
PREVALENCE, KNOWLEDGE ATTITUDE AND PRACTICES ASSOCIATED WITH ONCHOCERCIASIS IN ENUGU EAST AND NKANU WEST LOCAL GOVERNMENT AREAS OF ENUGU STATE, NIGERIA

OKAFOR, Ogochukwu, UZOKA, Ngozi Blessing, AJUNWA, Linda Oyibo, CHIKEZIE, Ikechukwu Chikezie, IYAM, Orok Iyam and DALLA, Victor Chatcham

Nigerian Institute for Trypanosomiasis Research, South East Zonal Office, Enugu, Enugu State, Nigeria.

Corresponding Author: Okafor, O. Nigerian Institute for Trypanosomiasis Research (NITR), South East Zonal Office, Enugu, Enugu State, Nigeria. **Email:** og_okafor@yahoo.com **Phone:** +234 7061915020

ABSTRACT

Onchocerciasis is still endemic in Enugu East and Nkanu West Local Government Areas of Enugu State. In this survey, the Knowledge, Attitude and Practice (KAP) and prevalence of onchocerciasis were evaluated. For the KAP aspect of this survey, Interviewers administered questionnaire was used as instrument for collecting information from Respondents who participated in the skin snipping exercise. Skin snips were collected for the prevalence survey. A total of 149 persons participated in the prevalence survey out of which 88 participated in the KAP survey. Correct knowledge of causative agent, mode of transmission and treatment of the disease were 21.60%, 21.60%, 22.72% respectively, which is quite low; while vector control and intake of ivermectin were 77.27% and 37.50% respectively. The result of the microscopic analysis of skin snips showed zero prevalence for both communities. However, palpitation exercise conducted just before skin snipping revealed the presence of nodules on some of the participants. Therefore a community based health education intervention on vector control, cause, mode of transmission and treatment of the disease to improved KAP on onchocerciasis as well as confirmatory analysis of skin snips using Polymerase Chain Reaction (PCR) is recommended.

Keywords: Onchocerciasis, *Onchocerca volvulus*, Mode of transmission, Disease treatment, Ivermectin, Knowledge Attitude and Practices (KAP), Skin snips

INTRODUCTION

Onchocerciasis is a chronic parasitic disease caused by the filarial worm, *Onchocerca volvulus*. The disease is transmitted from man to man through the bites of the blackfly *Simulium* of the family *Simuliidae* (Eezzuduemhoi and Wilson, 2013). The disease is increasingly recognized as one of the most endemic diseases in Sub-Saharan Africa, particularly in West Africa. In Nigeria, onchocerciasis is widespread and a cause of blindness in most rural communities (Opara *et al.*, 2008). Onchocerciasis has a focal distribution in Africa,

Yemen and Central America. It is endemic in West Africa, in equatorial and East Africa and in Sudan. One of the largest endemic regions occurs in the Volta River Basin area. About 99% of Onchocerciasis cases occur in Africa and most of these cases occur in Nigeria (Adetokunbo and Herbert, 2003). The disease has been shown to be endemic in Oji Local Government of Enugu State, situated in the rain forest belt of Nigeria (Manafa and Isamah, 2013).

Nigeria has the largest number of persons with onchocerciasis, accounting for about a third of the global prevalence. As one of the largest countries in West Africa, she has

been reported to have a high incidence of onchocerciasis infection with 7 million persons infected with the disease and 40 million at risk. Onchocerciasis, also known as river blindness remains a major cause of blindness with about 270, 000 blinded and approximately half a million persons visually impaired due to the disease (WHOa, 2013). The fear of blindness resulted in depopulation of fertile river valleys, thereby making Onchocerciasis a major obstacle to socio-economic development in the savannah regions of West Africa. The fertility of riverine lands and associated high blindness rate are opposing forces which respectively attract and repel human settlement along fast flowing rivers near vector breeding sites. The opposing forces would account for a relatively high human density in hypo-endemic zones where the advantage of fertile land outweighs the risk of infection (WHO/APOC, 2013).

Although onchocerciasis has existed in Nigeria for centuries, it was not until 1908 that the first report was published. Since then, various authors (WHO, 2013; WHO, 2012; Hoerauf *et al.*, 2003) have contributed to the existing knowledge of its natural endemicity and the socio-economic importance of the disease (Nwoke, 2013). However, a study conducted by Manafa and Isamah, showed knowledge about the cause, prevention and complications of onchocerciasis among members of a community to be low and has resulted in misconceptions about the disease among the people. In developing countries such as Nigeria, there are complex set of beliefs and cultural values associated with health and illness. People's attitude to the cause, clinical manifestation, treatment and various preventive measures of a disease are influenced by their knowledge and perception of their conditions (Manafa *et al.*, 2002).

Taking into cognizance the public health significance of Onchocerciasis, such beliefs and values which affect their knowledge, attitude and practice need to be carefully examined. This will possibly, help to check the effectiveness of the onchocerciasis control programme in the area. This study was therefore carried out to determine the prevalence and KAP on onchocerciasis in the study area and to observe

the relationship pattern between both parameters. This will in turn help to check the effectiveness of and progress towards the sustainability of the Community Directed Treatment with Ivermectin (CDTI) programme.

MATERIALS AND METHODS

Study Areas

Nkanu West and Enugu East Local Government Areas are situated in Enugu State, popularly known as the Coal City State. It is a mainland state in south eastern Nigeria. Its capital is Enugu from which the State created from the old Anambra in 1991 derives its name. It covers an area of 7,161km² and has a population of 5,590,513 (NPC, 2006). The area is predominantly agricultural, with yam tubers, palm produce and rice being their main produce. Nkanu West LGA has its headquarters in the town of Agbani. It has an area of 225 km² and a population of 146,695 from the 2006 census (NPC, 2006). Enugu East has its headquarters in the town of Nkwo Nike. It covers an area of 383 km² and has a population of 279,089 from the 2006 census (Wikipedia, 2013).

Study Design

This study is a prevalence/cross-sectional study. The study was carried out in two phases - the pre-survey and the main survey - in Enugu East and Nkanu West local government areas of Enugu state. Using multistage sampling, Ugwogho Nike and Ndiagu-Akpugo communities were selected from Enugu East and Nkanu West LGAs respectively. Skin snippings were carried out in each community. Also, questionnaires on the knowledge, attitude and practice (KAP) on onchocerciasis were administered by interviewers to respondents in each of the selected communities.

Cross-Sectional Study

Study population: The study population was made up of adult males and females aged

above 5 years who are resident in the study areas.

Data collection method: Data collection for the KAP was done using questionnaires. The questionnaires were interviewer-administered with the help of trained interviewers who were members of the research team as well as trained health workers from the study communities.

Ethical considerations: Ethical clearance was sought from the Ethical Committee of the University of Nigeria Teaching Hospital, Ituku-Ozalla, Enugu State for the KAP study and the Enugu State Ministry of Health. Consent of each participant was sought and obtained verbally after explaining to them the nature and importance of the study.

Pre-survey: The pre-survey visits were made to the two communities chosen for the study. The nature and importance of the survey was explained to the traditional leaders and leaders of the farm settlements. The public health importance of the survey was explained to them and a date was fixed for the survey.

Main survey: In the main survey, participants first presented themselves for palpitation in which the upper parts of their bodies were felt for presence of nodules. Afterwards, skin snips were collected from the left and right iliac crest of each participant twice with the use of corneoscleral punch and placed in the wells (containing normal saline solution) microtitre plates, blood was also collected on filter paper for macroscopic analysis. Each microtitre plate contains 96 wells. Each well was carefully numbered, and a pair of wells was labeled for skin snips taken from the left and right sides of each participant. The microtitre plates were then covered and sealed with transparent tape in order to prevent a spill over during movement. Skin snips were viewed under the microscope, after some hours, for presence of microfilariae. Questionnaires on KAP on onchocerciasis were also administered in both English and Igbo (native dialect) by the research team, assisted by health workers from

the community health centers to those who participated in the skin snipping exercise.

Data Analysis: Skin snips were analyzed using the microscopy. Using micro pipette, part of the saline solution containing skin snip was taken from each well of the microtitre plates and placed on carefully numbered clean slides, covered with cover slips and then viewed under a light microscope at magnifications of x40 and x100. Data collected on KAP from the survey were analyzed manually.

RESULTS

Samples of skin snips were collected from a total of 149 samples were analyzed. The result of samples analyzed showed that all samples analyzed were negative for microfilariae. Thus, the result of the microscopic analysis showed zero prevalence for both communities.

The result of the data analysis showed that out of 88 persons who participated in the KAP survey 16(18.18%) and 17(19.32%) were within the age brackets of 15-24 and 35-44 respectively. Contributions by other age groups were 25 – 34 years 14(15.91%); 45 – 54 years 12(13.64%), 55 – 64 years 14(15.91%) and above 64 years 15(17.04%). The male respondents were 42(47.73%), while the female respondents were 46(52.27%). A total of 40 (45.45%) had primary education; 2(2.27%) had tertiary education while 26(29.55%) were non-educated. Fifty eight respondents representing 68.91% were mostly subsistent farmers, 63(71.60%) were married, while 18(20.45%) were single.

Only 21(24.0%) were aware that onchocerciasis (*isi anya ocha* in Igbo) is a disease and 54(61.40%) claimed that they have not heard of the disease before. A total of 19 persons (21.60%) could identify filarial worm as the causative agent of the disease, while 19(21.60%) of the respondents know that the disease is transmitted through the bite of an infected black fly. Twenty of the respondents representing 22.72% could identify Ivermectin (Mectizan) as the drug of choice for the treatment of the disease.

Moreover, only 27(30.68%) of the respondents claimed that they had at one time or the other participated in the CDTI programme and a smaller number, 33(37.50%), of them have at one time or the other received ivermectin from the Community Directed Distributors (CDDs). However, 50(56.80%) admitted the importance of regular intake of the drug i.e. twice every year for 15 years. About 21(23.86%) claimed that black flies interferes with their occupation and 68(77.27%) claim to control the vector by protecting themselves from the bites of black flies when they go into the bush or near fast flowing streams or rivers. Only 33(37.50%) actually take the drug, ivermectin (Mectizan), but 40(45.45%) claimed to have not missed any dosing round for Mectizan.

Table 1: Demographics of respondents

Characteristics	Number	Frequency %
Age		
15 – 24	16	18.18
25 – 34	14	15.91
35 – 44	17	19.32
45 – 54	12	13.64
55 – 64	14	15.91
Above 64 years	15	17.04
Educational Status		
Non-formal	26	29.55
Primary	40	45.45
Secondary	20	22.73
Tertiary	2	2.27
Sex		
Female	46	52.27
Male	42	47.73
Occupation		
Farming	58	65.91
Civil Servant	1	1.14
Student	12	13.64
Others	9	10.23
None	3	3.40
Trading	5	5.68
Marital Status		
Single	18	20.45
Married	63	71.60
Non response	7	7.95
Total	88	100

DISCUSSION

This study examined the prevalence and KAP on onchocerciasis among residents of Ugwogho

Nike farm settlements Enugu East LGA and Ndiagu-Akpugo in Nkanu West LGA. Majority of the respondents in this study are farmers 58 (65.91%) and their educational status is mostly at the primary school level 40 (45.45%). Observations made from this study revealed that the knowledge of respondents on the disease tends to increase as their educational status increases. Knowledge on onchocerciasis is relatively low in the study areas. This is in line with a study carried out in South western Nigeria in which knowledge of the disease among respondents is extremely low (Richards *et al.*, 1995).

The findings from another study in Oji River also revealed knowledge on onchocerciasis to be low among respondents (Adeoye *et al.*, 2010), which supports the findings from this study.

The result of this study showed that majority of the respondents do not take ivermectin 50(56.82%) and only 27(30.68%) claimed to have participated in the CDTI programme. However, a larger percentage of the Respondents 68(77.27%) said that they control the disease by protecting themselves from the bites of blackflies in that they put on clothes like shirts and blouses with long sleeves, long robes and trousers that cover their arms and legs. This practice can give us a clue as to the reason for the negative results from the microscopic analysis despite the low intake of ivermectin in the area. Although 50(56.82%) admitted the importance of regular intake of ivermectin twice every year for 15 years (Mbanefo *et al.*, 2010), the actual intake of ivermectin was very low (37.50%) among respondents. In addition, only 33(37.50%) took Mectizan, but 40(45.45%) claimed to have not missed any dosing round for Mectizan. Major reasons given by respondents for non-intake of Mectizan is that there are not enough drugs to go round. Also, a general belief which seems to pervade the communities is that the drug is only for people with eye problems. This may also be the reason why although more than average claimed not to have missed any dosing round, only a few take the drug. This may mean that about 17.05% of the respondents probably receive the drug from CDDs during the annual

Table 2: Responses on prevalence, knowledge attitude and practices associated with onchocerciasis in Enugu East and Nkanu West Local Government Areas of Enugu state, Nigeria

Variable	Frequency	%
Awareness of Onchocerciasis as a disease		
Yes	21	24.00
No	67	76.00
Heard of Onchocerciasis Before?		
Yes	54	61.40
No	34	38.60
Causative agent of Onchocerciasis		
Filarial worm	19	21.60
Drinking contaminated water	7	7.95
Bad blood from mosquitoes	10	11.36
Strange object in the body	1	1.14
Witchcraft	3	3.41
No idea	48	54.54
Mode of transmission		
Person to person contact	7	7.95
Bite of black fly	19	21.60
Bite of mosquito	11	12.50
Cannot be transmitted	5	5.68
Drinking contaminated water	5	5.68
No idea	41	46.59
Prevention		
Protection from bite of black flies	11	12.50
Protection from mosquito bites	12	13.64
Avoid contact with infected persons	7	7.95
Chains and concoctions	2	2.27
Drinking clean water	3	3.40
No idea	48	54.54
Treatment		
Malaria drug	8	9.10
Mectizan (Ivermectin)	20	22.72
Herbs and concoctions	8	9.10
Blood tonic	2	2.27
No treatment	4	4.54
No idea	46	52.27
Participation in CDTI programme		
Yes	27	30.68
No	57	64.77
Non response	4	4.54
Intake of Ivermectin (Mectizan)		
Yes	33	37.50
No	50	56.82
Non response	5	5.68
Importance of Regular Uptake		
Yes	50	56.80
No	38	43.18
Missed any Dosing Round?		
Yes	48	54.55
No	40	45.45
Control of black flies		
Yes	68	77.27
No	15	17.0
Non response	5	5.68

dosing with ivermectin without actually taking it. An interesting finding in the course of this research is a belief in the ability of ivermectin to cure rheumatism and conjunctivitis. Some of the respondents admitted taking the drug for relief of pains due to rheumatism. However, this belief needs to be carefully investigated in order to ascertain the validity of such claims. On the other hand, it was observed in this survey that majority of the respondents in Ndiagu-Akpugo are aware of onchocerciasis, but their knowledge of aetiology, treatment and control of the disease is quite low. Since peoples' attitude to the cause of, clinical manifestations, treatment and various preventive measures of a disease are influenced by their knowledge of their condition (Manafa *et al.*, 2002), and considering the low level of knowledge of onchocerciasis among respondents in this study, residents of the study areas needed to be exposed to health education regarding issues of disease causation, treatment, vector biology and control (Mbanefo *et al.*, 2010). Health education has been recommended as a way of influencing peoples' knowledge about onchocerciasis (Adeoye *et al.*, 2010). This will in turn influence their attitude and practice on the disease. This survey revealed that in both communities, some of the respondents complained of body itching, and palpitation

done before skin snipping showed the presence of nodules. Although the result of the microscopic analysis showed zero prevalence for onchocerciasis in the communities, the relatively low sensitivity and specificity of the microscopic analysis to polymerase chain reaction (PCR) analysis suggests the need for further confirmatory analysis using PCR technique (Fink *et al.*, 2011).

Conclusion: This study showed the KAP of respondents to be low. Although palpitations done just before skin snipping showed presence of nodules on some of the participants, microscopic analysis of skin snips gave zero prevalence for the disease. We therefore recommend that a confirmatory PCR analysis be carried out on the samples which were stored in ethanol and on the blood smears collected on filter paper. Also, health education intervention needs to be carried out in the study areas so as to improve the residents' knowledge on onchocerciasis. This will in turn improve their attitude and practice on the disease and also improve the health seeking behavior of Residents of the communities.

ACKNOWLEDGMENTS

Our sincere gratitude goes to all those too numerous to mention who have contributed in one way or the other towards the success of this survey. Worthy of note is the Director General of the Nigerian Institute for Trypanosomiasis Research (NITR), Kaduna and the zonal officer NITR, South-East zone, Enugu.

We also appreciate the cooperation and support given to us by community leaders, focal persons and health workers in Ndiagu-Akpugo and Ugwogho-Nike communities.

REFERENCES

- ADEOYE, A. O., ASHAYE, A. O. and ONAKPOYA, H. (2010). Perception and attitude of people towards onchocerciasis (river blindness) in southwestern Nigeria. *Middle East African Journal of Ophthalmology*, 17(4): 310 – 314.
- ADETOKUNBO, O. L. and HERBERT, M. G. (2003). *Short Textbook of Public Health Medicine for the Tropics*. 4th Edition, Hoder Arnold, London.
- EEZZJUDUEMHOI, D. and WILSON, D. (2013). Onchocerciasis. eMedicine. www.emedicine.com/oph/topic709html. Accessed March 6, 2014.
- FINK, D. L., FAHLE, G. A., FISCHER, S., FEDORKO, D. F. and NUTMAN, T. B. (2011). Toward Molecular parasitological diagnosis: Enhanced diagnostic sensitivity for filarial infections in mobile populations. *Journal of Clinical Microbiology*, 49(1): 42 – 47.
- HOERAUF, A., BUTTNER, D. N., ADJEI, O. and PEARLMAN, E. (2003). Onchocerciasis. *Biomedical Journal*, 326: 207 – 210.
- MANAFA, O. U. and ISAMAH, A. N. (2003). Local knowledge and attitude about onchocerciasis in Oji River Local Government Area of Enugu State, Nigeria. *Epidemiology and Immunology*, 129(3): 629 – 633.
- MANAFA, O. U., AWOLOLA, T. S. and ISAMAH, A. N. (2002). Effectiveness of motivational strategies in sustaining compliance with community ivermectin therapy. *International Quarterly of Community Health Education*, 2: 177 – 189.
- MBANEFO, E. C., ENEANYA, C. L., NWAORGU, O. C., OGUOMA, V. M., OTIJI, M. O. and OGOLO B. A. (2010). Onchocerciasis in Anambra State, southeast Nigeria: Clinical and psychological aspects and sustainability of community directed treatment with ivermectin (CDTI). *Post Graduate Medical Journal*, 86: 573 – 577.
- NPC (2006). *Population Distribution by Sex, State, LGAS and Senatorial District: 2006 Census Priority Tables (Volume 3)*. National Population Commission, Abuja, Nigeria.
- NWOKE, B. E. B. (1990). The Socio-economic aspects of human onchocerciasis in Africa: Present appraisal. *Journal of Hygiene, Epidemiology, Microbiology and Immunology*, www.ncbi.nlm.nih

- [.gov/pubmed/2351818e](http://pubmed/2351818e). Accessed March 8, 2013.
- OPARA, K. N., USIP, I. P. and AKPABIO, E. E. (2008). Transmission dynamics of *Simulium damnosum* in rural communities of Akwa Ibom State, Nigeria. *Journal of Vector Borne Diseases*, 45: 225 – 230.
- RICHARDS, F. O., KLEIN, R. E., GONZALES, P. C., ZEA, F. R., GONGORA, R. S., CASTRO, R. J. and ZEA F. G. (1995). Knowledge, attitudes and practices during a community-level ivermectin distribution campaign in Guatemala. *Health Policy and Planning*, 10: 404 – 414.
- WHO (2012). *Expert Committee on the Epidemiology of Onchocerciasis*. WHO Technical Report Series No. 597. www.app.who.int/int/iris/handle/10665/41213? Accessed March 8, 2012.
- WHO (2013a). *Priority Eye Disease*. www.who.int/blindness/causes/priority/en/index1.html. Accessed March 4, 2013.
- WHO (2013b). *The importance of Onchocercial Skin Diseases*. www.who.int/tdr/publications/tdr-research-publications/oncho-sk9indisease/en/index.html. Accessed March 4, 2013.
- WHO/APOC (2013). *Community Directed Treatment with Ivermectin: Sustainability and Ownership*. <http://www.who.int/blindness/partnerships/APOC/en>. Accessed February 19, 2013.
- WIKIPEDIA (2013). Enugu State, Nigeria. en.wikipedia.org/wiki/Enugu_state. Accessed April 25, 2013.