

Lymphatic Filariasis among the Ndoki People of Ukwa East Local Government Area, Abia State, Eastern Nigeria

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Abstract

A study was carried out to investigate the age and gender prevalence of lymphariasis due to *Wuchereria bancrofti* in eight communities of Ukwa East L.G.A, Abia State, Nigeria between February and September, 2012. Finger prick blood smear samples collected from the subjects were examined for *W.bancrofti* using standard Parasitological techniques. One hundred and eleven (22.3 %) out of the 498 blood samples were positive for microfilariae in their thick blood smear. The highest number of positive cases (43.1 %) was observed from Azumini community, while the least number of positive cases was observed in Ohuru (7.0 %). Infection rates among communities differed significantly (ANOVA, $P < 0.05$). The peak prevalence occurred between 31 and 40 years age group (52.3 %) with the least recorded in the age group 71 and above (2.4 %). Farmers and fishermen were observed to be more infected (34.7 %) which differed significantly ($P < 0.05$) from other occupation. The only clinical manifestation found in the study was lymphedema of the leg (1.4 %). Intervention programme by expanding the distribution of albendazole and ivermectin to all endemic areas of the state is however advocated.

Keywords: Prevalence, *Wuchereriabancrofti*, Ukwa East, Abia State, Nigeria

Introduction

Lymphatic filariasis (LF) is a debilitating disease of major public health importance, caused by several species of mosquito-borne filarial nematodes, which includes *Brugiamalayi*, *Brugiatimori* and *Wuchereria bancrofti* with greater than 90% of cases attributable to *W. bancrofti*. It is estimated that about 120 million people in the world have LF where about 1.1 billion are at risk of becoming infected. African countries carry over a third of the global burden of Lymphatic filariasis [1]. Nigeria is known to be the third most endemic country for this disease after India and

Indonesia where 22.1% of its population is thought to be infected [2]. Mortality from Lymphatic filariasis is relatively low, the disease is a leading cause of permanent and long-term disability, clinical suffering and handicap. The clinical manifestations of Lymphatic filariasis include both acute and chronic signs and symptoms that manifests in the form of localized inflammation, tenderness, pain, lymphedema, hydrocoel, elephantiasis of the limbs and genitalia and chyluria [3]. These clinical complications have serious effect on psychological, social and personal life of the affected individual. Lymphatic filariasis is spread from infected to uninfected persons by night

biting mosquito species of *Culex* and *Anopheles* [4].

The strategy of the global Lymphatic filariasis elimination initiative is based on interruption of infection transmission through annual mass administration of drugs to the entire at-risk population and alleviation of suffering and morbidity through prevention and management of disease manifestation. At present, the Nigerian Lymphatic Filariasis Elimination Programme (NLFEP) of the Federal Ministry of Health with the assistance of Carter Centre has set the year 2015 to eliminate the disease in Nigeria.

Despite the various studies been reported on the prevalence of LF in different parts of Nigeria [5-10], there is need to collate epidemiological baseline data that will assist in proper planning and implementation measures against the infection.

The main objective of this study was to investigate the status of the disease in some rural communities in southern Abia State, Nigeria, with a view to enriching the epidemiological baseline data of the disease in Nigeria. This will be of immense importance in control intervention targeted at the affected communities.

Methods

Study area

A preliminary survey of Lymphatic filariasis caused by *W. bancrofti* was carried out among the Ndoki people of Abia State. Ukwu East L.G.A lies between latitude 4°57'N and longitude 7°29'E [11]. The communities randomly selected for the investigation included Ohambele, Obohia, Azumini, Ohanku, Ohanso, Ohuru, Akirikauku and Akirikanta. Majority of the inhabitants are farmers. The study area is a heavy rain forest region. The climate is tropical and an average daily maximum and minimum temperature of 28°C and 24°C respectively. It has an average rainfall of about 2400 mm and has two seasons in the year. The rainy season this is between March and October and the dry season which is between November and February. The average humidity is 90 % (11). The communities sampled depend mainly on

streams and rivers, such as Imo River and Azumini for their water source. Domestic water is usually stored in clay or earthen pots, buckets and drums which provide conducive breeding sites for mosquitoes.

Ethical consideration

Permission to conduct this survey was obtained from The Ministry of Health, Abia State, Nigeria and the Ukwu East Local Government Public Health Unit before the commencement of the study. Consent was also obtained from the various community rulers (*Eze*) where investigation was carried out. They were duly informed of the nature, scope and purpose of the study. All the pains and inconveniences to be encountered in the course of blood collection were explained to the subjects. Participation of individuals was voluntary.

Sample collection

The sample for the study was drawn from household selected through systematic sampling with random start, selecting every alternate household. Each selected household was considered a sampling unit. The participants from the various communities were mobilized by the respective community Heads to assembly in their respective Health centre between 2300 and 0300 hours. A total of 498 finger prick blood samples were collected from the eight communities between February and September, 2012.

Parasitological examination

Giemsa stained thick blood smear was used for the identification of microfilariae under a light microscope. Microfilariae of *W. bancrofti* were identified as sheathed microfilaria without caudal nuclei [12].

Clinical examination

Trained medical personnel recruited for this study examined all the 498 persons for clinical manifestation of Lymphatic filariasis.

Statistical analysis

The differences in the distribution of bancroftianfilariasis among the different communities and age groups were determined using the analysis of variance (ANOVA). The prevalence of infection between sexes, and age was determined by Chi-square test. All data were analyzed using SPSS for Windows version 16.0 (SPSS Inc. Chicago, IL).

Results

A total of 498 Ndoki people of Abia State were examined for Lymphatic filariasis due to *W. bancrofti*. Of the 498 persons examined, 111 (22.3 %) were infected. Infection rates of lymphatic filariasis ranged from 7.04 % in Ohuru community to 43.1 % in Azumini community (Table 1). Distribution of the disease between communities showed a significant variation (Chi-square test, $P<0.05$).

The age differential in the distribution of the disease is seen in Table 2. There was a gradual increase with respect to age reaching a peak in the 31-40 year old age group before a gradual decline in prevalence. Chi-square test showed that age and infection were dependent ($P < 0.05$).

Table 3 showed that out of 498 persons sampled, 277 males and 221 females, the infection rate of males and females were 73 (26.4%) and 38 (17.2%) respectively. It was statistically significant ($P< 0.05$)

Occupational-related prevalence is shown in Table 4. Infection showed to be more prevalent among farmers/ fishermen (34.7 %, $N=124$). There was a significant difference in infection ($P < 0.05$).

Clinical manifestation due to *W. bancrofti* in the various communities indicated that 20.9% showed microfilaraemia while 1.4% manifested lymphedema (Table 5).

Table1: Community prevalence of Bancroftian filariasis in Ukwa East L.G.A, Abia State, Nigeria

Communities	Total number examined	Number (%) with microfilari
Ohambebe	57	15 (26.3)
Obohia	63	12 (19.1)
Azumini	65	28 (43.1)
Ohanku	61	24 (39.3)
Ohanso	58	7 (12.1)
Ohuru	71	5 (7.0)
AkirikaUku	60	12 (20.0)
Akirikanta	63	8 (12.7)
Total	498	111 (22.3)

Table 2: Prevalence of Bancroftian filariasis in relation to age amongst the Ndoki people, Ukwa East

Age (Years)	number examined	Number (%) Positive for microfilariae
0-10	58	2 (3.5)
11-20	789 (11.5)	
21-30	7231 (43.1)	
31-40	7038 (54.3)	
41-50	6519(29.3)	
51-60	688(11.8)	
61-70	44	3 (6.8)
71 +	43	1 (2.4)
Total	498	111 (22.3)

Table 3: Occupational related prevalence of Bancroftian filariasis in Ukwa East L.G.A, Abia State

Occupation	No examined	No infected
Civil servants	82	23 (28.1)
Traders	64	4 (6.3)
Students	100	22 (22.0)
House wives	91	17 (18.7)
Farmers	124	43 (34.7)
Artisans	37	2 (5.4)

Table 4: Occupational related prevalence of Bancroftian filariasis in Ukwia East L.G.A, Abia State

Community	Population	Population sampled (%)	Microfilaraemia +ves	Lymphoedema +ves
Ohambebe	1250	57 (4.56)	14 (14.0)	1 (12.3)
Obohia	1305	63 (4.8)	12 (19.1)	0 (0.0)
Azumini	1300	65 (5.0)	26 (40.0)	2 (3.1)
Ohanku	1215	61 (5.0)	24 (39.3)	0 (0.0)
Ohanso	1125	58 (5.2)	7 (12.1)	0 (0.0)
Ohuru	1048	71 (6.8)	4 (5.6)	1 (1.4)
AkirikaUku	1054	60 (5.7)	11 (18.3)	1 (1.7)
Akirikanta	1234	63 (5.1)	6 (9.5)	2 (3.2)
Total	10,746	498 (4.6)	104 (20.9)	7 (1.4)

Table 5: Prevalence (%) and Clinical manifestation due to *W. bancrofti* in the study area

Community	Population	Population sampled (%)	Microfilaraemia +ves	Lymphoedema +ves
Ohambebe	1250	57 (4.56)	14 (14.0)	1 (12.3)
Obohia	1305	63 (4.8)	12 (19.1)	0 (0.0)
Azumini	1300	65 (5.0)	26 (40.0)	2 (3.1)
Ohanku	1215	61 (5.0)	24 (39.3)	0 (0.0)
Ohanso	1125	58 (5.2)	7 (12.1)	0 (0.0)
Ohuru	1048	71 (6.8)	4 (5.6)	1 (1.4)
AkirikaUku	1054	60 (5.7)	11 (18.3)	1 (1.7)
Akirikanta	1234	63 (5.1)	6 (9.5)	2 (3.2)
Total	10,746	498 (4.6)	104 (20.9)	7 (1.4)

Discussion

This preliminary survey of lymphatic filariasis due to *W. bancrofti* amongst the Ndoki people of Abia State, Nigeria revealed an overall prevalence of 111 (22.3 %). This is similar with the result obtained by [13] in Malumfashi district of Northern Nigeria. Lower prevalence's were found in other studies of lymphatic filariasis due to *W. bancrofti* in Nigeria. Studies by [19] reported 16.9 % among the Ezza people of Ebonyi State, 15.5 % reported by [8] among Mbembe people of Cross River State, (5), observed 18.8 % in Aguata Local Government Area of Anambra State and 6.5 % recorded by [14] in Benue State. From the present study, the high prevalence rate of infection recorded could not be unconnected with the fact that the study communities are rural areas. The presence of stagnant waters, bushes and shrubs

which were close to living homes provided conducive breeding sites for proliferation of mosquitoes which subsequently increased the chances of the spread of the disease cases within the study area. Most of the houses in the study area were not properly infected thus permitting the movement of the mosquito vector in and out of the houses [15]. The absence of pipe-borne water in the study area contributed immensely to exposure (man-vector contact) in the process of water usage from streams and rivers. The age-related prevalence is in accordance with the work of [16,17, 18]. The high prevalence recorded in 31-40 years age group might be attributed to intense occupational activities such as farming and fishing being carried out by people in this age group. However, it is of major concern to the Ndoki people because this age range are known to be the most productive age. This study showed a significantly higher prevalence of lymphatic filariasis due to *W. bancrofti* infection in males than females. This is in accordance with most reports in other parts of Nigeria [19]. This pattern of prevalence observed may be in conjunction with the fact that males are often involved in outdoor activities such as farming, fishing and other occupation that predisposes them to frequent contact with the vector. Exposure to filarial causing mosquitoes, tends to increase the rate of infection. Occupational related prevalence was observed to be statistically different. Farmers and fishermen in the study area were observed to be more infected with the infection. This is basically a function of their daily contact with the vector in the course of their work activity. The nature of farming brings them in close proximity to the Anopheles mosquito insect vectors of the disease. Azumini community was observed to have the highest microfilaraemia manifestation. This is attributed to the numerous water bodies that served as breeding grounds for the vector, hence a potential source of infection. Clinical manifestation observed in the study population was microfilaraemia (20.4 %) and lymphedema (1.4 %). Other investigators had reported these manifestations as the cause of disability and disfigurement in an endemic area

[17,20,21,22]. Hydrocele, an important clinical manifestation of lymphatic filariasis was observed in the study (1.4 %). This is similar to the report of [8,15] both in Cross River State, Nigeria.

With respect to the active transmission of Lymphatic filariasis due to *W. bancrofti* in the study area, there is dire need for proper awareness, sensitization and interruption of infection transmission through mass drug administration. A comprehensive epidemiological entomological study is however advocated for better and effective control.

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Conclusion

The data obtained in this present work has provided a baseline data for government at all levels to intensify effort at tackling the disease in the study areas so as to alleviate the suffering of the people.

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