



USING CLINICAL SIGNS TO DETERMINE THE ENDEMICITY LEVEL OF LYMPHATIC FILARIASIS IN AFIKPO NORTH L.G.A. EBONYI STATE, NIGERIA

Ngele Kalu Kalu¹, A. A. A. Alaribe² & O. T. Shoniron³

¹Biology/Biotechnology Department, Federal University Ndufu Alike Ikwo, Ebonyi State

²Medical Laboratory Science Department, (Medical Microbiology/Parasitology Unit), University Of Calabar

³Science Laboratory Technology Department, Akanu Ibiam Federal Polytechnic Unwana, Ebonyi State

ABSTRACT

Seven hundred and eighty one (781) subjects from thirty (30) villages in Afikpo North L.G.A., Ebonyi State, Nigeria were examined clinically for the physical signs of lymphatic filariasis. The medical centres in the area were used. Trained medical doctors were used in diagnosing for hydrocoeles, hanging groin, elephantiasis (lymphoedema) *etc.* Hydrocoeles and lymphoedema were the commonest clinical signs of lymphatic filariasis detected during the survey. The prevalence of hydrocoeles was found to be 8.23%. Hydrocoele was more frequent among the older people 53years and above, than the younger ones below the age of 27years. The prevalence of lymphoedema was 8.88%. Males were more affected with the prevalence rate of 5.55% than females 3.33%. From the study, the subjects affected with lymphoedema and hydrocoeles were not involved in active village activities like clearing of the roads, paying of their levies and even taking care of their immediate families because they were no more engaged with active work, due to serious morbidity caused by the infection *Wuchereria bancrofti* on the subjects, which leads to the manifestation of hydrocoeles and lymphoedema. With these results, Afikpo North is said to be endemic with lymphatic filariasis, and should be included by the National Lymphatic Filariasis Elimination/Control Programmes as one of the areas to be controlled and eliminated with the disease (Lymphatic filariasis).

KEYWORDS: *Lymphatic filariasis, lymphoedema, hydrocoeles.*

INTRODUCTION

More than 100 million individuals worldwide are estimated to suffer from lymphatic filariasis (LF) caused by infection with the mosquito-borne filarial nematode *Wuchereria bancrofti* (WHO, 1994). The infection induces sub-clinical abnormalities in the lymphatic system, which ultimately may result into the development of the overt clinical manifestations such as lymphoedema, elephantiasis, or hydrocoele (Ottesen, 1994; WHO, 1994). Lymphatic filariasis has been identified as the second leading cause of permanent and long-term disability and a major contributor to poverty in the world (Ottesen, 1994; WHO, 2003). In Africa, lymphatic filariasis is mostly caused by *Wuchereria bancrofti* and it is mostly transmitted to man through the bites of a female *Anopheles* mosquito. Humans are the definitive hosts for *Wuchereria bancrofti*. There is no animal reservoir (Ottesen *et al.*, 1997). Other species of filarial worms that may be associated with lymphatic filariasis are *Brugia malayi* and *Brugia timori* (WHO, 1994). The most important vectors for the transmission of *W. bancrofti* infection are *Anopheles gambiae sensu stricto*, *Anopheles funestus*, *Culex quinquefasciatus*, *Aedes polynesiensis*, *Aedes scapularis*, *Aedes pseudoscutellaris* and *Mansonia uniformis* (Service, 1979; Hunter *et al.*, 1976; Cheesbrough, 2002). In sub-saharan Africa, it is estimated that 28 million people are infected with lymphatic filariasis (LF), 512 million people are at risk (Anon, 1993; WHO, 2003). About 44million people are affected with

lymphoedema, genital pathology and elephantiasis, while about 76 million people have parasites in their blood with hidden internal damages in their lymphatic and renal systems (Ottesen *et al.*, 1997). Elephantiasis appears to be the most commonly recognized manifestation of lymphatic filariasis though acute adenolymphangitis (ADL) and hydrocoele that affect a much larger proportion of the people in endemic villages are hidden but cause a great deal of suffering (Gyapony *et al.*, 1996). Elephantiasis usually affects the lower limbs and the arms in both males and females, and the male genital (mainly the scrotum but sometimes the penis as well) and also the females' breast and genitals including the vulva are mostly affected (Ottesen, 1994). Hydrocoele is more common than elephantiasis and in some villages; its prevalence can be as high as 40% of the adult male population (Gyapony *et al.*, 1998). Development of the most dreaded chronic manifestation of lymphatic filariasis, lymphoedema and elephantiasis are associated with the recurrent episodes of acute adenolymphangitis (ADL) with fever and malaria (Ottesen, 1994). Adenolymphangitis appears to result from the human immune response to parasite products released by dead or dying adult worms and as a result of bacterial super-infection (Ottesen, 1994; Gyapong *et al.*, 1996; Taylor, *et al.*, 2001; Punksody *et al.*, 2003).

MATERIALS & METHODS

Study area

The study was carried out in 30 villages in Afikpo North Local Government Area of Ebonyi State, Nigeria. The

villages are Ezi Egwu, Amangwu, Amasiri, Unwana, Akpoha, Ezinnali, Ibii, Amaechara, Mgbom, Amangbala, Amaobolobo, Amauzu, Ukpa, Amachi, Ngodo and Enohia Nkalu. Others include Kpogirikpo, Amaorie, Amaikpo, Enohia Itim, Amaukwu, Amankwo, Ugwuegu, Oti-Village, Ogudu Amuku, Itim Ukwu, Ezi-Nwachi, Amaizu, Amoha, and Amuro. Afikpo is located between latitudes 5°4' N and 6°3' N and longitudes 7° 5' E and 7°55'E. There are two main seasons in this area that is rainy season which is between April – October and dry season which lasts between November – March. The annual rainfall is about 160mm – 220mm with maximum precipitation occurring between July and September. The temperature ranges between 23.4°C and 29.9°C. The relative humidity is between 60 – 80% (Iloeje, 1981; NPC 2006). Afikpo is bounded in the North by Ohaozara L.G.A. of Ebonyi State. By the East by Afikpo South L.G.A. Afikpo is bounded in the South by Cross River State and also in the West by Abia State (Iloeje, 1981; NPC, 2006). According to the 2006 National Census, the population of Afikpo people is about 672,000 persons. The area is hilly with undulating plains. The people are predominantly farmers producing rice, cassava, yam, vegetable, palm oil, cocoyam, etc. They are also fishermen, hunters and a good number of them deal on timbers. These outdoor activities may predispose them to mosquito bites, which transmits the microfilariae of *W. bancrofti*, the causative agent of lymphatic filariasis. Afikpo people have nucleated settlements. Most of the houses have mud walls and thatched roofs. The waste water from the households helps to create breeding sites for the mosquito vector. Some houses are also not protected with mosquito nets, so as to disallow the entry of insects especially mosquitoes (Ottemberge, 1962).

Mobilization of the villagers/ ethical consideration

Ethical approval before the commencement of the study was sought from the Director of Public Health in the state Ministry of Health and the Chairman of Afikpo North Local Government Area. With the permission obtained, the village leaders were met and briefed on the importance and the rationale of the study, which pass the information to the members of their villages. Some indigenes of the villages were recruited to help in reaching out to their people, for convenience purposes. The health centres in the various villages were used as rallying points for the volunteer members (subjects) of the different villages to reduce the inconvenience of having to move from house to house with all the equipment/ materials needed for the investigation and to give everyone an equal chance of being attended to.

Study population

The study population for the clinical and parasitological examinations included subjects between the ages of 18 years and above both males and females who presented themselves for examinations at the medical centers to check for the physical signs of the disease such as hydrocoele and lymphoedema of the arms, legs, genital organs, breasts etc. Seven hundred and eighty one (781) subjects were examined.

Clinical examination of participations

Participants who came to the medical centers in response to the announcements were first of all documented, their

demographic data such as name, age, occupation and duration of stay in the locality obtained. They were also given consent forms to complete; they were then made to undergo clinical examinations by the Resident Clinician in the Health Center for the evidence of lymphatic filariasis infections among others. Such clinical manifestations like genital enlargement (hydrocoeles), lymphoedema of the breast and elephantiasis of the legs were looked for. Few health centres were found in the study areas. The people were meant to gather at the nearest health center nearest to them. The “ogo” the common meeting place of the people were equally used. The grading of lymphoedema is based on the WHO grading system of lymphoedema (Gerusa *et al.*, 2002). Lymphoedema is graded in stages, ranging from stage 1 to stage 7. Each of the stages has its own characteristics.

Stage 1 lymphoedema; (Swelling is reversible, it disappears overnight): The swelling increases during the day and disappears overnight when the patient lies flat on bed.

Stage 2 lymphoedema; the main difference between stage 2 lymphoedema and stage 1 is that the swelling does not disappear without lymphoedema management. (Gerusa *et al.*, 2002).

Stage 3 lymphoedema; the principal feature of stage 3 lymphoedema is the presence of one or more shallow skin folds. Shallow folds can be seen when the patient moves the leg or foot so that the fold opens up.

Stage 4 characterized with Knobs: The main features of stage 4 lymphoedema is the presence of Knobs. Knobs are bumps, humps or protrusions of the skin.

Stage 5 characterized with Deep skin folds: The presence of one or more deep skin folds is the main feature of stage 5 lymphoedema.

Stage 6 characterized by ‘Mossy’ lesions: On the surface of the skin (especially the upper surface of the toes), very small elongated or rounded small growths may develop. They are usually clustered together, giving rise to the peculiar appearance of ‘mossy lesions’.

Stage 7 characteristic feature: Unable to care for self or perform daily activities. The patient is unable to adequately or independently perform routine daily activities such as walking, bathing, or cooking etc. Patients with stage 7 lymphoedema have frequent acute attacks and large legs, usually with deep folds. They always have entry lesions between the toes and skin folds. The bad odour is very strong. Wounds in the skin are commonly present, which can encourage secondary infections (Wolbachia) with bacteria and fungi infections.

Measuring tape was used in measuring the sizes of the hydrocoeles according to WHO recommendations (Gerusa, *et al.*, 2002; WHO, 2002).

Statistical analysis

Pie charts were used to represent the prevalence of hydrocoele among the subjects. Tables were equally used in representing the prevalence of lymphoedema and hydrocoeles in the study.

RESULTS

Different sizes of hydrocoeles found in Afikpo North L. G. A.

Table 1 shows sizes of hydrocoeles found in Afikpo North L.G.A., according to village, age range and occupation.

Unwana village had the highest number of subjects with hydrocoeles. They were nine (9) positive cases of hydrocoeles ranging from 18cm – 22cm. Hydrocoeles found from the study areas ranges from 10cm – 25cm in size. Hydrocoeles affect subjects of different occupations. Hydrocoeles affect the older people than the younger people. Subjects within the age bracket 83 – 87 years had the highest percentage prevalence (25.00%) while subjects within the age group 23 – 27 years had the lowest percentage prevalence (3.23%). Overall prevalence of hydrocoeles was (8.23%). Fig. 1 shows the pie chart representing the percentage positive of hydrocoeles found in Afikpo North L.G.A. Hydrocoele affects subjects of different age groups.

Different stages of lymphoedema found in Afikpo North L. G. A.

Table 2 shows the different stages of lymphoedema found in Afikpo North L.G.A., among both sexes. Eight positive

cases of lymphoedema were observed in Afikpo North L.G.A. Unwana village had the highest cases (4 positive cases). The individuals were mainly subjects from 53 years and above and they were mainly farmers. Males were more affected with lymphoedema than females. There were five positive cases of males while females had three positive cases. The stages of lymphoedema ranged from stage three (3) to stage four (4). Subjects within the age group 78 – 82 years females, had the highest prevalence 20.00%, while subjects within the age brackets 53 – 57 years males had the least prevalence 3.22%. However, no positive case was recorded among females within the same age group (53-57 years). Males generally had a higher prevalence of 5.55% while females had a lower prevalence of 3.33%. Overall prevalence of lymphoedema of 8.88% was recorded in both sexes in Afikpo North LGA.

TABLE 1: Sizes of hydrocoele found in Afikpo North L.G.A.

| Villages | Age Range | No. examined | No. positive (%) | Occupation | Sizes of hydro-coeles in cm per positive case |
|--------------|-----------|--------------|------------------|-------------|---|
| Amaizu | 73-77 | 13 | 2 (15.38) | Farmers | 25, 23 |
| Amaizu | 53-57 | 40 | 2 (5.00) | Farmers | 18, 20 |
| Unwana | 43-47 | 33 | 3 (9.09) | Traders | 18, 20, 21 |
| Unwana | 48-52 | 34 | 3 (8.84) | Traders | 18, 19, 22 |
| Unwana | 73-77 | 13 | 3 (23.07) | Farmers | 19, 22, 22 |
| Mgbom | 23-27 | 31 | 1 (3.23) | Student | 10 |
| Kpogirikpo | 78-82 | 10 | 2 (20.00) | Farmers | 22, 19 |
| Kpogirikpo | 58-62 | 23 | 2 (8.69) | Farmers | 20, 22 |
| Ibii | 28-32 | 40 | 2 (5.00) | Students | 12, 14 |
| Ibii | 78-82 | 10 | 2 (20.00) | Farmers | 23, 21 |
| Enohia Nkalu | 63-67 | 20 | 2 (10.00) | Farmers | 19, 20 |
| Enohia Nkalu | 23-27 | 40 | 2 (3.23) | Students | 10, 11 |
| Ezinwanchi | 73-77 | 13 | 1 (7.69) | Farmer | 14 |
| Ugwuegu | 68-72 | 15 | 1 (6.66) | Farmer | 18 |
| Amuro | 73-77 | 13 | 1 (7.69) | Fish farmer | 21 |
| Amaorie | 83-87 | 8 | 2 (25.00) | Farmers | 20, 25 |
| Amaorie | 53-57 | 31 | 2 (6.45) | Farmers | 18, 19 |
| Amangballa | 73-77 | 13 | 1 (7.69) | Farmer | 20 |
| Amaobolobo | 68-72 | 15 | 1 (6.66) | Farmer | 15 |
| Amaechara | 78-82 | 10 | 1 (10.66) | Farmer | 18 |
| Total | | 425 | 36 (8.23) | | |

TABLE 2: Lymphoedema and their different stages observed in Afikpo North LGA among both sexes

| Village | Age range | No. examined | No. Positive | Occupation | No of Male positive % | No of Female positive % | Stage |
|------------|-----------|--------------|--------------|-------------|-----------------------|-------------------------|-------|
| Unwana | 78-82 | 10 | 2 | Farmer | 0 (00) | 2 (20.00) | 3, 2 |
| Unwana | 73-77 | 13 | 2 | Farmer | 1 (7.69) | 1 (7.69) | 3, 4 |
| Mgbom | 78-82 | 10 | 1 | Fish farmer | 1 (10.00) | 0 (0.00) | 3 |
| Kpogirikpo | 73-77 | 13 | 1 | Farmer | 1 (7.69) | 0 (0.00) | 3 |
| Amaizu | 73-77 | 13 | 1 | Farmer | 1 (7.69) | 0 (0.00) | 4 |
| Amangballa | 53-57 | 31 | 1 | Trader | 1 (3.23) | 0 (0.00) | |
| Total | | 90 | 8(8.88) | | 5 (5.55) | 3 (3.33) | |

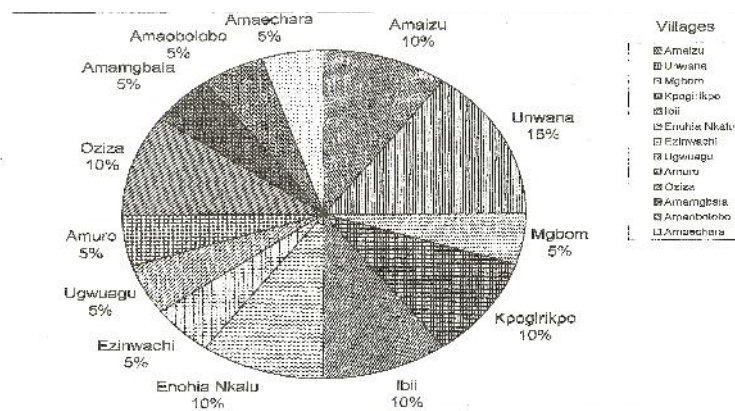


Fig 4.1 Prevalence of lymphatic filariasis in Afikpo North LGA by observation of hydrocoeleles

FIGURE 1: Prevalence of lymphatic filariasis in Afikpo North LGA by observation of hydrocoeleles

DISCUSSION

The prevalence of Hydrocoeleles (8.23%) was observed in Afikpo North L.G.A., the presence of hydrocoele cuts across subjects of different age groups. Subjects within the age bracket 83-87 years had the highest percentage prevalence of 25.00%, while subjects within the age brackets 23-27 years had the least prevalence of hydrocoeleles (3.23%) amongst the positive cases. The sizes of the hydrocoeleles differ within the age groups. Subjects within the age bracket 83-87 years had bigger sizes of hydrocoeleles 25cm at maximum while subjects within the age bracket 23-27 years had less sizes of hydrocoeleles of 10cm, who were invariably younger. Dunyo *et al.*, (1996) established a higher hydrocoele prevalence of 21.8% in Pemba Island, Tanzania. Onapa *et al.*, (2001) working in Uganda; Udonsi and Odey (1985) working in Niger Delta Regions of Nigeria also established higher prevalences of hydrocoeleles of 28.0% and 17.8% respectively. Udonsi (1986 and 1988) also recorded a prevalence of 12.7% hydrocoeleles among adult males in Igwun River Basin of Abia State, Nigeria. Ufomadu and Ekejindu (1992) and Targema *et al.*, (2008), recorded lower hydrocoele prevalence of 1.8% and 2.3% in Plateau and Benue States, Nigeria respectively. Poverty is a major handicap in Afikpo North LGA, so the people find it difficult to go to hospital for surgical operation owing to the high cost of money involved in the surgical operation of the hydrocoeleles. Eigege *et al.*, (2002) established a hydrocoele prevalence of 12.2% and 43.3% in Plateau and Nasarawa States respectively. Ibanga (2002) found low hydrocoele prevalence of 0.74% in Obanliku, Cross River State, Nigeria.

A prevalence of 8.88% lymphoedema was found in Afikpo North L.G.A. Pendersen *et al.*, (1999) recorded lower prevalence of 1.4% lymphoedema (elephantiasis) in Pemba Island, Tanzania. Dunyo *et al.*, (1996); Onapa *et al.*, (2001) had similar findings of 8.6%, 9.0% prevalence of lymphoedema in Ghana and Uganda respectively, which is similar to the 8.88% prevalence of lymphoedema established in Afikpo North L.G.A., Ebonyi State, Nigeria. Udonsi (1986) recorded a higher prevalence of 15.9% in Igwun River Basin of Abia State, Nigeria. Low level of income among the people and also constant exposure to

the bite of infected mosquito vectors contributed to the high prevalence of lymphoedema in Afikpo North L.G.A.

SUMMARY & CONCLUSION

Different stages of lymphoedema were observed in Afikpo North LGA. Eight positive cases were observed and recorded. Males were more affected than females. Prevalence of lymphoedema was highest among subjects within the age bracket 78-82 years, (20.00%) while subjects within 53-57 years had the least prevalence of hydrocoeleles (3.22%). However, from the study carried out, lymphatic filariasis exists in Afikpo North L.G.A., and should be included in the WHO map as one of the areas to be eliminated with the disease lymphatic filariasis.

RECOMMENDATIONS

The following recommendations are made:

1. Afikpo North LGA should be included in the list and map of WHO, as one of the areas for the control and elimination of lymphatic filariasis in line with the WHO resolution of eliminating lymphatic filariasis by the year 2020.
2. Health education methods (awareness campaign programme) should be employed which can help to break through the walls of suspicion and supernatural beliefs from locality to locality, on the cause of lymphatic filariasis, if prevention and control programmes are to make any impact in the rural areas.
3. There should be mass treatment of the people using the combination therapy of albendazole and mectizan in eradicating both the adult worm using albendazole and the microfilariae using mectizan.
4. The people should be encouraged to use insecticide treated nets, ordinary nets and insecticides in controlling the mosquito vectors.
5. General cleanliness of their environments should be encouraged to destroy the breeding sites of the mosquito vectors. That is, by cutting down grasses around them, and by destroying stagnat water around their environments.

Integrated control method is highly recommended, if employed, will yield better results.

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