



Knowledge, Attitude and Perception of Onchocerciasis and Ivermectin Treatment in Idogun Community, Ondo State, Nigeria

Olajide J. Afolabi^{1*}, Christopher E. Okaka², Iyabo Adepeju Simon-Oke¹
and Mobolanle O. Oniya¹

¹Department of Biology, Federal University of Technology Akure, Ondo State, Nigeria.
²Department of Animal and Environmental Biology, University of Benin, Benin City, Nigeria.

Authors' contributions

This work was carried out in collaboration between all authors. Authors OJA, CEO and MOO designed the study and wrote the protocol. Author OJA wrote the first draft of the manuscript with contribution from author CEO. Author OJA managed the literature searches and analyses of the data. Authors OJA, IASO and MOO managed the experimental process. All authors read and approved the final manuscript.

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ABSTRACT

Introduction: Onchocerciasis is a communicable parasitic disease caused by a nematode; *Onchocerca volvulus* and vectored by female *Simulium* blackfly. The disease is common among poor rural dwellers where it causes various degrees of skin and eye infections.

Objectives: To evaluate the knowledge, attitude and perception of onchocerciasis and its treatment with ivermectin

Methods: The study was undertaken in Idogun, an endemic community in Ose local government area, Ondo State. Structured questionnaire was administered to 384 respondents during personal interview and focus group discussion to obtain useful epidemiological information, while skin snip test was employed to determine the prevalence of the disease among the 384 respondents not

*Corresponding author: E-mail: jideaf077@gmail.com;

below 10 years of age that were randomly selected for the study. Chi-square at 5% significance level was used to establish the significance of various parameters tested in the study.

Results: The results revealed that 235 (61.2%) were ignorant of the disease while 149 (38.8%) respondents had adequate knowledge of the cause and mode of transmission of the disease. Meanwhile, skin snip test showed that the disease occurred more among the ignorant (22.9%) than the knowledgeable (5.2%). Ignorance of disease was further reflected in the response of the respondents to the cause and mode of infection. Most ignorant individuals in the community believed the disease can be contracted through sexual intercourse (4.6%), stepping on charms (3.9%), inherited from infected parents (6.3%), ageing (13.3%), lack of personal hygiene (7%) and too much farming (40.4%). Whereas, 15.6% of the study population had no idea of the cause and mode of the disease. The study further revealed that 24.7% of the respondents showed various side effects to the drug such as itching, rashes swelling wrinkles, dizziness and weakness. The side effects of the drug were observed to be more among the infected individuals (20.8%) than the uninfected individuals (3.9%).

Conclusion: The study suggests that there is need for intensive public enlightenment in the community to properly educate the community about the cause and mode of the disease.

Keywords: Onchocerciasis; ignorance; prevalence; ivermectin; Idogun.

1. INTRODUCTION

Onchocerciasis is a chronic parasitic disease that is caused by a filarial worm, *Onchocerca volvulus* and actively transmitted by a female haematophagous blackfly (*Simulium damnosum*) through bite when the vector is taking a bloodmeal from the host. The disease is most prevalent in Africa, where over 99% of the cases occur and 40% of all cases in Africa occur in Nigeria [1]. Hence, Nigeria is considered to be endemic for the disease. Knowledge of the people on the aetiology, cause and mode of transmission of the disease has always been an important factor in control and prevention of the disease in endemic areas. The people's attitude toward the disease further affects the acceptability of ivermectin which is the drug of choice for the disease. Ignorance of onchocerciasis in the endemic areas has also reduced the effort of various organizations such as World Health Organization, government and NGOs in eradicating the disease in endemic areas. In an attempt to evaluate the efficiency of the ivermectin, several authors had reported in their works that the knowledge and attitude of people about onchocerciasis had significant effect on the prevalence of infection [2-5]. In addition, the clinical symptoms of onchocerciasis are often misconstrued in the endemic communities with other diseases especially malaria and this has led to misuse of drugs, self medication and use of herbs among the infected individuals. Therefore, this research is intended to evaluate the knowledge, attitude and practice of the people in Idogun community to the disease and ivermectin therapy. The study will further

help to understand the community on the mode, the cause and the preventive measures that can be taken to completely eradicate the disease in the community.

2. MATERIALS AND METHODS

The study was undertaken in Idogun, an endemic community in Ose Local Government of Ondo State. Before the commencement of the study, approvals for the study were obtained at the Ondo State Ministry of Health, Ose Local Government Area and community head. Likewise, informed consent of the respondents was obtained after focal group discussion in local language, where they were made to know the benefits and discomfort of their participation in the study. Individuals who attended the public health clinic in Idogun and gave their consent to participate in the study were considered for the study. 235 participants of both sexes and not below 10 years of age who attended the community clinic were randomly selected for the study. Structured questionnaire was administered to obtain useful epidemiological information from the respondents. Bloodless skin snips were aseptically collected from the iliac crests of the respondents who presented with palpable nodules using sterile blood lancet and razor.

The snips were placed immediately in 0.5 ml normal saline in a microtitre plates and left for 4 hours to allow the microfilariae to migrate out of the tissues. The solution was centrifuged at 2000 rpm, the sediment was smeared on sterile slides and stained with Giemsa at pH 6.8. The

smears were examined for microfilariae under X10 objective lens of a microscope. The number of snips positive for the microfilariae was noted among the age groups and genders.

3. RESULTS

3.1 Knowledge on Aetiology, Cause and Mode of Transmission of Onchocerciasis in Idogun Community

The results show that the respondents (male and female) who are considered in the study have an age range of 10-90 years and distributed among four tribes i. e the Yoruba (which constitute the majority), the Igbo, Igbira and Fulani. The interview result as revealed by Table 1 showed that 235 (61.2%) respondents were ignorant of the disease while 149 (38.8%) had the knowledge about the disease. Laboratory screening of the snips of the respondents for *O. volvulus* microfilariae showed that the disease (onchocerciasis) occurred more among the ignorant respondents (22.9%) than the knowledgeable respondents (5.2%). This implies that knowledge of the disease had a significant effect on the prevalence of infection ($\chi^2 = 26.034$, $P = 0.000$, $P < 0.05$).

Ignorance of the disease is evident in the response of the respondents in Table 2 to the mode and cause of the disease as 15.6% of the respondents had no idea of the mode and cause of the disease while others had wrong knowledge about the disease in the community. For instance 4.6% respondents believed that the disease can be contracted by having sexual intercourse with the infected person, this explains why the female gender were stigmatised and had delayed marriage. Some individuals in the community (7%) also believed that individuals stand the chance of contracting the disease when personal hygiene is not maintained. Other group in the community (13.3%) believed the disease is one of the signs of ageing and as such common among the old people. Similarly, some respondents (6.3%) believed that the disease can be inherited from infected parent. The ignorance of the disease is also obvious in the community with the belief of some individuals (40.4%) that the disease results from engaging in too much farming especially when the farming is done closed to the river. Noteworthy in the community is the belief of some other respondents (3.9%) that the disease manifests in infected people after they might have stepped on charm. This further explains why most infected

people consult the herbalists for cure instead of going to the hospital for proper diagnosis and treatment of the disease.

3.2 Attitude and Perception of Respondents toward Ivermectin Therapy in Idogun Community

Distribution coverage of the drug (Ivermectin) among the respondents in Idogun community shows that 377 (98.2%) of the respondents collected the drug while 7 (1.8%) showed apathy to the drug (Table 3). Of the 377 respondents that received the drugs, 325 (84.6%) actually took the drug while 52 (13.5%) collected the drug but did not take the drug. Table 3 also revealed that more male ($n=177$, 81.2%) received the drug than the female ($n=148$, 89.2%) but the percentage of the female (89.2%) that actually took the drug is more than the male (81.2%). Meanwhile, Chi-square analysis revealed that difference in drug acceptance between gender is not statistically significant between genders (P value = 0.1, χ^2 value = 4.609, $P > 0.05$). This implies that not all the people that collected Ivermectin during drug distribution actually took the drug. Most respondents that rejected or refused to take the drug complained of side effects they suffered in the past as a result of taken the drug.

Evaluation of the side effects of the drug as complained and observed by/in the respondents in Idogun community and presented in Table 4 shows that 24.7% of the respondents showed side effects after taken the drug while 75.3% did not show any side effect to the drug. It was further observed that the side effects of the drug were more among the infected individuals (20.8%) than the uninfected individuals (3.9%). Large percentage of the respondents (43.2%) complained of itching after taken the drug while others complained of side effects such as rashes (12.6%), swelling of the skin (8.4%), wrinkling of the body especially of the calves and thighs (9.5%), dizziness (10.5%) and general weakness of the body (15.8%) (Table 5). The side effects of the drug significantly varied between genders ($p < 0.05$) with female (55.8%) manifesting more of the side effects than the male (44.2%).

3.3 Respondents' Knowledge on Disease Control and Prevention in Idogun Community

Table 6 showed that the community is not only ignorant of the mode and cause of river

blindness but also ignorant of the preventive and control measures. Only 149 (38.8%) respondents were able to give the correct methods of disease control such as consult the doctor for proper diagnosis and use the recommended drugs (18.8%), kill the blackfly (10.9%) and cover your body when going to the river (9.1%). Others (22.7%) believed that the disease can be controlled by avoiding the sick person (3.6%),

eating balanced diet (9.4%) and the use of herbs (5.7%). The respondents that believed in the use of herbs mentioned bitter leaves, bitter kola and *Azadirachta indica* (Dongoyaro) as herbal remedies for the disease. This suggests that most respondents in the community still confused the symptoms of the disease with that of malaria, hence justify why the disease still persist in the community.

Table 1. Aetiological knowledge or ignorance of onchocerciasis in Idogun community

Aetiological knowledge	Group A:	Group B:	Total
	Respondents ignorant	Respondents knowledgeable	
Number infected	88 (22.9%)	20 (5.2%)	108 (28.1%)
Number uninfected	147 (38.2%)	129 (33.5%)	276 (71.9%)
Total	235 (61.2%)	149 (38.8%)	384 (100%)

$$\chi^2 = 26.034; P = 0.000^{**}$$

Table 2. Respondents' knowledge about cause and mode of transmission of onchocerciasis in Idogun community

Cause and mode of transmission	Number	Percentage (%)
Sexual intercourse	18	4.6
Infected blackfly bite when visited the river	149	38.8
Stepping on charm	15	3.9
Inherited	24	6.3
Old age	51	13.3
Lack of personal hygiene	27	7.0
Too much farming	40	40.4
No idea	60	15.6
Total	384	100

Table 3. Ivermectin distribution coverage and acceptance level by sex at Idogun community

Sex	Volunteers: Who received ivermectin	Volunteers: Who did not receive ivermectin	Volunteers: Who did not receive ivermectin	Total
	A. Respondents who actually took the ivermectin	B. Respondents who did not take ivermectin		
Male	177 (81.2%)	36 (16.5%)	05 (2.3%)	218 (100%)
Female	148 (89.2%)	16 (9.6%)	02 (1.2%)	166 (100%)
Total	325 (84.6%)	52 (13.5%)	07 (1.8%)	384 (100%)

$$\chi^2 = 4.609; P \text{ value} = 0.100^{ns}$$

Table 4. Respondents with side effects after taken Mectizan in Idogun community

Respondents	Group A:	Group B:	Total
	Respondents with side effects	Respondents without side effects	
Number Infected	80 (20.8%)	28 (7.3%)	108 (28.1%)
Number uninfected	15 (3.9%)	261 (68%)	276 (71.9%)
Total	95 (24.7%)	289 (75.3%)	384 (100%)

$$\chi^2 = 3.084; P \text{ value} = 0.027^*$$

Table 5. Side effects of Onchocerciasis as perceived by the respondents in Idogun community

Side effect	Male (%)	Female (%)	Total (%)
Itching	15 (15.8)	26 (27.4)	41 (43.2)
Rashes	04 (4.2)	08 (8.4)	12 (12.6)
Swelling	06 (6.3)	02 (2.1)	08 (8.4)
Wrinkles	08 (8.4)	01 (1.1)	09 (9.5)
Dizziness	04 (4.2)	06 (6.3)	10 (10.5)
Weakness	05 (5.3)	10 (10.5)	15 (15.8)
Total	42 (44.2)	53 (55.8)	95 (100)

$\chi^2 = 12.692; P \text{ value} = 0.026^*$

Table 6. Respondents' knowledge about disease control in Idogun community

Preventive/Control methods	Number	Percentage (%)
Avoid contact with sick person	14	3.6
Consult the doctor to collect the drug	72	18.8
Kill the blackfly	42	10.9
Cover the body when going to the farm	35	9.1
Eat balanced diet	36	9.4
Use herbs	22	5.7
Don't know	163	42.5
Total	384	100

4. DISCUSSION

The evaluation of the knowledge, attitude and perception of respondents of the disease shows that there is dearth knowledge of the disease in the study area as the level of ignorance (61.2%) was higher than the knowledgeable (38.8%) in all the community. This shows that majority of the respondents in the community could not mention correctly the name of the infection, the causative agent, the vector and mode of transmission. Even the knowledgeable group could only mention worm and flies as the pathogen and vector of the disease respectively but could not give the specific names of the parasite (*Onchocerca volvulus*) and the vector (*Simulium* spp). Most respondents in the communities perceived the fly as a nuisance than a potential vector of infection. No wonder there was less preventive measures to the blackflies in the communities as they do to other notorious flies such as mosquitoes and houseflies.

The study further revealed that the knowledge of the cause and mode of transmission of onchocerciasis varied significantly among the respondents in the community ($p < 0.05$). As 38.8% of the respondents in Idogun believed that the disease is caused by worm which is injected through the fly bites. Other respondents had different perceptions on the cause and mode of transmission of the disease. For instance 4.6% of the respondents in the community believed that

the disease can be contracted through sexual intercourse, this suggests why most of the victims especially the females are stigmatised and had marital delayed. This finding has been supported by the reports of other authors [6-7]. Transmission through charms (3.9%) is not peculiar to this community has the findings had been reported although with higher percentage (43.8%) by [8]. Similarly, in Ife North, Osun State, 9.2% of the respondents perceived the disease as the act of witchcraft [9]. This explained why most of the victims seek remedy from traditional doctors rather than going to the hospital for proper diagnosis and chemotherapy. 6.3% of the respondents still believed the disease is inherited and as such has a family history. These individuals believed that the chance of having the disease is higher when one parent is infected. Some of the respondents believed strongly that the best way to avoid the disease is to avoid marrying from the family of infected person. This further explained why most of the infected persons suffered stigmatization in the community. This finding has been supported by the findings of previous authors [3,8]. Noteworthy, in the community are the beliefs of other respondents in the community such as old age, lack of personal hygiene and too much farming. The group that believed the disease is associated with old age perceived the disease as a process of ageing and as such presumed that the disease is common among the old people. Although, onchocerciasis has never been

associated with ageing but with the frequency of exposure to the vector, which age plays a vital role.

It was further observed that infection by onchocerciasis was more among the individuals that were ignorant than the knowledgeable. This shows that knowledge of the disease played a significant role in the prevalence of infection in the communities ($p < 0.05$). This finding has been supported by other authors [3,8,10,11].

The significant difference in prevalence of onchocerciasis between the ignorant and knowledgeable individuals had also been established by [4] in Okpuje community of Edo State where the prevalence of infection among the ignorance respondent was higher (29%) than the knowledgeable (3.5%).

The study revealed that ivermectin acceptability in the communities are 98.2% but it was observed that not all the respondents that collected the drug actually took the drug, 26.1% of the respondents in the community collected the drug but never used the drug. This suggests that for efficient control programme to be achieved, the public health officers including the community drug distributors (CDD) should ensure that the respondents who received the drug use the drug before leaving the clinic. The acceptability of the drug (ivermectin) in the communities is relatively higher when compared to the previous report (79.8%) from Oji-River local Government Area of Enugu State [12]. Also, significantly higher than the ivermectin acceptability in Okpuje, Edo State is 58.5% [4] and Ekpan village of Edo State is 85.7% [3]. This increase might be attributed to the extensive focus group discussion given to the respondents in the communities before administration of the drugs. This also suggested that public enlightenment programmes should be intensified in order to further increase the drug acceptability in the endemic communities.

The study also revealed that more female actually took the drug than the male. This might explain why the prevalence and symptoms of the infection are higher among the males than the females. The significant difference in prevalence of onchocerciasis has also been reported by other authors [5,13,14]. The subjects that rejected the drug complained of the side effects they had suffered in the past. Meanwhile the respondents who actually took the drug believed ivermectin is the drug of choice for the disease.

Among those who took the drug, 24.7% respondents reacted to the drug while 75.3% respondents did not experience any adverse effects of the drug in Idogun. Similar reactions to the drug had also been reported by [3] in Edo state. It was further observed that the adverse effects of the drug in the communities were more in the infected persons (20.8%) than uninfected individuals (7.3%). The side effects as reported by respondents in this community during the study include itching, rashes, swelling, wrinkles, dizziness and body weakness. But itching (pruritus) was found to be more predominant among the respondents than other side effects as it accounted for more than 43.2% of the side effects complained by the respondents in the communities.

The knowledge of the respondents about disease control revealed that 38.8% respondents from Idogun actually knew the correct methods of disease control and prevention. They knew that the disease can be cured by consulting a doctor for proper diagnosis and use of drug, prevented by killing the blackflies and covering the body when going to the farm. Some of the respondents had wrong ideas of disease control and prevention as they suggested that the disease can be controlled by avoiding contact with the infected persons, eating balanced diet and the use of herbs. The respondents who believed the disease can be controlled by eating balanced diet perceived the disease to be associated with poverty and malnutrition, hence, suggested improved standard of living as remedy to the disease. The study further revealed that large percentage of the respondents (42.5%) in Idogun had no knowledge of the disease control and prevention.

5. CONCLUSION

In conclusion, the findings of the study showed that there is high level of ignorance of the disease in the community especially on vital information regarding the aetiology, cause and mode of transmission, control and prevention of the disease and this might be a major impedance to the efficient control of onchocerciasis in this community. This ignorance might be one of the factors that determines the prevalence of infection in the community. Therefore, to achieve a meaningful progress in disease control and prevention, health education especially in local languages should be intensified in this area.

ETHICAL APPROVAL

All authors hereby declare that all experiments have been examined and approved by the appropriate ethics committee and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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