of the study. Authors JAW and GIA managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Survey of prevalence of clinical manifestation of lymphatic filariasis was carried out in Jalingo LGA. Informed oral consent of individuals were sought and obtained before they were examined in secrecy for clinical signs and symptoms of filariasis. Night blood samples of consenting individuals were also obtained using finger-prick method between 20.00hrs and 01.00hrs. Four-hundred and fifty eight night blood samples were collected, and 33.58% were infected with *Wuchereria bancrofti*. There was a significant difference in infection among the different age groups. The various clinical manifestations encountered were: itching, adenolymphagitis, dermatitis, elephantiasis, hydrocoele, hernia and lymphoedema of breast at varying rates. There was a close association between the occurrence of *W. bancrofti* and itching, adenolymphagitis, hydrocoel, dermitis; while weak

**Corresponding author: E-mail: wahedijasini@gmail.com, wajasini@yahoo.com;*

association were observed between microfilaraemia and Hernia, elephantiasis of the limb and lymphoedema of the breast. The prevalence of chronic and irreversible manifestations of the disease create strong imperative on the need to initiate control programmes within the province.

Keywords: Adenolymphagitis; lymphoedema; lymphatic filariasis; microfilarial density.

1. INTRODUCTION

Lymphatic filariasis due to infection with *Wuchereria bancrofti* is a major public health problem which affects at least 128 million people of all ages and sexes worldwide [1,2]. Available literatures on the status of the disease in Nigeria show that the disease is prevalent and widespread in the six geo-political zones of the country [3,4]. Nigeria is the third most endemic country in the world after India and Indonesia [5,6]. The clinical manifestation of lymphatic filariasis ranges from periodic reoccurring attacks of localized inflammation, tenderness and pain, often accompanied by fever, nausea and vomiting known as acute adenolymphagitis (ADL) to chronic symptoms including lymphoedema, elephantiasis and chyluria [7]. The socio-economic and psychological burden of the disease is enormous, these include direct cost of treatment and losses resulting from incapacitation and loss of labour [8].

The World Health Assembly at its meeting in May 1997 passed a resolution for the elimination of Lymphatic filariasis as a public health problem through Mass Drug Administration (MDA) in endemic communities [9]. Unfortunately, available information on areas that are endemic is lacking and until data on the distribution of the disease is available many communities will be by passed by control teams. This study is undertaking to provide base line data for mass drug administration.

2. MATERIALS AND METHODS

2.1 Description of the Study Area

The study area was Jalingo LGA, Taraba State, Nigeria. Jalingo Local Government is divided into eight wards with two major ethnic groups and four minor ones. The majority of the inhabitants live in rural agricultural areas with farming as the major occupation. The LGA has numerous streams transversing villages/communities and draining into the major river Benue. Communities rely mainly on the streams and river for water supply. Domestic water is usually stored in and around homes in drums, clay pots and all sorts of metal and plastic containers which provide permanent breeding sites for mosquitoes and ecological associates [10].

2.2 Ethical Clearance and Permission

The study receive ethical clearance certificate from the Institutional Health Research Committee and ethical approval of Taraba State Ministry of Health. Also additional permission were sought and obtained from Local Government chairman, Primary Health Care (PHC) Department, Districts heads, Village heads, and key informants before the study.

2.3 Rapid Assessment Method

On the schedule day, informed consent of individuals who gathered at the agreed venue (Village head compound, school or church premises) were sought and obtained after the explanation of the procedures and the benefits of the study before they were examined in secrecy for clinical signs and symptoms of filariasis, following the procedures described by Usip et al. [4] and Edungbola et al. [11]. Clinical symptoms like Itching, ADL, Dermatitis, Lymphoedema of limbs, breast and Scrotal Elephantiasis were recorded in personal data form containing the patients name. Female examination was restricted to the legs, arms and breast because of cultural inhibitions in most communities.

2.4 Parasitological Examination

Night blood samples of consenting individuals were obtained between 20.00 hrs and 01.00 hrs. At each blood collection, the left thumb finger was cleaned with methylated spirit soaked cotton wool. A sterile blood lancet was used to pricked the finger and 60 µl of blood collected on a slide was used to make a thick blood film which was air dried and stained with 10% Giemsa solution for 10 minutes [12]. The slides were then examined under a light microscope at X10, X40 and X100 objective lenses. Sheathed microfilariae without caudal nuclei were classified as *Wuchereria bancrofti* [12].

2.5 Statistical Analysis

Data obtained were analyzed using Epi-info Version 7.0 software. Chi-square test, two-way ANOVA and Pearson's correlation coefficient were used to test for differences in infection rates and the degree of relationship between presence of *Wuchereria bancrofti* and various clinical symptoms respectively.

3. RESULTS

Of the 458 persons examined, 155 (33.84%) were positive for *Wuchereria bancrofti.* Although infection was recorded in all the seven communities, the highest proportion was recorded in Jauro Ishaya community (45.83%), followed by Danganga community (38.46%) and the least was in Janibanbu community (28.04%) (Table 1). The prevalence of microfilarial infection by age and sex is shown in Table 2. There was no significant difference in infection between females (34.21%) and males (32.84%) subjects. Females (34.21%) were more frequently infected than the males (32.84%) (χ^2 = 0.012, df =1, p>0.05). In both sexes, prevalence of infection increases rapidly with age but slowed down among individuals between the age of 51 and 60 years. Infection also differed significantly among age groups (χ^2=22.485, p<0.05). Occupation-related prevalence is shown in Fig. 1. Infection appeared to be so common among local brewers (50.2%) followed by farmers (39.84%). However, chi-square analysis did not show any significant difference in infection (χ^2 = 3.218, p>0.05). Clinical indicative symptoms of lymphatic filariasis in relation to age and sex are shown in Table 3. The most frequent chronic clinical symptom is hydrocoel among men (14.20%), followed by elephantiasis (9.7% in males and 20.0% in females), hernia (3.7%) and breast enlargement (0.5%). Pearson correlation analysis show a close association between the presence of *Wuchereria bancrofti* and Itching (r=0.694, p<0.05), ADL (r=0.809, p<0.05), Hydrocoel (r=0.587, p<0.05) and Dermatitis (r=0.561, p<0.05). However a weak association was observed between Microfilaraemia and Elephantiasis (r=0.311, p>0.05), Hernia (r=0.201, p>0.05) and Breast lymphoedema (r=0.131, p>0.05).

Table 1. Overall prevalence of lymphatic filariasis in the communities of Jalingo LGA

Community	Total no. examined	No. infected (%)
Danganga	26	10 (38.46)
Jauro Voto	47	14 (29.79)
Jauro Ishaya	48	22 (45.83)
Kpanti-Napo	62	19 (30.65)
Nwagwalah	69	27 (39.13)
Sembe	99	33 (33.33)
Janibanbu	107	30 (28.04)
Total	458	155 (33.84)

Table 2. Prevalence of lymphatic filariasis in communities in Jalingo LGA in relation to age and sex

Age group	Male		Female		Total	
	No. examined	No. infected	No. examined	No. infected	No. examined	No. infected
1-10	33	4 (12.12)	5	2 (40.00)	38	6 (15.79)
11-20	76	21 (27.63)	41	12 (29.27)	117	33 (28.21)
21-30	47	14 (29.79)	35	9 (25.71)	82	23 (28.05)
31-40	39	12 (30.77)	33	8 (24.24)	72	20 (27.78)
41-50	36	22 (61.11)	28	15 (53.57)	64	37 (57.81)
51-60	22	10 (45.45)	25	10 (40.00)	47	20 (42.55)
61-70	11	5 (45.45)	15	5 (33.33)	26	10 (38.46)
71>	4	2 (50.00)	8	4 (50.00)	12	6 (50.00)
Total	268	90 (33.58)	190	65 (31.58)	458	155 (33.84)

Table 3. Clinical signs indicative of lymphatic filariasis in relation to age and sex in Jalingo LGA

Age	No. examined	Sex		Itching (%)	Fever/ADL (%)	Dermatitis (%)	Elephantiasis (%)	Hydrocoel (%)	Hernia (%)	Breast enlargement
1-10	38	M	33	15 (45.5)	16 (48.5)	4 (12.1)	1 (3.0)	1 (3.0)	1 (3.0)	0 (0.0)
		F	5	2 (40.0)	3 (60.0)	0 (00.0)	0 (00.0)	0 (00.0)	0 (0.0)	0 (0.0)
11.20	117	M	76	40 (52.6)	47 (61.8)	10 (13.2)	5 (6.8)	9 (11.8)	1 (1.3)	0 (0.0)
		F	41	20 (48.8)	23 (56.1)	4 (9.8)	2 (4.9)	0 (0.0)	0 (0.0)	1 (2.4)
21-30	82	M	47	19 (40.4)	23 (48.9)	8 (17.0)	1 (2.1)	4 (8.5)	1 (2.1)	0 (0.0)
		F	35	15 (42.8)	15 (42.8)	10 (28.6)	7 (20.0)	0 (0.0)	0 (0.0)	0 (0.0)
31-40	72	M	39	22 (56.4)	20 (51.3)	7 (17.9)	4 (10.3)	3 (7.7)	2 (5.1)	0 (0.0)
		F	33	16 (25.0)	24 (72.7)	4 (12.1)	5 (9.1)	0 (0.0)	0 (0.0)	0 (0.0)
41-50	64	M	36	21 (58.3)	22 (37.3)	8 (22.2)	4 (11.1)	8 (22.2)	2 (5.6)	0 (0.0)
		F	28	26 (92.9)	13 (20.3)	10 (45.5)	8 (28.6)	0 (0.0)	0 (0.0)	0 (0.0)
51-60	47	M	22	15 (68.2)	12 (54.5)	8 (36.4)	8 (36.4)	8 (36.4)	3 (13.6)	0 (0.0)
		F	25	12 (25.0)	10 (21.3)	12 (48.0)	10 (40.0)	0 (0.0)	0 (0.0)	0 (0.0)
61-70	26	M	11	9 (81.8)	9 (81.8)	4 (36.4)	2 (18.2)	4 (36.1)	0 (0.0)	0 (0.0)
		F	15	8 (53.3)	8 (53.3)	5 (33.3)	3 (20.0)	0 (0.0)	0 (0.0)	0 (0.0)
71>	12	M	4	4 (100.0)	4 (100.0)	2 (50.0)	1 (25.0)	1 (25.0)	0 (0.0)	0 (0.0)
		F	8	6 (75.0)	3 (37.5)	6 (75.0)	3 (37.5)	0 (0.0)	0 (0.0)	0 (0.0)
Total	458	M	268	145 (54.1)	153 (57.0)	51 (19.0)	26 (9.7)	38 (14.2)	10 (3.7)	0 (0.0)
		F	190	100 (52.6)	99 (52.1)	51 (31.1)	38 (20.0)	0 (0.0)	0 (0.5)	1 (0.5)

No. = Number; M = Male; F = Female

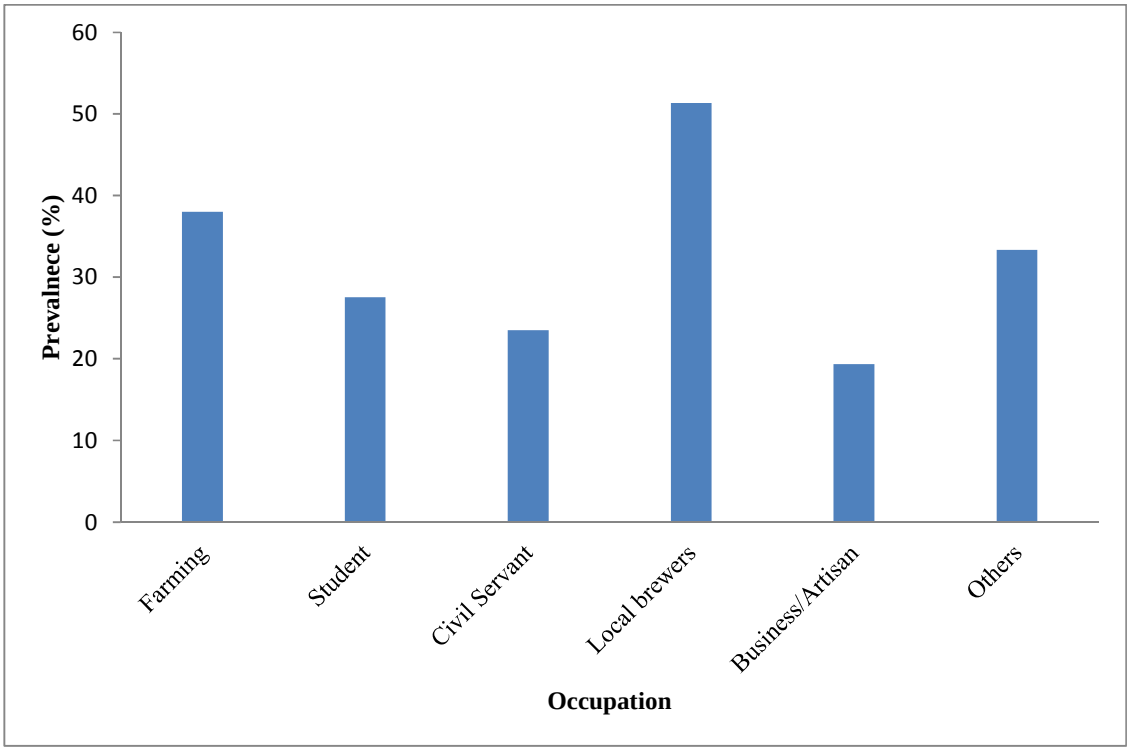

Fig. 1. Occupation related prevalence of lymphatic filariasis in Jalingo

4. DISCUSSION

The results of this study showed that lymphatic filariasis is endemic in Jalingo LGA of Taraba State and active transmission could be going on, since community members live in houses that are unprotected and exposed to vector-mosquito species. According to Terranella et al. [13] and Christiana et al. [14], the populations at high risk for contracting lymphatic filariasis infection are usually those that are poor, and concentrated mainly in rural areas. This also agrees with Anosike et al. [15] and Okon et al. [16], who reported that significant variation in prevalence between communities could be attributed to differences on the socio-economic status, local environmental conditions and the absence of ecological conditions that favour the breeding of the vectors.

The absence of significant difference in infection among gender suggests that both sexes are equally exposed to the bites of mosquito species since they engaged in similar activities. This observation is consistent with other reports [4,17, 18]. In this study, prevalence of infection increased rapidly with age in both sexes. This is similar to the findings of Oparaocha et al. [3] and Usip et al. [4]. The age-related prevalence is mainly due to steady progression of infections acquired in early childhood [19].

The strong relationship between microfilaraemia and itching, ADL and dermatitis suggest that these manifestations could be considered as a clinical diagnostic index for estimating Lymphatic filariasis endemicity as observed by Akogun et al. [17]. The observed chronic manifestations of Lymphatic filariasis e.g. Lymphoedema of limbs and hydrocoel corroborates with the findings of Adekunle et al. [18] who reported similar occurrence in Osse, Ondo State, Nigeria.

5. CONCLUSION

Lymphatic filariasis is meso-endemic in Jalingo LGA with chances of prevalence, intensity and clinical symptoms increasing overtime. There are strong indications that there could be more affected people than those examined since the disease is stigmatized. There is an urgent need to institute control measures with the aim of halting the transmission. The combination therapy of albendazole and mectizan in eradicating the adult worm and microfilariae is advocated in the entire province.

CONSENT

As per international standard or university standard, patient's written consent has been collected and preserved by the authors.

ETHICAL APPROVAL

As per international standard or university standard, written approval of Ethics committee has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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