



Lymphatic filariasis and associated morbidities in rural communities of Ogun State, Southwestern Nigeria



Okonofua Christiana^{a,b}, Morenikeji Olajumoke^{b,*},
Salawu Oyetunde^{b,c}

^a Department of Biological Sciences, Crawford University, Igbesa, Ogun State, Nigeria

^b Parasitology Research Unit, Department of Zoology, University of Ibadan, Ibadan, Oyo, Nigeria

^c Department of Biosciences and Biotechnology, Babcock University, Ilishan-Remo, Nigeria

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Summary Lymphatic filariasis caused by *Wuchereria bancrofti* is a serious public health problem in rural communities of Nigeria. The study assessed the prevalence of lymphatic filariasis and associated clinical morbidities in Ado-Odo Ota Local Government Area of Ogun State. Microscopic examination of thick blood smears of 500 participants of both sexes and age ranging from 1 to 79 years was conducted. Visual observations of clinical manifestations of chronic infection were also conducted. The overall prevalence and intensity of infection were 21% and 21.4 mf/mL of blood respectively. Microfilaraemic prevalence was significantly higher in males (27.1%) than in females (16%) ($P < 0.001$). However, intensity of infection was not gender and age dependent ($P > 0.05$). The overall prevalence of all clinical manifestations of infection due to *W. bancrofti* is 15% with hydrocele, limb and breast elephantiasis constituting 16.9%, 4.6% and 5.1% of the total population respectively. Prevalence of hydrocele and limb elephantiasis was significantly higher in the older age groups ($P < 0.05$). Occurrence of elephantiasis of the breast in women however was not associated with age ($P > 0.05$). Integrated approach through chemotherapy and vector control is therefore advocated to reduce morbidity due to infection in this study area.

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Introduction

Lymphatic filariasis is a major cause of acute and chronic morbidity in humans living in the tropics.¹ The disease is

caused by infection with the parasitic worm *Wuchereria bancrofti* in Africa (*Brugia malayi* and *Brugia timori* in Asia-Pacific) and is transmitted by *Anopheles*, *Culex*, *Aedes* and *Mansoni* mosquitoes.^{2,3} Over 120 million people in at least

* Corresponding author. Tel.: +234 8055275915.

E-mail addresses: jumokemorenikeji@yahoo.co.uk, zootund@yahoo.com (M. Olajumoke).

80 countries of the world are infected with lymphatic filariasis and it is estimated that 1.2 billion (20% of the world population) are at risk of acquiring the infection.^{4,5}

In the last decade, Nigeria was rated the second most endemic country worldwide and also with the largest population at risk of infection in the African continent for lymphatic filariasis worldwide.⁶ Filarial infections have been reported in the coastal and rain-forest zones of Nigeria.^{7–9} Many of the studies carried out in Nigeria have reported infection rates which are far above the WHO recommended 1% threshold necessary for initiation of mass treatment.^{10,11}

Lymphatic filariasis is characterized by a wide range of clinical presentations including acute and chronic manifestations¹² with about 40 million incapacitated and disfigured by morbid grotesque manifestations of the disease known as lymphedema and hydrocele.¹³ Studies on rapid assessment of chronic manifestations of lymphatic filariasis in Kano¹⁴ and Taraba state in Nigeria¹⁵ indicated that hydrocele and lymphedema of the lower limbs were the most common morbid manifestations. A similar study conducted in Ogun state revealed similar results,¹⁶ however, the study and others in Nigeria did not closely consider the risk factors of the disease. The disease although rarely fatal, it causes permanent long-term disability, gross disfigurement and untold suffering for millions. Unfortunately despite these indicators of filariasis in the country, and the existence of a National Lymphatic Filariasis Program, very little work has been done and documented on lymphatic filariasis in Nigeria. This study therefore aims to give a systematic and detailed assessment of the extent and impact of the disease on the subject population in order to provide baseline information for control program.

Methods

Study areas

The study was carried out in Ado-Odo Ota Local Government Area of Ogun State. The local government is located within the tropical zone, lying between 6°47'N of the equator and 2°53'E and 3°18'E of the Greenwich Meridian covering a land area of 1263 km². It has a terrain of 1010.4 km² plane land and about 252.6 km² bad terrains comprising of 10% riverine and 4% hilly regions. The 2006 Nigerian National Census showed that the population size was about 526,565.

Census and mapping

Prior to commencement of the study, meetings were held in the study areas and selected sections of the towns to explain the purpose and procedures of the study. Three communities (Ado I, Ado II and Eri) out of the total of seven in the Local Government Area were randomly selected for the study. The three communities comprised those randomly selected out of paper wraps containing the names of the seven localities in the Local Government Area. The towns are well demarcated into sections by a network of streets. Participants were drawn from every 5th house systematically selected from each section. All household

members of the selected houses were included in the study. All the selected subjects from the three communities were recruited at the local government health center through the help of the communities' health workers. The subjects constituted the usual residents i.e. indigenes and non-indigenes who have resided in the area for at least one year. All individuals aged one year or more were eligible to participate in the clinical and parasitological surveys.

Sample size determination and parasitological survey

No previous study on lymphatic filariasis has been conducted in the study areas. A prevalence of 17% was assumed based on previous report in Ogun state, Nigeria.¹⁶ The precision 5% (0.05) is most suitable for such prevalence¹⁷ and a minimum sample size of 217 subjects was calculated using the method described by Naing et al.¹⁷ A total of 500 participants in all were recruited for the exercise.

Blood sampling for parasitological examination took place in the night between 21:00 and 02:00. A thick blood film was prepared from finger prick blood drawn into a heparinized capillary tube (60 µL) and then stained with Giemsa. Microscopic examination of slides was done. Microfilariae were identified based on the specific morphological features described by Cheesbrough.¹⁸ The prevalence of microfilaraemia was determined and the intensity of infection was expressed as mf/mL.

Clinical examination

A clinic was set up at the communities' local government health center. The eligible individuals presented themselves to the clinic during daytime, and were examined for evidence of symptoms and signs of lymphatic filariasis. Chronic involvement of the genitalia in males and of the limbs in both sexes were examined.¹⁹ In the case of male genital involvement, swelling of the spermatic cord was graded as hydrocele stage I, and true hydroceles were graded as stage II (6–10 cm in length), stage III (11–15 cm), or stage IV (>15 cm). Leg elephantiasis was graded as stage I (early pitting edema), stage II (non-pitting edema with thickened skin and loss of elasticity), or stage III (evident elephantiasis with skin folds and/or warty lesions) (Fig. 1).

Questionnaire administration

A pretested and structured questionnaire was administered to obtain information on the subjects' demographic data (age, sex, education, occupation e.t.c), history of fever and control of the disease.

Ethical clearance

The University of Ibadan/University College Hospital (UI/UCH) Ethical Review Board and Ado-Odo Ota Local Government Area health authorities gave approval for the study. Informed consent to participate was obtained from those aged ≥15 years and from the parents of children younger than 15 years.

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