

An Investigation of Onchocerciasis Disease in Ebonyi State, Nigeria: Implications for Community Health Counseling Programs

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Abstract

Despite the control programme mounted in 1997 by the African Programme on Onchocerciasis Control (APOC) in collaboration with Ebonyi State Government, the disease still persists. The main purpose of the study was to examine the prevalence of Onchocerciasis disease in Ebonyi State. The survey research design was used to carry out the study. A multi-stage sampling procedure was applied using a structured questionnaire to elicit information from 22934 respondents aged 10 years and above. Most of the affected respondents have Nodules 36.2% and blindness affects the least 2.5%. Other symptomatic distributions of Onchocerciasis disease are as follows: Rashes/itching 29.5%, Leopard skin 19.3%, Lizard skin 16.7% and Ocular lesion/visual impairment 11.4%. The results showed an overall Onchocerciasis rate of 19.3%. Nodules 36.2% was the commonest sign and symptom of Onchocerciasis disease in the study area. Community health counselling programs should be created, intensifying and targeting efforts to promote feasible and cost-effective preventive measures against the transmission of Onchocerciasis disease in Ebonyi State.

Keywords: Onchocerciasis, Ebonyi State, Community Health; Counselling

INTRODUCTION

Onchocerciasis, or river blindness is an illness caused by infection with the filarial worm, *Onchocerciasis volvulus*.^[1-3] Its symptoms include severe itching, scratching, jolting, swelling on the skin, and loss of sight.^[3-7] The disease causing agent is a dark fly of the species *Simulium damnosum* and *Simulium bovis* which is biggest in the developing regions like Nigeria.^[3,47] The disease is mostly spread near riverside, streams, swampy and moist or damp environments where the disease agents breed. The disease is transmitted through vectors mostly infected blackflies.^[7,6] People living around damp and rivers or stream always suffer from Onchocerciasis.^[6] Given that the land is good for agriculture, the inhabitants get effected with the illness. In most cases, female black flies ingest microfilariae into the human body. Later, the microfilariae grow to be in human organs (e.g. skins, ear, eyes).^[7,6] Microfilariae are then transmitted to the next human host during subsequent bites.^[7,6]

The African Programme on Onchocerciasis Control investigation at Ebonyi state found that many Ebonyians continue to be blinded by the disease. Ebonyi, created in 1996, is one of the youngest Nigerian states and has a high prevalence of onchocerciasis as revealed by the epidemiological survey of Lymphatic Filariasis (LF) among the Ezza people of Ebonyi central.⁸ These scholars maintained that there is a dearth of published data on the disease status in other parts of the state; although information from relevant agencies such as Ministry of Health (MOH), Primary Health Care (PHC) units in the LGAs, control unit coordinators, traditional rulers and village heads among others, also revealed that Ebonyi state has carriers of onchocerciasis. The most endemic communities are Okposi, Uburu, Ugwulangwu (Ohaozara LGA); Oshiri, Onicha, Isu (Onicha LGA), Umuhala, Nkalagu, (Ishielu LGA) and Onuebonyi, Nkaliki (Abakaliki LGA) among other areas. Despite governmental and non-governmental efforts in establishing special eye clinics in strategic places in Ebonyi state, construction of modern water supply systems and provision of medical treatment to affected persons, the disease has remained endemic. Measures to treat local rivers have not been considered, leaving many Ebonyians at risk of blindness. Relevant information regarding the implications of using contaminated rivers as water sources in Ebonyi state has not been given to her citizens. A statement by some community leaders in 2013 noted that the government should come to their aid before blindness engulfs their communities. Mbanefo et al. noted that many people in southeastern Nigeria are still ignorant of the dangerous effects or causes of onchocerciasis⁹. This informs the need for accelerated public enlightenment campaign especially in the endemic communities and areas prone to vector infestation. The high prevalence of onchocerciasis in Ebonyi state may be due to the fact that Ebonyi has fertile land for agriculture. Akimbo and Okaka report that onchocerciasis is an endemic disease in Nigeria, accounting for 40% of the global disease burden¹⁰. The authors further noted that seven endemic states still exist in Nigeria namely: Ebonyi, Abia, Anambra, Delta among others. This was also in line with WHO and APOC estimations of Nigeria state populations living with blindness caused by onchocerciasis.^[11,12]

According to WHO, onchocerciasis constitutes a huge public health and socioeconomic burden in many parts of tropical

Africa.^[13] WHO confirmed that Onchocerciasis is most prevalent in Africa, where more than 99% of infected people live in 31 countries in sub Saharan Africa: Angola, Benin, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Republic of the Congo, Equatorial Guinea, Ethiopia, Gabon, Ghana, Guinea, GuineaBissau, Kenya, Liberia, Malawi, Mali, Mozambique, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Sudan, Sudan, Togo, Uganda, and United Republic of Tanzania.^[14] It has also been found in Yemen. Ikpo, Mbanugo, Anukwuorji and Ugwuanyi reported that in Nigeria, the infection is exclusively transmitted by members of the *Simulium damnosum* species, which are widespread in the savanna, forest savanna mosaic and forest areas of the country.^[15] Onchocerciasis occurs in Nigeria with greater frequency than any other country worldwide and accounts for 40% of all cases of onchocerciasis in Africa.¹⁰ According to APOC, in all the countries of the world, Nigeria has the greatest number of persons with onchocerciasis.^[16] Nigeria also has more people blinded by onchocerciasis than any other country, an estimated 100,000 cases out of the 268,000 that occur worldwide. The population of Nigerians blinded by onchocerciasis exceeded that of all 11 countries covered by the Onchocerciasis Control Programme (OCP). Thirty one out of the existing thirty six states of Nigeria and the Federal Capital Territory have meso- to hyper-endemic foci for onchocerciasis. Out of the 774 Local Government Areas in Nigeria, about 416 are rated high priority for onchocerciasis control.^[15] The prevalence of onchocerciasis has also been established in different parts of Nigeria by different scholars including.^[17-21] Its rate of occurrence varied by geographical area with high number people recorded in Edo State to about 54.2% in Ibarapa LGA of Oyo State.^[10] The evidence from these studies showed that *Onchocerca microfilariae* is a significant issue in Nigeria.

Okonkwo, et al. conducted an epidemiological study on human onchocerciasis in Ebonyi state comprising 213 male and 187 female farmers ages 20 and above.^[20] The authors found that one hundred and fifty (33.3%) farmers were infected with *Onchocerciasis volvulus* of whom 100 (38.0%) were males and 50 (26.7%) were females. The highest infection rate of 55.3% (n=37) was found in participants aged 50 years and above whereas the lowest infection rate of 15.5% was found in people aged 20 - 29 years (n=17). Nineteen per cent (n=19) of infected males and 6% (n=3) of infected females had skin disease due to onchocerciasis, partial blindness was recorded in 6% (n=6) of males and 9% (n=3) of females, 64% (n=64) of males and 40% (n=20) of females had mild blindness while absolute loss of sight was observed in 4% (n=4) of males and 4% (n=2) of females. This study provided evidence that cases of Onchocerciasis are prevalent in Ebonyi state. According to Uzoegwu and Aloh, the role played by river proximity is supported by findings that differences in prevalence rates of onchocerciasis obtained by different diagnostic methods showed inverse relationships with the respective distances of the communities around riversides, which serves as a breeding areas.^[22] Ebonyi state is in close proximity to the fast flowing rivers Esu and Ebonyi, which are tributaries of other rivers in the region. It could be assumed that cases of onchocerciasis is a function of population and closeness to disease agents (vectors).^[23]

A health summit was organized in Nigeria in 1995 with the view for an urgent change in the health system and health status of the country. The Federal Ministry of Health (FMOH) responded to the summit and organized a review of health policy in 1996-1997. The policy was hinged upon the health strategy of New Partnership for African Development (NEPAD), MDGs, economic empowerment development strategies and health sector reforms based on the principle of social justice, equity, and freedom as indicated in the 1999 constitution of Nigeria. Against this background was ancillary policies aimed at supporting sustainable health reforms in Nigeria. The underlying aim was to strengthen health system to provide efficient, quality, affordable and accessible healthcare services that will improve the health status of Nigerians with the achievement of the health related Millennium Development Goals (MDGs). The major participants in the National Health Policy include National Health System and Management, National Health Care Resources, National Health Interventions, National Health Information System, Research and National Health Care Laws. These bodies were introduced at the state level in order to prevent or eradicate onchocerciasis but the disease has continued to increase in Ebonyi state and beyond.

MATERIALS AND METHODS

This study is part of a cross-sectional survey conceived by the first author. The study was reviewed and approved by the Department of Human Kinetic and Health Education, Nnamdi Azikiwe University, Awka, Nigeria. This study was done in accordance with the Helsinki declaration. The research was conducted in Ebonyi State. Indigenes of Ebonyi State are mainly farmers, fishermen and a few business men/government workers. Ebonyi State has two large rivers - Ebonyi and Esu with fast flowing water and boulders that encourage the breeding of the simulium fly. The researchers used the cross-sectional research design. The available population of this study was 1,247,658 people drawn from 56% of Ebonyi State projected population of 2,427,349 in 2011.^[7] The respondents who are people above 10 years were examined based on the following variables: age, and gender. The entire State is categorized into three Health zones with a population distribution of people aged 10 years and above as follows: Abakaliki zone – 421,086 persons, Onueke zone – 421,000 persons and Afikpo zone – 405,572 people. The sample size for this study was 3987. To determine the sample size for this study, the Yamene's formula was used. The instrument for data collection was a self-structured questionnaire that consists of sections A and B. Section A contains 4 items on personal data of the respondents. Section B contains 6 items to determine the number of people suffering from onchocerciasis disease based on the signs and symptoms. The face and content validity of this instrument was checked by five experts in Human Kinetics and Health Education, and one Medical Consultant. The reliability of the instrument was established through Split-Half method based on 60 selected households. The split-half test was used to avoid the effect of knowledge on the response of the later subjects. Spearman's correlation coefficient reliability of .71 was obtained. The researchers and their assistants

administered the questionnaire to all the households of those areas covered by the study. Twenty research assistants were duly trained for 3 hours over 10 consecutive days and were employed for the study. The training involved explanation of the content of the questionnaire and the mode of responses to the assistants. The instrument was administered to the 3987 respondents on face-to-face basis. The researchers and assistants were available to explain any point which the respondents did not understand. All the 3987 copies of the questionnaire were filled and returned. Entry into the households was made through the households' heads by either the researchers or the research assistants. Thereafter, every member of each household within the selected 27 villages that was 10 years and above entered in the study. The returned copies of the questionnaires were cross-checked for completeness of responses. Copies of the questionnaire that had incomplete responses were discarded. Out of the 3987 copies of the questionnaire distributed, 3789 representing about 95% return rate, was used for data analysis. Data were analyzed using percentages which enabled the researcher to gain average scores on prevalence of onchocerciasis.

RESULTS AND DISCUSSION

Our findings focused on the prevalence rate of onchocerciasis disease according to six listed signs and symptoms (Nodules, Rashes/itching, Leopard skin, Lizard skin, Ocular lesion/visual impairment and Blindness due to onchocerciasis disease). Most of the affected respondents have Nodules 36.2% and blindness affects the least 2.5%. Other symptomatic distribution of onchocerciasis disease is as follows: Rashes/itching 29.5%, Leopard skin 19.3%, Lizard skin 16.7% and Ocular lesion/visual impairment 11.4%. Overall rate of onchocerciasis disease was 19.3%. Respondents who fall within the age group 50-59 years are mostly (43.6%) affected by onchocerciasis disease. This age group is followed closely by respondents aged between 40-49 years. Respondents aged 20-29 years have the least number of people suffering from onchocerciasis disease 2.9% as shown in Table 2. Other age groups are as follows 10-19 6.6%, 30-39 15.5%, 60-69 3.4% and those aged 70 years and above 3.1%. The above results imply that the age groups mostly affected (43.6%) are respondents aged 50-59 years. The figure compares favorably with the prevalence recorded in previous studies. Our findings of at least 36% infected seems to be much higher than the Dozie study^[24] The result is lower when compared with 47.5% overall prevalence recorded by Wogu and Okaka in a study conducted at Okpuje, Owan West Local Government Area Edo State, Nigeria to determine the prevalence and socio economic effects of Onchocerciasis disease.¹⁸ This result is still lower again if compared with another study conducted by Uttah which recorded 37% prevalence of Onchocerciasis disease in Imo State, Nigeria.^[38]

Also, the prevalence of Onchocerciasis recorded in this study indicated a low prevalence probably due to previous mass ivermectin treatment in the studied areas. Onchocerciasis prevalence was more in females (10.9%) than in males (9.01%), although the difference was not statistically significant (χ^2 -test, $p > 0.05$). This was supported by the

findings which revealed that females are currently assuming more responsibility than even before and thereby exposes their bodies to both friendly and unfriendly environment.^[18,25-28] This may be of no doubt since females in Ebonyi state were taking faster responsibility in farming than males. This because males only cultivates land while females plants and weed the farmland during raining seasons, in other words the females were exposed to dirty water with a heavy bites of blackflies. Ebonyi State occupies large area of fertile land with fast flowing streams and rivers which provide favourable breeding sites for the simuliid vectors. Therefore, it is not surprising to notice female dominance in agriculture which exposes them to vector bites. The females take active part in harvesting, processing, transportation and selling of farm produce.^[25] In rural families, the males only do cultivation which limit their numbers of been infected by onchocerciasis comparing to numbers of females infected.^[29,30] This finding is however, in disagreement with the report by Akinbo and Okaka in Ovia North East L.G.A of Edo State, Nigeria with 93% onchocerciasis prevalence in females and a corresponding 74.5% in males.^[31] The relationship between man and his environment is symbiotic. Although, it is generally believed that the environment influences human activities, these activities in turn influence the nature of the environment; physical, social and economic factors as very important factors that determine the severity of onchocerciasis in any given society.^[32] This study revealed significant difference (χ^2 -test, $p < 0.05$) between the prevalence of infection and the occupation. This can be supported by Edungbola that onchocerciasis is more common among farmers, fishermen, hunters, nomads and others who are engaged in outdoor activities that bring them in constant contact with the Simulium fly.³³ Human emigrants from endemic areas bringing patent onchocercal infection can influence the community microfilarial loads.^[28] it was found that age-related infection rates had no significant association (χ^2 -test, $p > 0.05$).^[34] However, it is possible that older people may be infected more compared to infection rates among younger population. To that end, earlier studies documented that there is increase in onchocerciasis with respect to age,^[10, 28, 31, 35] which they found that increasing age was associated with stabilizing (plateau) onchocerciasis, possibly as a result of enhanced immunity and reduced exposure. Exposure factors can be held largely responsible for this pattern of infection because the majority of the individuals in the localities studied were farmers and fishermen. Farming exposes people to an on-going risk of Simulium bites and Onchocerca volvulus transmission throughout their lives, irrespective of their age. Despite the prevalence of onchocerciasis in the thirteen local government areas, there still existed wide differences in onchocerciasis prevalence rate.^[28,31,35] This variation could be attributed to differences arising from the frequency, duration and degree of exposure to dirty fast flowing rivers in Ebonyi state which is a manifestation of infected blackflies, the vector of Onchocerca volvulus, possibly imposed by differences in the distances of the communities from the breeding site of the vector. This could probably explain why there was variation in the prevalence of infection in all the Local Governments areas of the state.

The low prevalence can be attributed to mass treatment of people in Ebonyi State with ivermectin (mectizan) through a control programme sponsored/supported by African Programme on Onchocerciasis Control (APOC) for the past fifteen years. The signs and symptoms exhibited by those affected by Onchocerciasis disease in this survey were Nodules 36.2%, Rashes/itching 29.5%, Leopard Skin 19.5%, Ocular lesion/visual impairment 11.4% and Blindness 2.5%. Nodules (36.2%) had the highest score which agrees with previous findings.^[18,36-38] Blindness 2.5% was the lowest score, this agrees with Oyibo, who stated that the blinding strain of Onchocerciasis disease is more within the Savanna belt of Nigeria. Ebonyi falls within the Forest vegetation where this strain is not predominant.^[39] Though a questionnaire, with a written instruction, was used for this study to guide the respondents, the fact that the study was not experimental in which case the researchers or assistants were unable to exert complete control over the responses of the respondents as a result the results may have some marginal errors. Therefore, making generalizations from the findings of the study may not be advised. More research is needed on onchocerciasis which impacts the social, economic and public health burden on the populace and contributes significant stigma upon its sufferers. Research on the psychosocial aspects of onchocerciasis disease is lacking. It implies that community health counsellors are charged to conduct in awareness creation on prevention of onchocerciasis for people living around streams through the intervention of international aids. Community health counsellors should map out counselling strategies and interventions to promote healthy living among people in river sites. The efforts could reduce psychosocial stigma associated with the disease. The implication, however, is that community health counsellors should play roles of social supports services and key local informants in communities with infection rates and vectors-related disease that will aim at rehabilitating both younger and older populations. As a community health problem, there is need for combine efforts including community health counsellors who could collaborate with or support other Non Governmental Organizations in counselling those populations that infected. All in all, counselling on management of the insect-borne diseases is imperative.

CONCLUSION

From the findings in this study, more women were found to be affected by onchocerciasis disease. Women form the bulk of the society, as home makers and managers whatever affects women affects, the husband, children, the family and society at large. Onchocerciasis disease exerts a lot of social and economic burden on the sufferers. The implication is that if more women are affected by onchocerciasis disease as it is the case with this study, the already burdened women out of the enormous responsibilities vested by nature on them will be increased. Women raise the children, keep the home and are involved in occupations especially farming in Ebonyi State. the additional burden of itching, skin disfigurement and the social stigma associated with onchocerciasis disease will not only be a source of distraction but major cause of embarrassment to women thereby leading to low productivity,

reduced income, shame, feeling shy as already confirmed by this study. Again, this study has a lot of implication for public health and medicine. Onchocerciasis disease exerts a lot of pressure on public health. Sufferers encounter reduced productivity which leads to poverty. Poverty and ignorance are the major underlying social causes of diseases generally. Medicine and drugs are produced and procured for the treatment and cure of onchocerciasis disease. Resources in terms of money and manpower are required to manage the onchocerciasis disease. Health Education programmes should be mounted to mitigate the impact of onchocerciasis disease on both women, Public Health and Medicine. Community health counseling programs should be created, intensifying and targeting efforts to promote feasible and cost-effective preventive measures against the transmission of Onchocerciasis disease in Ebonyi State. Other recommendations may include: intensified Community Health Counselling/Education targeted at encouraging preventive measures against onchocerciasis disease transmission and reduction of social stigma against sufferers with identified signs and symptoms of the disease. Counselling people to wear protective clothing; Larvicidal spraying of breeding foci of similium *Damnosium* (black fly); Scaling up of mectizan distribution to ensure more coverage in the control programme; and giving of incentives to Community Health Counsellors, Health Workers and Community Directed Distributors (CDDs)

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