Understanding onchocerciasis perception and treatment experiences in a rural community in Cross River State, Nigeria: Implications for control

Abstract

Background: Onchocerciasis a disease of poverty continues to place huge health, economic and social burden on communities at risk. Understanding critical factors that impact on treatment access, acceptance and overall control measures are pivotal to the march towards elimination.

Objective: to assess Onchocerciasis perception and treatment experiences in a rural community in Cross River State, Nigeria

Methodology:
A cross-sectional descriptive study using mixed method. Data was collected using pretested questionnaire and in-depth interview guide. Quantitative data was analysed using SPSS while the in-depth interviews were audio taped, transcribed verbatim and thematic analysis done. Findings were presented in frequencies, charts, percentages, tables and quotes. Tests of significance were determined using Chi-square (χ^2) at significance level of 5%

Results: Ignorance, myths and negative perception about the cause of onchocerciasisas still persist as 31.2% of the respondents did not know that the bite of infected Blackfly is the cause. Attribution to curse from the gods (45.3%) and witchcraft (23.4%) are common. This poor knowledge is associated with level of education ($p = 0.01$). Non-availability of drugs (23.9%) and lack of knowledge on where to access ivermectin (9.8%) were the major challenges to ivermectin uptake. Inequity in access to treatment identified from the thematic analysis.

Conclusion: Inconsistent availability of ivermectin, myths and misconceptions about cause of onchocerciasis still pervades with the dangerous consequential drive for poor health- seeking behaviors, discriminatory practices and poor treatment coverage. Appropriately integrating contextual knowledge about onchocerciasis into the design control strategies may present a vantage march towards achieving elimination target.

Key words: Onchocerciasis; ivermectin treatment; Onchocerciasis perception; inequity in access
Running Title: Onchocerciasis perception and treatment experiences

Introduction

Onchocerciasis (river blindness) a disease of poverty continues to place huge health, economic and social burden on communities at risk. The disease is a major problem among rural communities living in close proximity to rivers in sub-Saharan African countries. An estimated

25 million people are infected with about 1.3 million people visually impaired or blind as a result of the disease [1, 2]. Nigeria is estimated to bear a significantly high burden of the disease with 32 endemic states including Cross River State [3, 4]. In Cross River State, almost all the 18 local government areas (LGAs) are endemic for the disease and the onchocerciasis prevalence was estimated to be 10% in 2012 [5], which may be gross underestimation given lack of credible population data in this environment.

Community Directed Treatment with Ivermectin (CDTI) is the major control strategy adopted in African countries by the African Program for Onchocerciasis Control (APOC). CDTI primarily involves yearly mass drug administration (MDA) of Ivermectin. Despite the successes this strategy has engendered [6,7,8], meeting target goal set for elimination of onchocerciasis seems far-fetched [9,10,11]. However, ignorance, myths and misconceptions about onchocerciasis have been implicated in the drag to elimination. These have equally been acknowledged to lead to negligence in prevention and control measures and causes acceptance of inappropriate treatment regimen.

It has been recognised that knowledge of history and cause of a health condition including the whole continuum of epidemiology of the disease often promotes health-seeking behaviours and encourages reduction of effects or elimination of the disease [9,11,12,13,14]). Silumbwe *et al* [14] opined that often programme implementation strategies do not take into account the contextual factors that impact on overall programme success. Some of the key factors that have been suggested by many studies include; knowledge of cause and transmission of the infection, perception of disease symptoms, socioeconomic burdens of the disease, first point of call or

source of treatment, factors affecting treatment regimen such as willingness to pay for treatment or otherwise, acceptance of treatment and prevention/control measures [8,11,12,13,15].

In addition, lack of knowledge of transmission of onchocerciasis can also manifest in discriminatory and stigmatizing attitudes towards those affected [10,15]. This in turn may negatively affect the health-seeking behaviours of those affected by onchocerciasis [8,16]. This may further limit access to ivermectin, acceptance of treatment and overall treatment coverage [13,17].

Another crucial factor in this could be lack of close monitoring of drug treatment and distribution by Community –directed Distributors (CDD) often occasioned by technical and logistics limitations in their ability to deliver interventions [1, 2, 5, 18]. It has been equally suggested that poor compliance to treatment may not be unrelated to long treatment duration (10 – 15 years), interval between doses (one year) that can easily be forgotten and thus missed, adverse events in ivermectin treatment often leading to rejection of treatments by communities [1,3,6]. Reinvasion caused by limited treatment coverage area has also been implicated in low CDTI programme success [15,17,19]. Perhaps this could be attributed to the inconsistent availability of ivermectin in states and government's inability to complement the efforts of APOC leading to poor distribution and follow-up in affected communities [2,5,18].

To attain community participation and design socially/locally acceptable control strategies, health program planners and implementers should be familiar with people's knowledge, attitude and practice in relation to onchocerciasis and other cultural innuendos that impact onchocerciasis treatment access, coverage and other control measures [8,10]. The successful use of ivermectin at community level requires a broad public health program designed to address barriers to

treatments. Understanding the peoples' knowledge and perceptions of onchocerciasis may stand as important promoters of effective onchocerciasis control strategies [4,16,20]; especially in gaining the community's buy-in and confidence to participate in control programme [11,12,16,19]. There is paucity of information as few studies have been carried out to understand these issues in this environment. Therefore, this study aimed at assessing Onchocerciasis perception and treatment experiences in a rural community in Cross River State, Nigeria to generate information that could upwardly drive demand for treatment and to push uptake of overall onchocerciasis control measures.

Research Methodology

Study setting

The study setting was Akamkpa local government area (LGA) in Cross River State located in the South-South region of Nigeria. It is one of the foci points of Onchocerciasis endemicity in the State. Akamkpa LGA lies within longitude $5^{o}25'$, East of the Greenwich Meridian and latitude $8^{o}31'$ North of the equator. It has 10 political wards (Akamkpa Urban, Awi, Eku, Iko, Ikpai, Mbarakom, Oban, Ojuk North, Ojuk South and Uyanya) and a projected population from the 2006 figures to 2017 of about 203,705 using annual growth rate of 3.0%. The study area has the largest forest area in the state and a very fertile land, watered by many rivers, streams and springs; veritable breeding ground for blackflies.

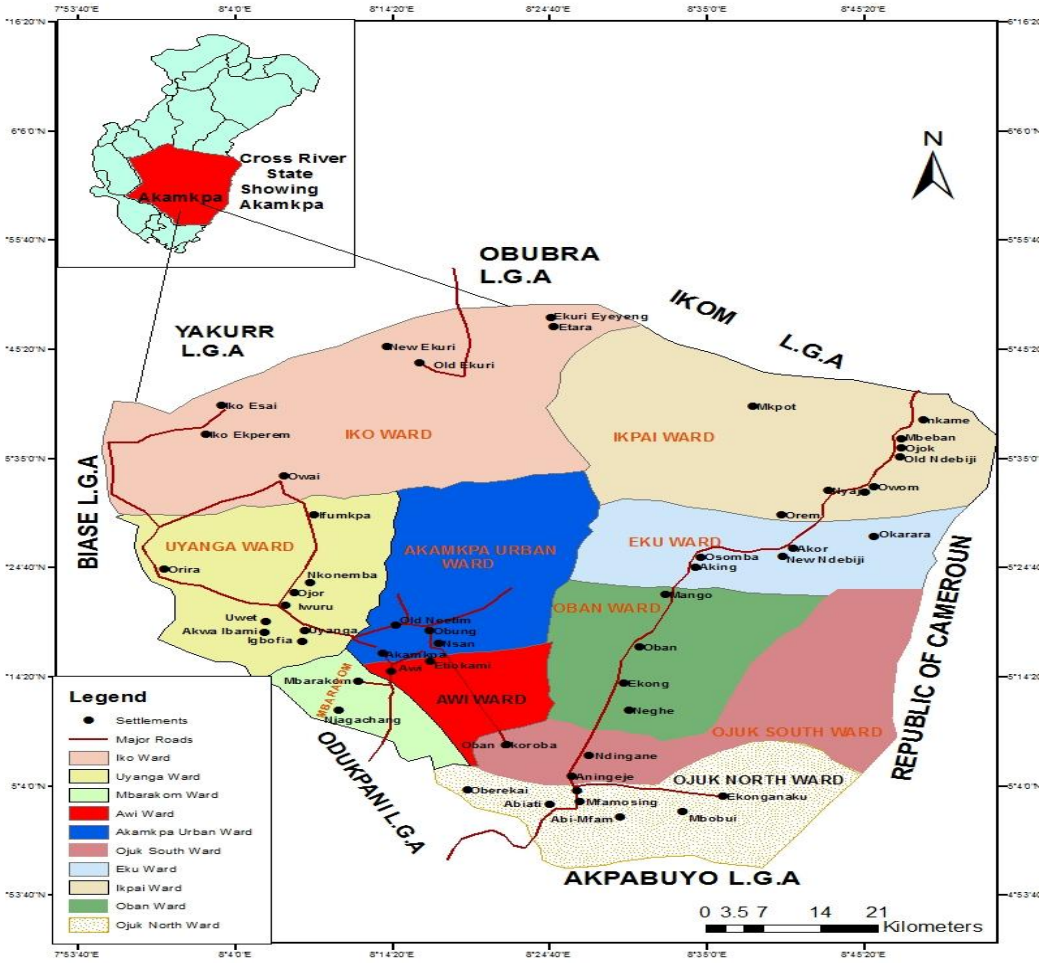

Figure 1: Map of Akamkpa Local Government Area, Cross River State, Nigeria

Study design, sample size and sampling

This study is a cross-sectional descriptive study using a mixed method approach comprising both quantitative and qualitative data collection methods. The study population was limited to individuals residing within Akamkpa Local Governmennt Area of Cross River State aged 15years and above. The sample size for this study was 205 for the quantitative data. The sample size was determined using the formula for dichotomous descriptive study [21]; employing the

10% prevalence of Onchocerciasis in Cross River State estimated by Cross River State NTD Centre (Eyo, 2016) at 95% confidence interval and 5% precision. Simple random sampling technique was employed to select the respondents. A total of 25 respondents participated in the in-depth interviews comprising two from the NTD centre in Calabar, the Primary Healthcare Coordinator for Akamkpa LGA, the in-charge in each of the 10 PHCs, two active ivermectin Community-directed Distributors (CDDs) and 10 community leaders across all the wards.

The instrument for data collection was semi-structured interviewer-administered questionnaire. It comprised of four sections. Section A elicited information on the socio-demographics of the respondent; Section B on knowledge, perceptions and beliefs about Onchocerciasis; while sections C and D covered Onchocerciasis treatment and factors influencing Onchocerciasis treatment respectively. In-depth Interview guide was designed to explore the experiences of individuals residing within Akamkpa LGA. Each interview session lasted for about 90minutes.

Data analysis

Quantitative data obtained from the study were entered, coded, cleaned and analysed using Statistical Package for the Social Sciences (SPSS version 20). Quantitative data was presented using descriptive statistics. Categorical variables were reported as frequencies (and percentages) while normally distributed continuous variables reported as means and standard deviations. Tests of significance were determined using chi-square (χ^2). Each In-depth interview was tape recorded. All audiotapes from the key informant interviews were transcribed verbatim into word documents. The transcripts and notes were analysed by themes described in the literature review as well as novel opinions expressed during the data collection process.

Ethical considerations

Ethical clearance for conduct of this study was obtained from the Cross River State Ministry of Health, Health Research Ethics Committee. The research participants were briefed on the purpose of the study and verbal consent was obtained from them to enroll into the study. Participants who did not wish to be included in the research were excused from the study. Participants were provided all the necessary information about the research and were assured of strict confidentiality and anonymity.

RESULTS

Socio-demographic characteristics of respondents

A total of 205 respondents responded to all the items in the survey questionnaire; giving a response rate of 98%. There was a slight preponderance of males; 105 (51.2%) with the respondents having a mean age of 31.9 ± 12.3 years. Almost a half of the respondents were married; 103 (50.7%). Respondents with a household size of 4- 6, were in the majority followed distantly by respondents with 1 – 3- member household. Most of the respondents had attained secondary level of education (113; 55.1%) with those with no formal education being the least (6; 2.9%). The highest proportion of the respondents were self-employed (65; 31.7%), followed by civil servants and farmers which were equally proportioned (40; 19.5%) amongst the respondents. Most of the respondents had lived in the study area (Akamkpa LGA) for more than 15 years (74; 36.1%). The detailed data on socio-demographic characteristics of the respondents is shown in Table 1.

Table 1

Socio demographic characteristics of respondents, Akamkpa LGA, Cross River State

Variables	Frequency (n = 205)	Per cent (%)
Sex		
Male	105	51.2
Female	100	48.8
Family Size		
1 - 3	52	25.4
4 - 6	104	50.7
7- 9	35	17.1
>10	14	6.8
Marital Status		
Single	97	47.3
Married	103	50.2
Widowed	3	1.5
Divorced	2	1.0
Educational level		
No formal education	6	2.9
Primary	37	18.1
Secondary	113	55.1
Tertiary	49	23.9
Occupation		
Civil Servant	40	19.5
Farmer	40	19.5
Self-employed	65	31.7
Student	46	22.4
Others	14	6.8
Duration of stay in Akamkpa LGA		
<2 years	17	8.3
2 - 5 years	28	13.7
6 – 10 years	60	29.3
11 – 15 years	26	12.7
>15 years	74	36.1
	Mean	Standard Deviation (SD)
Age (Years)	31.9	12.3

Knowledge and perception on onchocerciasis

Ignorance, myths and negative perception about the cause of onchocerciasisas still persist as 64 (31.2%) of the respondents did not know that the bite of infected Blackfly is the cause (Table 2). Most attributes it to curse from the gods (29, 45.3%) and witchcraft (15, 23.4%). Cross tabulation of knowledge about cause of onchocerciasis against level of education of survey

174 respondents (figure 2) indicated statistical significance ($\square^2$ = 11.32; p =0.01). This becomes all
175 the more significant given that majority of the respondents (55.1%) had attained at least
176 secondary level of education (Table 1).
177
178 Of the 205 survey respondents, 24 (11.7%) acknowledged that they suffer from onchoceriasis.
179 These were diagnosed at the health facility (66.7%); while 33.3% of those with onchocerciasis
180 were diagnose during mass screening exercise. There was also a reported knowledge of family
181 members suffering from onchoceriasis with 36 (17.6%) affirming to that. Majority of those had
182 one to two persons (51.3%) in the family with onchocerciasis (Table 2). This could be an
183 indication of how wide-spread onchocerciasis burden is in the study area.
184
185 The onchocerciasis prevention methods suggested by survey respondents (Figure 3) plays into
186 the knowledge and perception about the cause of the disease (Table 2). High proportion of the
187 respondents inferred that good sanitation and personal hygiene (133; 64.9%) followed by (33;
188 16.1%) that indicated that wearing of protective clothing were the viable onchocerciasis
189 prevention strategies. Use of mectizan (8; 3.9%) and health education on prevention (5; 2.4%)
190 key onchocerciasis prevention strategies were the least mentioned by the respondents.
191
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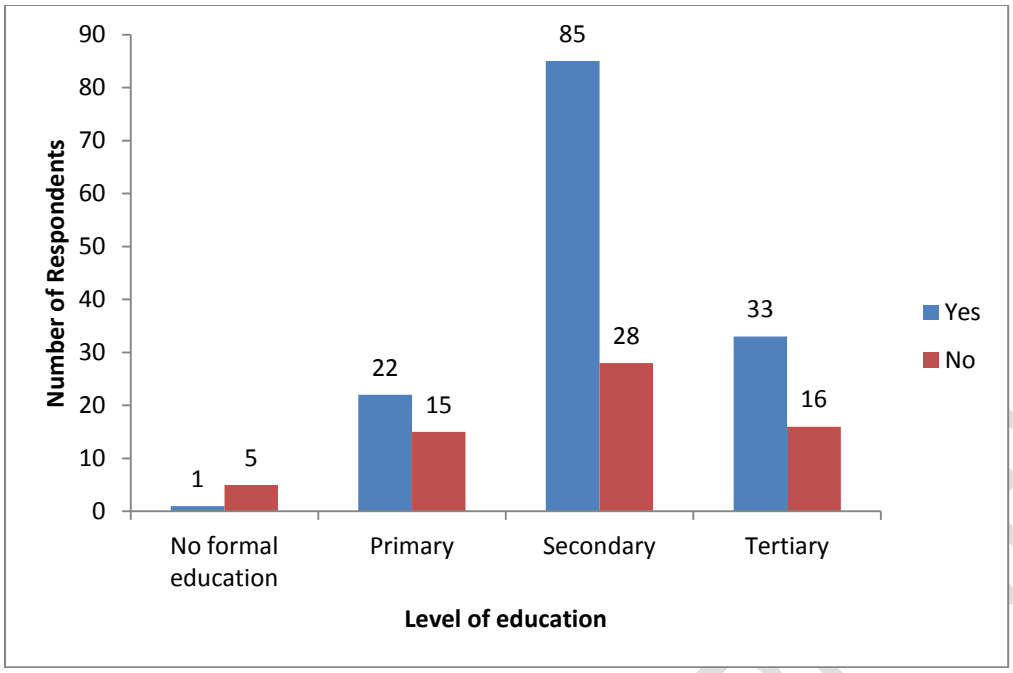

FIG 2: Knowledge of cause of Onchocerciasis by Educational Level

Table 2: Respondents' onchocerciasis knowledge and treatment profile

Variables	Frequency	Percentages
Knowledge of cause of Onchocerciasis		
Yes	141	68.8
No	64	31.2
Total	**205**	**100**
Lack of knowledge of cause of Onchocerciasis (Attributions)		
Animal	9	14.1
Curse from the gods	29	45.3
Kissing	2	3.1
Witchcraft	15	23.4
Don't know	9	14.1
Total	**64**	**100**
Has Onchocerciasis		
Yes	24	11.70
No	181	88.29
Total	**205**	**100**
How Onchocerciasis was diagnosed		
Visited health facility	16	66.67
Mass screening exercise	8	33.3
Total	**24**	**100**
How long with Oncho		
1 – 3 months	3	12.5
4 – 6 months	2	8.33
7 – 12 months	6	25.00

>12 – 36 months	5	20.83
>36 - 60 months	2	8.33
>60 months	6	25.00
Total	**24**	**100**
Treatment Status (Are you on treatment?)		
Yes	21	87.5
No	3	12.5
Total	**24**	**100**
Source of treatment		
Community Drug Distributors (CDDs)	18	85.7
Health Facility	2	9.5
Patent Medicine Store	1	4.8
Total	**21**	**100**
Family member with Onchocerciasis		
Yes	36	17.56
No	169	82.43
Total	**205**	100
Number of family member with Onchocerciasis		
1 – 2 persons	20	51.28
3 – 4 persons	8	22.22
5 – 6 persons	3	8.33
≥7 persons	4	11.11
Total	**36**	**100**
Oncho MDA participation		
Yes	138	67.3
No	67	32.9
Total	**205**	100
Duration of Oncho MDA Participation		
< 6 months	10	7.25
6 – 12 months	13	9.42
>12 – 36 months	51	36.96
>36 – 60 months	26	18.84
>60 months	38	27.54
Total	**138**	
Source of Oncho MDA		
Community Drug Distributors (CDDs)	100	72.5
Health Facility	35	25.4
Patent Medicine Vendor (“Chemist”)	3	2.2
Total	**138**	**100**
Payment for treatment		
Yes	8	5.8
No	130	94.2
Total	**138**	**100**

Access and uptake of ivermectin

Community-directed distributors (CDDs) still remain the main stay of onchocerciasis treatment (72.5%). Though health facilities (25.4%) and Patent Medicine Vendor, popularly known as "Chemist"(2.4%) were reported as the source of treatment for the rest of the respondents. A small proportion (5.8%) of the surveyed respondents reported paying for the treatment (Table 2). This is significant as the Community-directed treatment with Ivermectin (CDTI) strategy is designed as entirely free-of charge for the recipients. When this is tied to about 2.9% of the respondents that indicated that cost of the ivermectin was a challenge to its uptake (Table 3), it becomes noteworthy with respect to increasing treatment coverage and ultimately elimination targets.

A significant proportion of the respondents reported having difficulties in accessing onchocerciasis treatment services (Table 3). Majority indicated that lack of availability of drugs (49; 23.9%) followed closely by lack of knowledge of where to get ivermectin (20; 9.8%). Other access hindering factors reported by survey respondents included far distance to health facility (9; 4.4%) and poor attitude of healthcare providers (9; 4.4%). Possible adverse drug reaction (12; 5.9%) and rejection of ivermectin (7; 3.4%) were also mentioned by survey respondents as affecting the uptake of ivermectin.

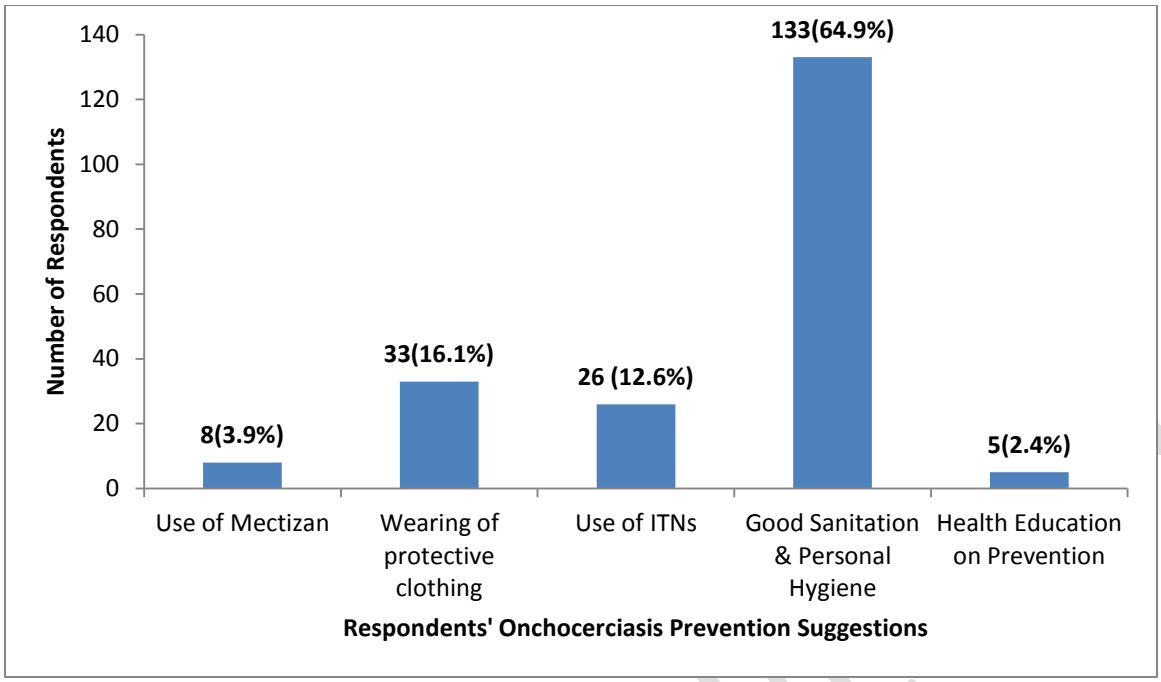

Fig 3: Reported Respondents' Onchocerciasis Prevention strategies

Table 3
Challenges to ivermectin uptake

	Variables	*Frequency (n = 205)	
		Yes (%)	No (%)
a	Treatment drugs not available	49 (23.9)	156 (76.1)
b	Distance to the health facility is too far	9 (4.4)	196 (95.6)
c	I don't know where to get the drugs	20 (9.8)	185 (90.2)
d	Poor attitude of the health care providers	9 (4.4)	196 (96.6)
e	Cost is too high	6 (2.9)	199 (97.1)
f	I don't like taking the drug	7 (3.4)	198 (96.6)
g	I always forget to take my drugs as when due	6 (2.9)	199 (97.1)
h	The drugs make me feel uncomfortable	12 (5.9)	193 (96.6)

*Multiple responses
(Variables a - e speak to issues of access)

235 ***Table 4: Study Qualitative results***

Major Theme	Sub-themes	Quote
Onchocerciasis is a Huge burden	occurrence of the diseases due to the terrain, Neglected tropical diseases	*"Onchocerciasis is definitely a problem; it affects the larger community in the Local Government Area"* *"Yes, it a major problem as it is been called a neglected tropical disease"*
Myths and Misconceptions	Myths and Misconceptions Cause by witchcraft Curse from god Attack from enemy	*"The belief in witchcraft still stands, because every small thing that happens to them, they attribute it to witchcraft".* *"When people fall sick which they don't know the possible cause they will either say it an attack from their enemy or witchcraft* *Most people in this community still belief that onchocerciasis is caused by witchcraft due to the nature of the disease*
Discrimination and stigmatization	Negative attitude, financial incapacitation, blindness, high social burden	*"You know predominantly in Akamkpa, a larger number of them are farmers, especially those in the interior, it affect them because most of them will not be able to go to Farm"* *"Family that has somebody who is affected… the economy and everything in that family will not go on well, because as a father in the family you will not be able to go and fetch out what the family will eat and it will be shame and a mocking of family and stigmatization"* *"it affects them because when it affects the eye, the eye is the mirror for everybody, if the eye is affected, it means even the family, community or the whole Nation is affected."* *it doesn't actually kill but it gives indelible marks and some of them develop eye problem that they don't know the origin* *the economy and everything in that family will not go on well, because as a father in the family you will not be able to go and fetch out what the family will eat and it will be shame and a mocking family and stigmatization* *The disease makes people to depend on others too much*
Treatment of Onchocerciasis using Mectizan and Abendazole	Treatment by faith, belief, prayers	*They are mostly treated during campaigns; we give them mectizan in combination with Abendazole mostly during campaign.* *I don't belief the drugs work* *Due to some peoples Religious belief, they seek the face of God or look for other alternative especially if they don't know the possible causes*
poor community engagement/involvement	Lack of incentives for volunteers,	*People who work during the first phase, during the second phase, they were not be willing saying that the money given*

poor programme Governance and Disillusionment	Poor political commitment, Religious belief, poor attitude, poor road network, Hard to reach area Language barrier, Lack of community cohesion	*to them is not commiserate with the job.* *I stopped working to give the drugs because the families were hostile* *There are people who are living in very remote areas that the drugs cannot reach there, bike cannot get there, others includes language barrier and religion* *Our leaders think of themselves more. They don't care* *They pay them a token at the end of their services from the donor agency…There is nothing coming from the community, or PHC* *Their mentality here is quite difference, even when you take a good thing to them. They will still politicize it. Immediately they see you they will ask what have you brought for us talkless of saying how to support, they will not….*
Inequity in access	increase funding, community participation, poor Availability of Drugs Increasing awareness in hard to reach community	*It's something that Government should take control because donor at a time, they may opt out. Like in other programs that we have… if it is Government own it will be sustainable* *Distribution shouldn't be only during campaign.* *People should be aware , all those remote area, we should try as much as possible to reach out to them so that the people should be aware* *they can step down to the community, we have to meet the opinion leaders in the community, the elders also the religious leaders especially those churches that their religion serves as a barrier.* *People from the Cameroon as they move in they should be able to access the drugs, So I think it should be drug that should be in the facility as they come they find it.*

Discussion

Improving treatment access and overall coverage are critical targets that must be vigorously pursued if the set goal of elimination of onchocerciasis by year 2025 is to be achieved. However, achieving this lofty goal should be predicated on understanding critical factors that impact on treatment access, acceptance and overall onchocerciasis control measures. This study therefore sought to understand perceptions and treatment experiences regarding onchocerciasis in a rural setting in Nigeria.

The findings of this study show that about 68.8% of the respondents had knowledge that the cause of onchocerciasis is by bite of black flies. Such knowledge varies across studies with 69.4% in South-East Ethiopia [10] and 70% in Guatemala [15] reporting similar knowledge levels. However, studies by [13] in Bioko Island, Equatorial Guinea and [16] in Ogun state of Nigeria reported even lower percentages of 19.3% and 9.8% respectively.

It then follows that about 31% of the respondents in this study did not know that the bite of infected Blackfly can cause onchocerciasis. This is in spite of seemingly moderately high educational level of the respondents. Most of the survey respondents (55.1%) had attained at least secondary level of education. Similarly, in a study carried out in Enugu, Nigeria, more than half of the respondents (57%) had no knowledge of the cause of onchocerciasis [12]. This thus reflects that myths and misconceptions on the causes of onchocerciasis still persist in the study area as most of the respondents in this study attributed the cause of onchocerciasis to curse from the gods (29, 45.3%) and witchcraft (15, 23.4%), this is similar to the study carried out by [10]. Hence, among other consequences, this observation of ongoing misconceptions and myths from

our survey may lead to the poor attitude and practices toward predisposing factors for onchocerciasis infection in the study area. Erroneous beliefs about onchocerciasis could lead to abandonment of personal protective measures and other preventive practices [5,8,9,10].

The pervading ignorance and poor perception on onchocerciasis is evidently reflected in the respondents suggested prevention strategies. Most (64.9%) reported that good sanitation and personal hygiene were best for onchocerciasis prevention and control. This is against the small proportion that suggested use of Mectizan (3.9%) and health education on prevention (2.4%) viable onchocerciasis prevention strategies. These x-ray the intertwined effects of lack of knowledge in reinforcing inappropriate health-seeking behaviors that invariably influence treatment distribution, acceptance and coverage [8,11,13].

Lack of knowledge and poor perception of onchocerciasis may equally not only manifest in discriminatory and stigmatizing attitudes and practices with the consequential drive for poor health- seeking behaviors that further limit access to mass drug (ivermectin) administration (MDA) [4,17], but may also affect overall efficacy of ivermectin treatment, treatment coverage and communities participation in onchocerciasis control programme [11,12,16,19]. These perceptions and ignorance were also re-echoed as major themes from the key-informant interviews;

> *"Most people in this community still belief that onchocerciasis is caused by witchcraft due to the nature of the disease" (Key informant)*

> *"When people fall sick which they don't know the possible cause they will either say it is an attack from their enemy or witchcraft" (Key informant)*

In addition to the foregoing, the fact that the respondents' level of knowledge on the transmission of onchocerciasis had a statistical significance (χ^2 = 11.32; p =0.01) with their highest attained level of education suggests that more than formal education may be required to bring about change that can positively influence onchocerciasis elimination target [7,11,13,16]. This also significantly ties to the fact that this study's respondents are relatively young with a mean age of 31.9 ± 12.3 years and ought to have access to general information often facilitated by modern technology that should be of benefit to onchocerciasis prevention and control. This therefore becomes quite pivotal in the whole scheme of onchocerciasis control, if sustained efforts at its elimination is to yield great results, the youths as special group and this generation's successors must be appropriately targeted with basic factual knowledge about onchocerciasis.

The proportion of study respondents that reported experiencing onchocerciasis symptoms (11.1%) or having family members with such symptoms (17.6%) provides insight to the magnitude of onchocerciasis as a public health burden in the study environment. When the sample size (205) used in this survey is matched against the total population (203,705) of Akamkpa LGA as at 2017, then, the extrapolation of onchocerciasis prevalence may be far above the prevalence estimates of 10% reported in 2012 [5]. This is despite the fact that MDA of ivermectin has been on in the study area for over seven years. Findings of the qualitative aspect of this study supports that onchocerciasis is a problem;

"Onchocerciasis is definitely a problem; it affects the larger community in the Local Government Area" (Key Informant)

"Yes, it's a major problem; as it is been called a neglected tropical disease" (Key Informant).

Stigmatization, financial incapacitation and blindness were major themes acknowledged from qualitative analysis of this study. The negative effects of Onchocerciasis on the family, community and society were also identified by the respondents. These findings not only buttress the health burden posed by onchocerciasis but also strengthen the fact that Onchocerciasis entrenches the vicious cycle of poverty, incapacitates and increases dependency. The aforementioned are supported by [4,9,12,20], that opined the association of onchocerciasis with poverty, stigmatization, discrimination, unemployment and other social and economic consequences.

> *"You know predominantly in Akamkpa, a larger number of them are farmers, especially those in the interior, it affects them because most of them will not be able to go to Farm"*

> *"Family that has somebody who is affected… the economy and everything in that family will not go on well, because as a father in the family you will not be able to go and fetch out what the family will eat and it will be shame and a mocking of family and stigmatization"*

> *"it affects them because when it affects the eye, the eye is the mirror for everybody, if the eye is affected, it means even the family, community or the whole Nation is affected."*

The preceding statements may thus be suggestive of ongoing challenges to ivermectin uptake experienced by respondents. Significant proportion of respondents indicated that lack of availability of drugs (23.9%) followed by lack of knowledge of where to get the drugs (9.8%) were the chief ivermectin uptake-drag. These could be a proxy of inequity in access to treatment. These findings are in consonance with [2,16,17,18] that inconsistent availability of ivermectin has been implicated in low Community-directed treatment with ivermectin (CDTI) programme success. This is all the more critical in areas experiencing increased influx of displaced and refugee populations as its being experienced in Cross River State, Nigeria.

Other factors reported by respondents include dislike for the drugs (3.4%) and fear of ivermectin-related adverse reactions (9.3%). These are in agreements with [15,16] that reported fear of adverse reaction as reason for non-compliance with intake of the drugs. Adverse events in ivermectin treatment have also been acknowledged to lead to rejection of treatments by communities [1,3,6]. This thus limits treatment coverage and impacts on possible reinvasion and perpetuation of onchocerciasis endemicity.

Another onchocerciasis treatment experience reported by respondents is the issue of payment for treatment (5.8%) with small proportion but significant number of respondents indicating that high cost of treatment (2.9%) was a challenge to ivermectin uptake. This becomes a concerning finding as regards onchocerciasis elimination targets, given that CDTI are made almost entirely free-of- charge to recipients in communities at risk. Made possible by multiple source donations, coordination and collaborations [1,6,9,14,18].

Conclusion

Inconsistent availability of ivermectin, myths and misconceptions about cause of onchocerciasis still pervades with the dangerous consequential drive for poor health- seeking behaviors, discriminatory practices and poor treatment coverage. These findings may not be typical of the study area. Thus these treatment experiences and knowledge level about onchocerciasis may be wide spread among communities at risk. Therefore, improved consumer knowledge of disease causation is considered a prerequisite for any disease control efforts. Better knowledge is shown to have a positive effect on prevention, treatment seeking and adherence to treatment, hence facilitates reductions in the socioeconomic burden of the disease. Moreover, appropriately

integrating contextual knowledge about onchocerciasis into the design control strategies may present a vantage march towards achieving elimination targets.

Ethics approval and consent to participate

Ethical clearance for conduct of this study was obtained from the Cross River State Ministry of Health, Health Research Ethics Committee. The research participants were briefed on the purpose of the study and verbal consent was obtained from them to enroll into the study. Participants who did not wish to be included in the research were excused from the study. Participants were provided all the necessary information about the research and were assured of strict confidentiality and anonymity.

Competing interest

The authors declare that we have no competing interest.

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