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Wuchereria bancrofti infection in rural tropical guinea-savannah communities: Rapid epidemiological assessment using immunochromatographic card test and prevalence of hydrocoele

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Abstract. Lymphatic filariasis (LF) caused by the nematode *Wuchereria bancrofti* is a major public health concern in endemic communities worldwide. Among tropical diseases it is second to malaria in terms of disability adjusted life years. The Nigerian LF elimination programme has been slated for 2015. Currently, there is paucity of published data on the problem in rural Ebonyi State. This survey was conducted in six rural communities of southwestern Ebonyi State to assess its prevalence among the population and provide baseline data for incorporation into the national LF elimination programme. Immunochromatographic card test (ICT) for detecting circulating filarial antigen (CFA) using whole blood and overt clinical manifestations (lymphoedema and hydrocoele) were used as epidemiological tools. All the studied communities were endemic for active bancroftian filariasis. Of the 600 randomly selected subjects aged ≥10 years, an overall prevalence of 23.50% was established (range, 17.00 - 30.00%). Overall, the antigenaemic prevalence was similar; there was a trend of slightly higher prevalence in males (24.34%) than females (22.39%). The between-gender prevalence difference was not statistically significant (χ^2 = 8.16, df = 1, p = 0.05) based on CFA positivity. Antigenaemia prevalence was age-dependent, increased exponentially and peaked at 20.57% in subjects in the 40-49 years age category. Lymphoedema and hydrocoele attributable to *W. bancrofti* were observed in 4.05% of subjects examined. Generally, hydrocoele was observed in 1.69% males, whereas lymphoedema was presented by 2.36% (1.35% females; 1.01% males) of studied population. None of the male subjects had both the two clinical features. Results of this study showed that *W. bancrofti* infection is widespread in southwestern Ebonyi State, Nigeria, and is a major health issue. There is a need for mass mobilization, mass education and community involvement in sustained intervention programme toward lymphatic filariasis elimination.

INTRODUCTION

Lymphatic filariasis (LF) caused by the nematode parasite *Wuchereria bancrofti* is a major disabling filarial disease of public health importance. *Wuchereria bancrofti* is transmitted to man by infected female mosquitoes belonging to the genera *Culex*, *Anopheles*, *Aedes* and *Mansonia* by injecting infective larvae (microfilariae) during a blood meal into the circulating system (Park, 2007). The acute disease is characterized by inflammation of the lymph nodes (lymphadenitis) and lymph ducts (lymphangitis) while the chronic stages include hydrocoele (enlargement of the

scrotum), lymphoedema and elephantiasis of the extremities and genitals, chyluria and recurrent infections associated with lymphatics (Park, 2007). An estimated 120 million people are infected in 83 countries (WHO, 2002). In sub-Saharan Africa, 512 million individuals are estimated to be at risk of LF infection while 28 million others are already infected, representing about 40% of the global population of 70 million infected people (WHO, 2002). Populations at risk of contracting the infection are primarily poor and majority of cases are concentrated in rural communities although urban transmission has been reported (Blackburn & Terranella, 2006). The disease is responsible for suffering, deformity and disability to the chronically affected persons and also exerts considerable social and economic impacts in endemic countries (Raviglione *et al.*, 1995). Although mortality from LF is low, the disease is the fourth leading cause of permanent disability and among the tropical diseases is second only to malaria in terms of disability-adjusted life years (WHO, 2002).

Over the years, significant progress has been made in Nigeria in lymphatic filariasis research. In the south-south and south-east forest geopolitical zones, prevalent rates of 12.8% and 8.7% respectively have been established in study areas (Udonsi, 1986; 1988). In parts of savannah belt of north central Nigeria, prevalent rates ranging from 6.5% to 29.2% have also been reported (Badaki & Akogun, 2001; Targema *et al.*, 2008). Other studies have also shown that LF is endemic and widely distributed in Nigeria (Nwoke *et al.*, 1999; Braide *et al.*, 2003; Nwoke *et al.*, 2006). The global alliance to eliminate LF as a public health problem by 2020 was established in 2000 (Ottesen, 2000). The Nigerian lymphatic filariasis elimination programme has set 2015 as the year to eliminate it in the country. To achieve the goal of this programme, an initial assessment of the disease situation is needed in order to identify populations in need of mass treatment and health education programme. Parasitological examination of LF is difficult and invasive because it requires collection of night blood samples. This technique is particularly problematic in many endemic African communities with strong religious and superstitious beliefs (Braide *et al.*, 2003). Circulating filarial antigen testing therefore became the recognized method of choice for the detection of *W. bancfrofti* infection and can be performed with whole blood collected during the day or night.

Ebonyi is one of the youngest Nigerian states created in 1996 and lies within the guinea savannah vegetation transition belt between savannah of the north-central and the forest belt of the south-south and south-east geopolitical zones. Apart from the epidemiological survey of LF among the Ezza people of central Ebonyi State (Anosike *et al.*, 2005), there is a dearth of published data on the disease status in other parts of the state. Our current study was aimed at determining the prevalence of active *W. bancrofti* infection among inhabitants of two local government areas known to be endemic for onchocerciasis (Okoro *et al.*, 2014), using immunochromatographic whole blood card test. The choice of the study area was further based on positive feedbacks of our preliminary survey on the presence of overt hydrocoele and elephantiasis among the inhabitants. It is envisaged that our findings would provide additional baseline data on the distribution of the infection which could be integrated into the state and national LF elimination programme.

MATERIAL AND METHODS

Study area and demography

Ebonyi State is one of the 36 states constituting the Federal Republic of Nigeria. It is also one of the 5 states of the southeast geopolitical zone of the country. Currently, the state consists of 13 administrative local government areas (LGAs) with Abakaliki as the capital. The state is located between the coordinates $5^{o}45^{1}$ and $6^{o}50^{1}$ N, $7^{o}50^{1}$ and $8^{o}30^{1}$ E and covers an area of about 31, 024 km^2 with a population of over 2.1 million people (NPC, 2007). It is ethnically homogeneous with male to female ratio of 1:1 (NPC, 2007).

Ebonyi south senatorial zone comprises of 10 autonomous communities, *viz* Okposi,

Uburu and Ugwulangwu (constituting Ohaozara L.G.A.); Isu, Onicha, Oshiri, and Ukawu (Onicha LGA); Akaeze and Ishiagu (Ivo LGA). The study was conducted in Ohaozara and Onicha LGAs from March through July 2010. Topographically, the land is gently undulating and the vegetation is of the guinea-savannah mosaic type with large expanse of semiforested land punctuated by widely scattered hills (Ofomata & Phil-Eze, 2001). The study communities are criss-crossed by tributaries of the Asu and Ata rivers which constitute all season major sources of water required for swamp rice farming. Agriculture is the dominant occupation of the inhabitants most of whom live in widely dispersed village settlements. The annual rainfall is 190 mm and relative humidity 75.0±5%, – factors which provide favourable conditions for the breeding of various species of mosquitoes some of which are associated with the transmission of *W. bancrofti*. The six studied villages had an estimated population of 1,684 (NPC, 2007) and each village had one primary school and a primary health centre.

Study design and ethical clearance

The cross-sectional study was designed to assess the status of *W. bancrofti* infection through sensitization, mobilization of the study communities and sample collection. Prior to the commencement of the survey, advocacy visits were made to the state Ministry of Health (MOH), Primary Health Care (PHC) units in the LGAs, traditional rulers and village heads for permission and to express the importance of the study. Disease surveillance officers and the local onchocerciasis control unit coordinators in each LGA were interviewed on the prevalence of hydrocoele and lymphoedema in the communities. The most endemic communities of Okposi, Uburu, Ugwulangwu (Ohaozara LGA); Oshiri, Onicha, Isu (Onicha LGA) were purposively selected. The coordinators of the various Development Centres (DC) acted as guides and mobilized the villagers to assemble at designated PHC on specific dates. Criteria for participation included residence in the area for at least 10 years and age of not less than 10 years. The study was approved by the Ethical Review Board of the Department of Zoology and Environmental Biology, University of Nigeria, Nsukka and Ebonyi State Ministry of Health. Verbal informed consent of every individual participating in the survey was obtained before collection of blood samples. In cases of children, informed consent was obtained from the parents or guardians.

Data collection

Sample size calculation was based on the concept of statistical power (Ottesen, 2000). Communities were identified purposively and households were systematically selected from a sampling frame. Within each household every member aged ≥10 years was recruited. Sample population size of 1350 individuals (755 males; 595 females) was pooled from Okposi (238), Uburu (210), Ugwulangwu (220), Isu (230), Onicha (232), and Oshiri (220). Demographic characteristics of age, sex, occupation, occurrence of lymphoedema and hydrocoele (for men) were recorded for each participant in the format designed for the study.

A total of 600 subjects (100 from each community) were randomly selected from each community using table of random numbers for the immunochromatographic card test (ICT). An ICT for circulating filarial antigen (RFA) (NOW Filariasis Binar Inc. Portland ME. USA) of *W. bancrofti* using whole blood was performed using standard protocol (Weil *et al.*, 1997). Briefly, whole blood samples obtained from the subjects using sterile lancet finger pulp punctures were collected in heparinized 100 microlitres (µl) capillary tubes from the 600 participants screened. For each participant, the blood sample was gently applied on the pad on the ICT kit properly soaked, after which the card was firmly closed and time noted. After 15 minutes (not beyond this time) the results were read from the card in accordance with set guidelines (Rajgor *et al.*, 2002). A positive test indicated active infection with *W. bancrofti*.

Principle of ICT

The NOW ICT Filariasis uses a polyclonal antibody (Pab) in the sample pad. The Pab is

attached to colloidal gold (pink colour). A monoclonal antibody (Mab) specific for *W. bancrofti* is impregnated in a line across the strip above the test pad. Any *W. bancrofti* antigen present binds to the colloidal gold-labelled antibody. When the card is closed, antigen joined to the colloidal gold-labelled antibody travels along the strip. When the Mab line is reached, the antigen-antibody complex binds to (is captured by) the monoclonal antibody, forming a pink line in the viewing window. A positive control is included which is seen as a pink colour above the test, indicating that the reagents have migrated satisfactorily.

Hydrocoele and lymphoedema survey

Hydrocoele was defined as an enlargement of the scrotum as a result of excess liquid inside the sac around the testicles. Male subjects were recorded as having hydrocoele when the fluid collection was observed to be on one or both sides of the scrotum and the skin of the scrotum was normal (thin and soft). Assessment of lymphoedema involved overt features such as swellings, skin folds and knob (Park, 2007). Many enrolled individuals withdrew from the studies for various reasons including fear of contracting the human immunodeficiency virus (HIV), failed to respond or moved out of the study area. A total of 888 individuals (including the 600 persons screened for CFA) were selected from the sample population of 1350 and examined for overt clinical manifestations (elephantiasis of limbs, breast and scrotum) due to *W. bancrofti* by the team physician. Clinical history of any degree of swelling of hands, legs, scrotum qualified individual for examination.

Data analysis

Data collected were analyzed for significance using Epi Info (Version 16) software statistical package. Two-way ANOVA was used to test for significance difference in prevalence between age groups and sexes in each community. Chi square (χ^2) was also used to test for independence of infection with antigenaemia on communities, age group and sexes. Communities were considered endemic if at least one individual had a positive ICT result for *W. bancrofti* antigen.

RESULTS

Table 1 summarizes the community and sex related prevalence of antigenaemia among the study population of southwestern Ebonyi state. Out of the 600 subjects (341 males; 259 females) screened for blood circulating filarial antigen (CFA), 141 individuals were antigenaemia positive providing an overall CFA prevalence of 23.50%. All the studied communities were endemic for active *W. bancrofti* infection to varying degrees as indicated by the observed presence of CFA in the peripheral blood of >20% of screened subjects. Intercommunity *antigenaemia*

Table 1. Community and gender-related prevalence of *Wuchereria bancrofti* antigenaemia in two local government areas of Ebonyi State, Nigeria

Local government area	Community	Male		Female		Total	
		Number examined	Number (%) positive	Number examined	Number (%) positive	Number examined	Number (%) positive
Ohaozara	Okposi	57	12(14.46)	43	5(8.62)	100	17(17.00)
	Uburu	46	8(9.64)	54	13(22.41)	100	21(21.00)
	Ugwulangwu	62	17(20.48)	38	9(15.52)	100	26(26.00)
Onicha	Isu	54	14(16.87)	46	16(27.59)	100	30(30.00)
	Onicha	64	13(15.66)	36	6(10.34)	100	19(19.00)
	Oshiri	58	19(22.89)	42	9(15.52)	100	28(28.00)
	Total	341	83(24.34)	259	58(22.39)	600	141(23.50)

prevalence ranged from 17.00% in Okposi community (Ohaozara LGA) to 30.00% in Isu community (Onicha LGA). Generally, communities in Onicha LGA recorded higher CFA prevalence (range, 19.00%–30.00%) than those from Ohaozara LGA (range, 17.00%–26.00%) although the intercommunity antigenaemia prevalence difference was not significant (χ^2=9.81, df=5, P=0.08) indicating that *W. bancrofti* infection was not localized. The trend of slightly higher antigenaemic prevalence in males (24.34%) than females (22.39%) was not statistically significant (χ^2=8.16, df=1, p=0.05) indicating that antigenaemia distribution in the studied population was not gender bias.

The age and sex related distribution of circulating filarial antigens among infected individuals in southwestern Ebonyi state is shown in Table 2. Self-declared ages of the participants ranged from 10 to 75 years. Generally, antigenaemia prevalence among the infected subjects (83 males; 58 females) was age-dependent, increased exponentially from 14.18% among subjects aged 10–19 years, peaked at 20.57% among individuals in the 40–49 years age category, then declined to 13.48% in the >60 years age group. The observed between-age prevalence difference was statistically significant (p<0.05) showing that *W. bancrofti* filariasis is an age-dependent infection. Chi square independent test for association between CFA prevalence and sex showed that antigenaemia prevalence is independent of sex (p>0.05) implying that the infection is not sex-biased.

The community and gender associated prevalence of lymphoedema and hydrocoele in study communities of southwestern Ebonyi state is shown in Table 3. Lymphoedema (of the legs) and hydrocoele (of the scrotum) were the most common overt clinical manifestations observed among the study population. Overall, lymphoedema and hydrocoele (attributed to *W. bancrofti* infection) were diagnosed in 4.05% of the 888 individuals examined. While 15 males (1.69%) of the studied population presented with hydrocoele, 2.36% (comprising 9 males and 12 females) showed varying degrees of lymphoedema of the legs. The highest (5.30%) and lowest (3.05%) community specific prevalence of lymphoedema and hydrocoele were recorded in Ugwulangwu and Oshiri communities, respectively. Overall, more males (5.17%) than females (2.83%) presented with overt clinical features of *W. bancrofti* infection in the studied communities.

The age and gender related prevalence of hydrocoele and lymphoedema among the studied population is summarized in Table 4. Data from the physical examinations indicated that the prevalence of the two overt features is age-dependent. Generally, prevalence rates increased with increasing age, reached a peak (6.67%) among subjects in the 50–59 years age category, and declined

Table 2. Age and sex specific prevalence of circulating filarial antigen in southwestern Ebonyi State, Nigeria

Age group (years)	Male		Female		Total	
	Number examined	Number (%) positive	Number examined	Number (%) positive	Number examined	Number (%) positive
10-19	62	14(16.87)	58	6(10.34)	120	20(14.18)
20-29	68	13(15.66)	60	10(17.24)	128	23(16.31)
30-39	60	15(18.07)	62	12(20.69)	122	27(19.15)
40-49	62	16(19.28)	46	13(22.41)	108	29(20.57)
50-59	53	13(15.66)	24	10(17.24)	77	23(16.31)
≥ 60	36	12(14.46)	9	7(12.07)	45	19(13.48)
	341	83(24.34)	259	58(22.39)	600	141(23.50)

to 4.65% among persons ≥60 years. The variability of hydrocoele and lymphoedema with age had over 50% coefficient of variation (Table 5). None of the male subjects had both clinical features (hydrocoele and lymphoedema) and individuals with either hydrocoele or lymphoedema were CFA negative. Overall, 3.23% of total males examined (n=464) presented with hydrocoele while 1.94% (n=9) showed lymphoedema of the legs. More females (2.83%) than males (1.94%) presented with varying stages of lymphoedema attributable to *W. bancrofti* infection.

No subject in the age category 10–20 years presented with clinical symptoms/ signs except one girl (aged 17 years) found with elephantiasis of the left leg.

DISCUSSION

The study was conducted in southwestern Ebonyi state, Nigeria to provide a rapid epidemiological baseline data to those managing and monitoring the on-going lymphatic filariasis elimination programme in Nigeria under the Global Programme for Elimination of Lymphatic Filariasis (GPELF). This highly needed epidemiological information is currently scarce in Ebonyi State where majority of people live in remote rural communities in association with lymphatic filariasis-vector-risk environment. The occupation of the rural dwellers, which is generally agrarian, predisposes them to high human- *W. bancrofti* vector contact.

Table 3. Community and gender related prevalence of lymphoedema and hydrocoele in southwestern Ebonyi State, Nigeria

Community	Number examined		Number (%) with lymphoedema	Number (%) with hydrocoele	Total (%) with lymphoedema and hydrocoele
Okposi	Male	86	3(3.49)	2(2.33)	5(5.81)
	Female	70	1(1.43)	–	1(1.43)
	Total	156	4(2.56)	2(1.28)	6(3.85)
Uburu	Male	72	1(1.39)	2(2.78)	3(4.17)
	Female	64	2(3.13)	–	2(3.13)
	Total	136	3(2.21)	2(1.47)	5(3.68)
Ugwulangwu	Male	78	1(1.28)	5(6.41)	6(7.69)
	Female	73	2(2.74)	–	2(2.74)
	Total	151	3(1.99)	5(3.31)	8(5.30)
Isu	Male	88	2(2.27)	3(3.41)	5(5.68)
	Female	72	3(4.17)	–	3(4.17)
	Total	160	5(3.13)	3(1.88)	8(5.00)
Onicha	Male	73	2(2.74)	2(2.74)	4(5.48)
	Female	81	1(1.23)	–	1(1.23
	Total	154	3(1.95)	2(1.30)	5(3.25)
Oshiri	Male	67	0(0.00)	1(1.49)	1(1.49)
	Female	64	3(4.69)	–	3(4.69)
	Total	131	3(2.29)	1(0.76)	4(3.05)
Total	Male	464	9(1.94)	15(3.23)	24(5.17)
	Female	424	12(2.83)	–	12(2.83)
	Total	888	21(2.36)	15(1.69)	36(4.05)

Table 4. Age and gender related prevalence of lymphoedema and hydrocoele in southwestern Ebonyi State, Nigeria

Age group (years)	Number examined		Number (%) with lymphoedema	Number (%) with hydrocoele	Total (%) with lymphoedema and hydrocoele
10 – 19	Male	27	0(0.00)	0(0.00)	0(0.00)
	Female	20	1(5.00)	–	
	Total	47	1(2.13)	0(0.00)	1(2.13)
20 – 29	Male	51	1(1.96)	1(1.96)	
	Female	38	1(2.63)	–	
	Total	89	2(2.25)	1(1.12)	3(3.37)
30 – 39	Male	101	2(1.98)	2(1.98)	
	Female	119	3(2.52)	–	
	Total	220	5(2.27)	2(0.91)	7 (3.18)
40 – 49	Male	131	2(1.53)	5(3.82)	
	Female	122	2(1.64)	–	
	Total	253	4(1.58)	5(1.98)	9(3.56)
50 – 59	Male	79	2(2.53)	4(5.06)	
	Female	71	4(5.63)	–	
	Total	150	6(4.00)	4(4.00)	10(6.67)
≥ 60	Male	75	2(2.67)	3(4.00)	
	Female	54	1(1.85)	–	
	Total	129	3(2.33)	3(2.33)	6(4.65)
Total	Male	464	9(1.94)	15(3.23)	
	Female	424	12(2.83)	–	
	Total	888	21(2.36)	15(1.69)	36(4.05)

Table 5. Variability of lymphoedema and hydrocoele with age in the studied population of Ebonyi State, Nigeria

Overt clinical features	Number of observations	Mean ($\ddot{x}$)	Standard deviation (sd)	Coefficient of variation	
				sd/ ($\ddot{x}$)	%
Hydrocoele	6	2.5	1.38	0.55	55
Lymphoedema	6	3.5	1.87	0.53	53

The results of this study show that *W. bancrofti* infection is prevalent in the rural tropical guinea-savannah communities of Ebonyi State, Nigeria. The results confirmed the endemicity of the infection as reported for Ebonyi State by earlier studies (Ottesen, 2000), and in other parts of Nigeria (Udonsi, 1988; Braide *et al.*, 2003; Eigege *et al.*, 2003; Omudu & Okafor, 2007), and elsewhere in Africa (Ivoke, 2000; Melrose & Rahmah, 2006; Braga *et al.*, 2008). The mean prevalence of *W. bancrofti* antigenaemia recorded in our study was lower than that recorded for the Ezza people of Ebonyi State (Anosike *et al.*, 2005). It is also lower than results from other parts of Nigeria (Richards *et al.*, 2005;

Blackburn & Terranella, 2006). However, results similar to that of our present observations have been reported in different parts of the world (Akogun, 1992; Huang *et al.*, 1998; Ivoke, 2000; Njenga *et al.*, 2007). The result of our observation may be ascribed partly to the cumulative effect of continuous exposure to the mosquito vector species that transmit *W. bancrofti*.

The similar antigenaemic prevalent rate recorded for males (24.34%) and females (22.39%) was in agreement with Anosike *et al.* (2005) who reported equal prevalence rates in both sexes. Equal rates of circulating filarial antigen prevalence in both sexes were also reported by other researchers who noted that both sexes were equally exposed to mosquito bites and other risk factors in a given locality (Udonsi, 1988; Eigege *et al.*, 2003; Braga *et al.*, 2008). The similar antigenaemic prevalence in males and females inherent in the current study is indicative that females were more prone to infection based on the fact that significantly greater number of males than females was tested. The relatively greater male turn out reflects the substantial impact exerted on both sexes by the social stigma associated with *W. bancrofti* infection and the resulting disease. The community antigenaemia prevalence recorded in the study indicated that, overall, less than 40% of the participants from each study community were antigenaemia-positive (range, 17–30%). This outcome could be attributed partly to the effect of the community-directed distribution of ivermectin against onchocerciasis in the study areas by the state Ministry of Health (Anosike *et al.*, 2005), and partly due to the ability of substantial proportion of study population to mount effective immune response against *W. bancrofti* antigens.

Results of the study also revealed that gender-associated prevalence of circulating filarial antigen is age-dependent. This result is consistent with those of other investigators in Nigeria (Mukoko *et al.*, 2004; Anosike *et al.*, 2005), and other parts of Africa (Pani *et al.*, 1991; Akogun, 1992). The situation could be attributed to the cumulative effect of the residual antigens due to increased contact of older individuals with mosquito vectors as a result of prolonged exposure during out door activities. The observed decline in circulating filarial antigen prevalence in individuals ≥60 years could be as a result of reduced exposure due to declining outdoor activity in this age category.

The study further established that the prevalence of overt clinical manifestation of *W. bancrofti* infection is also age-dependent. Previous studies in Nigeria and elsewhere had demonstrated that, generally, older individuals presented with lymphoedema and hydrocoele and not the younger ones (Eberhard *et al.*, 1993; Nwoke *et al.*, 2006; Omudu & Okafor, 2007). The chronic overt features of the infection appear later in life as a result of increased exposure to mosquito vector with increasing age and gradual accumulation of infection (Eberhard *et al.*, 1993). In this study, a girl of 17 years presented with fourth-grade lymphoedema of the left leg which could be attributed to infection of *W. bancrofti* acquired in early years of life. This observation contrasted with that of other researchers who reported the possibility of congenital antigenaemia in Haitian subjects (Addiss, 1995).

In comparing the prevalence of antigenaemia and overt clinical features, it was observed that all individuals with overt clinical manifestations (lymphoedema and hydrocoele) tested negative according to ICT results. In Nigeria, a statistically significant correlation of hydrocoele and ICT prevalence has been reported (Eigege *et al.*, 2003), and similar observations were made by investigators elsewhere (Addiss, 1995). Some studies evaluating the whole blood ICT test in the fluid have been performed and the sensitivity and specificity were found to be high (Njenga *et al.*, 2007; Braga *et al.*, 2008). This study also revealed that there was strong positive correlation between lymphoedema and hydrocoele prevalence. This result is in agreement with the results of studies on lymphatic filariasis in Benue State, Nigeria. Comparison of hydrocoele and lymphoedema as indicators for community diagnosis of *W. bancrofti* infection had shown that hydrocoele is a more useful indicator than

lymphoedema (Badaki & Akogun, 2001). It has been established by researchers that lymphoedema prevalence predominates over hydrocoele in Nigeria (Braide *et al.*, 2003). The present study did not establish any significant difference in prevalence of both disease states. Although some researchers (Nwoke *et al.*, 2006) had recommended the use of hydrocoele only as a rapid diagnostic method for community *W. bancrofti* infection, the result of this study suggest that search for both lymphoedema and hydrocoele be utilized as tools to assess the community prevalence and hence LF elimination programme since the method does not require finger prick.

In conclusion, the present study has established that *W. bancrofti* infection is endemic and that active transmission is widespread in rural communities of southwestern Ebonyi State. The study also highlighted the correlation between the overt clinical features (lymphoedema and hydrocoele) as rapid indicators of community surveillance of the infection. It is suggested that both features be integrated in the assessment of the performance of LF elimination programme. The variability of lymphoedema and hydrocoele with age as indicated by the coefficient of variation of over 50% supports the use of both overt clinical features in rapid community diagnosis. Furthermore, mass mobilization measures with emphasis on community health education and participation be mounted and sustained in endemic communities. In relation with the requirements for the Global Elimination of Lymphatic Filariasis (GELF), it is recommended that epidemiological mapping of the State followed by mass chemotherapy be implemented.

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