

ORIGINAL ARTICLE**KNOWLEDGE AND BELIEF ABOUT CAUSE AND PREVENTION OF ONCHOCERCIASIS IN BEBEKA, SOUTHWEST ETHIOPIA****Daniel Yirga^{1*}, Kifle Woldemichael², Mekite Wondafrash³, Wondwossen Kassahun², Kebede Deribe⁴****ABSTRACT**

BACKGROUND: Ignorance and incorrect beliefs can lead to negligence in prevention, control measures and in seeking appropriate treatment. Involvement of individuals and communities is an important component of Onchocerciasis control activities. To attain community participation and design socially acceptable control strategies, researchers must be familiar with people's knowledge, beliefs and behavior in relation to Onchocerciasis. Such information is scanty as very few studies have been carried out to understand these issues. The objective of this study was to investigate people's knowledge and beliefs in relation to the cause and prevention of onchocerciasis in rural areas of Southwest Ethiopia.

METHODS: A cross-sectional study was conducted in February 2008 among 450 study participants selected by multistage probability sampling. Data were collected using a pre-tested interviewer administered structured questionnaire which then were analyzed using SPSS for windows version 11.5.

RESULTS: All the 450 respondents had heard about onchocerciasis. A range of causes for onchocerciasis were identified. Overall, 248 (55.3%) of respondents had at least one misconception about the cause of onchocerciasis. There is a range of misconceptions about modes of transmission including contact with infected person, airborne, sharing cloths and sexual. Only 10% knew that black fly breeding in fast flowing rivers and streams as a cause for the transmission. Overall 397(88.2%) said that onchocerciasis is preventable, out of which 376 (94.7%) indicated use of drug as the means of preventing onchocerciasis. Nearly three-fourth of respondents 334 (74.3%) rated the severity of onchocerciasis as high. Nearly half (48%) rated the magnitude of onchocerciasis in their village as high, and 195 (43.3%) of them stated that they are highly at risk.

CONCLUSIONS: While Onchocerciasis is endemic in the study area, large proportion of the community held misconceptions about its causation, transmission, prevention and risk. Therefore, community interventions for onchocerciasis need to include behaviour change communications aimed at dispelling misconceptions and increasing risk perception.

KEYWORDS: Onchocerciasis, Knowledge, Beliefs, Bebeka, Ethiopia

INTRODUCTION

Onchocerciasis, "river blindness", is a parasitic disease caused by a filarial worm called *Onchocerca volvulus*. The disease is transmitted by the blood feeding black fly, of the genus Simuliidae (1). Onchocerciasis is endemic in many tropical countries but mainly in the equatorial region of Africa. Out of the estimated 18 million infected people worldwide more than 80% live in Africa (2).

In Ethiopia, 3 million people are already infected, whereas 7.3 million are at risk of infection and almost everyone in an endemic village will harbor the disease. It is estimated that a child is bitten more than 20,000 times each year. Nine regions surveyed for river blindness including those that extend from the northwest to southwest part of the country bordering the Sudan were shown to be endemic areas(3). The disease manifestations are characterized by disabling intense itching and thickening of the skin, hanging groin.

Blindness, which is a common manifestation of the disease in West Africa, is a rare complication in Ethiopia (2).The prevalence of onchocerciasis in Ethiopia ranges from 85.3% in Teppi, to 6.9% in the Kuwara district of Northwest Ethiopia (4).

Ignorance and incorrect beliefs can lead to negligence in prevention, control measures and in accepting inappropriate treatment. Involvement of individuals and communities is an important component of onchocerciasis control activities. To attain community participation and design socially acceptable control strategies, health program planners and implementers must be familiar with people's knowledge and beliefs in relation to onchocerciasis.

1. Coffee Plantation Development Enterprise, Jimma, Ethiopia

2. Jimma University faculty of public health, department of epidemiology and Biostatistics, Jimma Ethiopia

3. Jimma University faculty of public health, department of population and family health, Jimma Ethiopia

4. Fayyaa Integrated Development Association-NCMI, PEPFAR-New Partners Initiative, Addis Ababa Ethiopia

There is paucity of information as few studies have been carried out to understand these issues. Therefore, this paper presents the results of investigation on people's knowledge and beliefs in relation to Onchocerciasis cause and transmission in rural areas of Southwest Ethiopia.

SUBJECTS AND METHODS

This cross-sectional study was conducted in Bebeke coffee plantation (farm), between February 1 and February 28, 2008. The study area is found in Southwest Ethiopia located 595 Kms away from Addis Ababa. The area is located between 1000 and 1350 ms above sea level with annual rainfall of about 1750 mm. There are two major rivers in the area that are responsible for vector Simuliidae (black flies) breeding namely; Aware and Gatcheb. The total population of the farm is 17164 (Bench-Maji zonal Economy & Finance Development Department, projected for the year 2007) that live in 20 villages.

As part of targeted elimination foci, annual mass treatment has been started in the plantation since 2003 by World Health Organization/African Program for onchocerciasis Control in partnership with Federal Ministry of Health, The Carter Centre, the local administration and the communities. To date, five treatment rounds have already taken place with Community Directed Treatment with Ivermectin strategy. The sample size was determined by assuming knowledge prevalence rate 50%, marginal error 5% and 95% confidence interval of certainty ($\alpha = 0.05$). Based on this assumption and a single population proportion formula the actual sample size for the study was calculated to be 384. As the source population is very mobile with in the plantation we had to consider 20 % for non-responses. Then the final sample size became 461.

Five villages were randomly selected among the 14 villages that had complete census data collected before the recent treatment round. Then from the treatment registration books of the selected villages, all individuals who were aged 15 and above and those who have been still living in the selected villages were sorted out and selected using simple random sampling procedure. A structured questionnaire was developed based on intensive literature review on the subject. The questionnaire was translated into Amharic and back-translated into English. To check for applicability in the local context it was pre-tested on areas not included in the study.

Data were collected by twelve high school completed and trained students who have prior experience in similar activities, using the pre-tested questionnaire of the Amharic version. During data collection all enumerators briefly described the study

objectives and procedures for every study participant and asked if they were interested in participating. Subjects who expressed interest in participating in the study were included in the study.

Data were coded and entered into SPSS for windows version 11.5, checked for outliers, inconsistencies and missing values.

For this study, individuals identifying themselves as having onchocerciasis were excluded on the assumption that responses from this group would be favorably biased. Knowledge was scored by giving 0 for incorrect answers and 1 for correct answers. Knowledge scores above the mean were considered 'high' while those below the mean were regarded as 'low'. Attitude scores were computed similarly, with scores above the median regarded as 'favorable' and those below as 'unfavorable'.

Ethical clearance was obtained from Jimma University ethical clearance committee of the faculty of public health. Permission was also sought from Bebeke coffee plantation administration and the plantation's labor union. Consent was obtained from every eligible before inclusion into the study by explaining the objective of the research. Privacy and confidentiality was ensured. After the end of the interview, data collectors provided important information regarding onchocerciasis mainly focusing on misperceptions and knowledge deficits observed during the interview with the respondent.

RESULTS

Out of the calculated 461 prospective respondents, 450(245 male, 205 Female) were interviewed in February 2008. The age of respondents ranged from 15-69 years, with the mean age of $31.5 \pm (SD-11.9)$ years. One hundred thirty three (30%) of the respondents did not attend formal education (Table 1).

All the 450 respondents had heard about onchocerciasis. Overall, 248 (55.3%) had at least one misconception about the cause of onchocerciasis including poor personal hygiene, hereditary and Sun scorching (Table 2). A range of misconceptions about mode of transmission including contact with infected person, airborne, sharing cloths and sexual contact were reported (Table 3).

Table 1. Socio-demographic characteristics of respondents (n=450), Bebek Coffee Plantation, February 2008.

Characteristics	Category	Frequency (%)
Age	35 and lower	305(68)
	36 and above	145(22)
Sex	Male	245(54)
	Female	205(46)
Current marital status	Married	297(66)
	Single	153(34)
Highest grade completed	No formal education	133(29)
	Primary education	175(39)
	Secondary & post Secondary	142(32)
Employment status	Non-employees	155(34)
	Employed	295(66)
Religion	Christians	418(93)
	Muslims	32(7)
Ethnicity	Endogenous ethnic groups	85(19)
	Non endogenous ethnic groups	365(81)
Duration of stay in Bebek	<10 years	30(7)
	≥10	420(93)
Monthly income	<500	374(83)
	≥501	76(17)

Ten percent knew that the disease is related with black fly breeding in fast flowing rivers and streams while, others indicated swampy areas, dirty places, forests and toilets as breeding sites. Nobody knew about the etiology (causative agent) of the diseases.

Table 2. Beliefs of respondents about the causes of onchocerciasis, Bebek Coffee Plantation, February 2008.

Cause	Frequency (%)
Black fly bite	227(48.4)
Unknown cause	169(36.0)
Mosquito bite	43(9.2)
Poor personal hygiene	8(1.7)
Sun Scorching	7(1.5)
Dirty things	4(0.9)
Witchcraft	3(0.6)
Hereditary	2(0.4)
Eating contaminated food	2(0.4)
Being not vaccinated	2(0.4)
Eating raw mango	1(0.2)
Exposure to draft	1(0.2)

Overall 397(88.2%) said that onchocerciasis is preventable; 47(11.8%) indicated use of bed net as the way of preventing onchocerciasis followed by killing black fly and wearing protective cloths (Table 4).

In multivariate analysis it was found that sex was the only factor associated with community knowledge of onchocerciasis: males were approximately 2 times more likely to have good knowledge than females or (1.79,95%: CI 1.21,2.66). Nearly three-fourth of

respondents 334 (74.5%) rated the severity of onchocerciasis as high. Two hundred sixteen (48%) rated the magnitude of onchocerciasis in their village as high and, 195 (43.3%) rated their risk of contacting

onchocerciasis is high (Table 5). Moreover, 295 (65.6%) of the study population agree that everyone in the villages is prone to infection.

Table 3. Beliefs of respondents about the Modes of transmission of onchocerciasis, Bebek Coffee Plantation, February 2008.

Mode of transmission	Frequency (%)
Black fly bite	224(49.8)
Unable to mention	136(30.2)
contact with infected person	48(10.7)
Mosquito bite	33(7.3)
Through breath	21(4.7)
Do not transmit	6(1.3)
Sharing clothes	4(0.9)
Sexual contact	2(0.4)

Table 4. Knowledge on methods of prevention of onchocerciasis among respondents, Bebek Coffee Plantation, February 2008.

What do you do to prevent Onchocerciasis?(n=397)	Frequency (%) †
Taking drug	376(94.7)
Using bed net	47(11.8)
Killing black fly	40(10.1)
Wearing protective clothes	30(7.6)
Environmental sanitation	8(2.0)
Personal hygiene	5(1.3)
No idea of what to do	5(1.1)

†Percents exceed 100% as there are multiple responses

DISCUSSION

The vast majority of people in the study communities are familiar with onchocerciasis; this is probably due to the endemicity of the disease in the study area that directly applies one of the commonest symptoms of the disease. In the area, the disease is called as '*yemiasakik yekoda beshita*' which means 'itching skin disease'. However, this study demonstrated lack of understanding of the cause and prevention methods of onchocerciasis. In this study, participants held at least one misconception about the cause of onchocerciasis. Consistent with the findings of this study, other studies have shown a wide range of misconceptions about the causes of onchocerciasis including adverse effect of the sun, hereditary, Witchcraft, excessive eating of cola nut and mosquito bites (5, 6). Many of these misconceptions were reflected in this study where some of respondents related onchocerciasis to poor personal hygiene, Sun scorching and hereditary. Nearly half of the respondents could

associate it with the bite of black flies, which is comparable to Ugandan study (46.7%) (7) and higher than the reports documented elsewhere in the region; 33% and 29.3% (8, 9). Almost half of the participants was incorrect or could not give any cause for '*yemiasakik yekoda beshita*'.

Similarly there are range of misconceptions about method of transmission including contact with infected person, airborne, sharing clothes and sexual contacts. Only 10% knew that black fly breeds in fast flowing rivers and streams, others indicated swampy areas, dirty places, forests and toilets as a breeding sites. Multivariate analyses showed that sex was the only factor associated with community knowledge on onchocerciasis: males were more than 2 times more likely to have knowledge than females. This variation may be attributed to high rate of the disease among males compared to females (51.7% Vs 22.6%) as indicated by previous study in the area (10).

Table 5. Risk perception towards Onchocerciasis, Bebek Coffee Plantation, February 2008.

How do you rate ...	Responses		
	High n (%)	Low n (%)	None n (%)
...your risk of getting Onchocerciasis?	195(43.3)	230(51.1)	25(5.6)
... the magnitude of Onchocerciasis in your village?	216 (48.0)	215(47.7)	19(4.2)
... the severity of Onchocerciasis?	334 (74.3)	105(23.3)	11 (2.4)

Though three-fourth of respondents rated the severity of onchocerciasis as high, only about half rated the magnitude of onchocerciasis in their village as high and, more than two-fifth rated their risk of contracting the disease is high. On the contrary, studies showed that the likelihood of an action like treatment intake would increase if the perceived threat of the disease is high (11).

In conclusion, though many people in the study communities are familiar with onchocerciasis most of them lack understanding about the cause and method of transmission of onchocerciasis with noticeable misconceptions in both issues. Moreover, most of them have regarded themselves as less prone to the infection.

This study revealed the need for increasing the awareness about onchocerciasis in the area through community-based campaigns. This will continue to enhance acceptance and support of the Community Directed Treatment with Ivermectin. Development of health education materials should focus on epidemiological information in order to ensure better understanding of individuals risk perception to the disease as far as they are living in the area.

ACKNOWLEDGEMENTS

The study was funded by Jimma University, Ethiopia. The authors thank all the residents of the study area and participants of this study as well as the Administration of Bebek coffee plantation, Bench- Maji Zone Health Office, Bench- Maji CDTI project office for their kind co-operation during data collection. The authors would also like to express deepest feeling to the department of Malaria and other vector borne diseases control, FMOH and the Carter Center national representative office for their encouragement and information supply.

REFERENCES

- Dadzie Y, Neira M, Hopkins D. Final report of the Conference on the eradicability of Onchocerciasis. *Filarial Journal*, 2003; 2(2): (Meeting Report)
- World Health Organization. Onchocerciasis control program, 2007; Available at: <http://www.who.int/countries/eth/areas/cds/onchocerciasis/en/>.
- Carter Center. Controlling River Blindness, 2007; Available at: <http://www.cartercenter.org/health/riverblindness/index.html>.
- Rasheed MU. Onchocerciasis in Different Regions of Ethiopia. *The Internet Journal of Parasitic Diseases*, 2007; 1(2): PP. 1
- Awolola TS, Manafa OU, Rotimi OO, Ogunrinade AF. Knowledge and beliefs about causes, transmission, treatment and control of human onchocerciasis in rural communities in south western Nigeria. *Acta Trop*, 2000; 76(3): 247–51
- Shu EN, Okonkwo PO, Onwujekwe EO. Health education to school children in Okpatu, Nigeria: impact on onchocerciasis-related knowledge. *Public Health*, 1999;113(3): 215–18.
- Lakwo, TL, Gasarasi DB. Non-adherence to community directed treatment with ivermectin for onchocerciasis control in Rungwe district, southwest Tanzania. *East Afr Med J*, 2006; 83(6):326-32
- Brieger, WR, Okeibunor JC, Abiose AO, Ndyomugenyi R, Kisoka W, Wanji S, Elhassan E, Amazigo UV. Feasibility of measuring compliance to annual Ivermectin treatment in the African Programme for Onchocerciasis Control. *Trop Med & Int Health*, 2007; 12 (2):260–268.
- Nuwaha F, Okware J, Ndyomugenyi R. Predictors of compliance with community-directed ivermectin treatment in Uganda: quantitative results. *Tropical Medicine & International Health*, 2005; 10(7): 659–667.
- Hailu A, Balcha F, Birrie H, Berhe N, Aga A, Mengistu G, Bezuneh A, Ali A, Gebre-Michael T, Gemetchu T. Prevalence of onchocercal skin disease infection among workers of coffee plantation farms in Teppi, southwestern Ethiopia. *EMJ*, 2002; 40(3), 259-69.
- Carpenter R. Perceived threat in compliance and adherence research. *Nurs Inq*, 2005; 12(3):192-199.