

Knowledge, Attitude and Practice About Malaria, the Mosquito and Antimalarial Drugs in a Rural Community

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Abstract

Background: Community perceptions relating to causation, diagnosis, treatment and prevention are the main socio-cultural factors which can influence malaria prevention and control.

Objective: To assess the knowledge, attitudes and practices of a rural community on malaria, the mosquito vector and antimalarial drugs.

Methods: A cross-sectional study of 630 randomly selected rural households was carried out in 6 peasant associations' of Butajira District in southern Ethiopia between January and September 1999.

Results: Fever, headaches, chills and shivering were the most frequently mentioned symptoms of malaria reported by 89.7%, 87.5% and 81.3% of the study subjects, respectively. About 66% of the study community related the mode of transmission to the bite of infective mosquitoes and 43.7% of them believed that malaria could be transmitted from person to person through the bite of mosquitoes. Mosquitoes are mainly believed to bite human beings at night (73.2%), breed in stagnant water (71%) and rest in dark places inside houses during daytime (44.3%). Malaria was thought to be preventable by 85.7% of the respondents. Of them, 62.4% reported chemoprophylaxis, 39.6% mentioned indoor residual spraying and 25% indicated eliminating breeding sites as preventive methods. The use of modern drugs for malaria was high (92%) including chloroquine (73.5%) and Sulfadoxine-Pyremethamine (60.6%). Chloroquine was believed to be effective for the treatment of malaria by 59% of the respondents, while the remaining replied that it was ineffective. Four hundred two (63.8%) respondents reported Sulfadoxine-Pyremethamine to be the most effective antimalarial drug for the treatment of malaria in contrast to others.

Conclusions: Study subjects are familiar with the symptoms of malaria and to a lesser degree, are aware of an association between mosquito and malaria. Health workers at different levels of the health care delivery system should disseminate relevant information about malaria to help community members to be involved more in malaria control. [*Ethiop.J.Health Dev.* 17(2):99-104]

Introduction

Malaria is one of the most important causes of morbidity and mortality in the world, and remains not only a major cause of much suffering and death, but also the cause of many social and economic problems (1,2). Malaria causes over a million deaths each year, and more than 90% of these occur in Africa south of the Sahara (3). In recent years, the region has

experienced a dramatic resurgence of this disease and almost with up to 450 million clinical cases of malaria recorded each year. Malaria is responsible for 30-40% of outpatient visits to health facilities, 10-20% of hospital admissions and 10-40% of severe cases in children under five years (4). Today malaria is the top killer disease in sub-Saharan Africa.

In Ethiopia, malaria is at the forefront among the health problems of the country. Due to climatic and geographic factors, the disease occurs in different parts of the country in epidemic form. About 75% of the total area is estimated to be malarious with 65% of the total

population, 40 million people, being at risk of infection (5). The actual number of malaria cases that occur annually throughout the country are estimated to be about 4-5 million (4).

Community perceptions relating to causation, transmission, prevention and treatment are the main socio-cultural factors that can influence malaria control (6). The success of malaria control programmes at present relies heavily on community perceptions and practices in the transmission, treatment and control of the disease. Incorrect beliefs or inappropriate behaviour can interfere with the effectiveness of a control measure, such as vector control or chemotherapy. These issues are particularly important in tropical areas where malaria control options are limited because of the parasite and vector resistance to antimalarial drugs and insecticides, respectively. In such cases, an understanding of the communities' beliefs and behaviour may be crucial to the success of specific control measures.

For the participation of the community to be meaningful, the views of the community should be sought and incorporated into any control measures. However, studies done on community knowledge and perception on malaria are scarce in Ethiopia. Therefore, the present study was undertaken to assess the knowledge, attitudes and practices of a rural community on malaria, antimalarial drugs and the mosquito vector. The information generated in the current study would help in designing and evaluating malaria control strategies.

Subjects and Methods

Study areas and population: The study was carried out between January and September 1999 in 6 peasants' associations (PAs) of Butajira District (Meskenena Mareko *wereda*) in southern Ethiopia. The 6 PAs included 4015 households with about 19,172 inhabitants. The District is located at altitudes ranging from 1500 m to 2300 m above sea level (7). Most of the rural populations are engaged in subsistence farming. Maize and *enset* (false banana) are the

main crops cultivated. The major ethnic group is Gurage. Malaria is a highly endemic disease and ranks top in the list of the ten leading causes of morbidity in all public health institutions in the District.

Study design and sampling techniques: The design of the study was descriptive cross-sectional. Randomly selected households with malaria cases within the previous 6 months were the study population. The sample size (n) was determined by using the formula for estimating a single proportion, and the total sample size was 630 after adding a 5% contingency. From the 10 PAs of Butajira Rural Health Program (BRHP) demographic surveillance study-base (7), six were selected based on the endemicity of malaria. The two PAs are located in midland areas, while others in lowland areas. From the list of households with malaria cases in each of the six malarious PAs, study households proportional to the size of households with malaria cases per PA were randomly selected.

Data collection and analysis: Data were collected in May 1999 using a structured questionnaire specifically developed for this purpose. The heads of the households, or in their absence the next responsible persons, were interviewed. Most questions were closed-ended in structure. Data collectors were interviewers of the BRHP residing in the study areas. Data thus collected were entered and analysed using EPI INFO version 6.02 software package.

Results

The study consisted of 329 (52.2%) males and 301(47.8%) females of the total 630 study subjects. The ages of the subjects ranged from 18 to 85 years with mean (SD) and median ages of 35.26 (12.8) and 33 years, respectively. Most of the respondents were Muslims (71%), illiterate (69.7%), farmers (50.6%), housewives (41.1%) and married (77%).

Fever, headaches, chills and shivering were the most frequently mentioned signs and symptoms of malaria reported by 89.7%, 87.5%, and

81.3% of the study subjects, respectively (Table 1).

Table 1: Knowledge about the symptoms and causes of malaria (n=630), Butajira District, Southern Ethiopia, 1999.

Variables	Frequency (%) ^a
<i>Signs and symptoms</i>	
Fever	565(89.7)
Headache	551(87.5)
Chills and shivering	512(81.3)
Thirsty and poor appetite	417(66.2)
Joint and body pains	239(37.9)
Vomiting	173(27.5)
Diarrhoea	22(3.5)
Others	18(2.9)
<i>Causes</i>	
Mosquito bite	375(59.5)
Cold, wet weather or change in weather	132(21.0)
Dirty stagnant water	105(16.7)
Dirty personal and sanitary condition	18(2.9)
Sick people	13(2.1)
Contaminated food and drinking water	5(0.8)
Don't know	86(13.7)
Others	6(1.0)

^a Percents totally exceed 100% because of multiple responses

About sixty percent of the study subjects associated the causes of malaria to the bite of mosquito, while other respondents associated it to exposure to cold, wet weather or change in weather and dirty stagnant water.

Regarding malaria transmission, only 43.7% of the study subjects believed that malaria could be transmitted from person to person. When asked about how someone is infected with malaria, 65.6% mentioned the bite of infective mosquitoes (Table 2). Nearly 10% of the respondents related it to a close contact with a patient having malaria, while 13.2% of them associated it with insanitary living conditions. These included drinking unsafe water, eating contaminated food and exposure to a bad odour. Mosquitoes are mainly believed to bite human beings at night (73.2%) and rest in dark places inside houses during daytime (44.3%). The study subjects also thought that mosquitoes

rest at the edges of streams (17.3%) and on dirty areas (4.1%).

Table 2: Knowledge and attitude regarding malaria transmission and the habits of mosquito vector (n=630), Butajira District, Southern Ethiopia, 1999.

Variables	Frequency (%)
Mode of transmission ^a	
Bite of infective mosquitoes	413(65.6)
Close contact with malaria patient	62(9.8)
Unsafe drinking water	44(7.0)
Bad odor	31(4.9)
Eating contaminated food	8(1.3)
Don't know	95(15.1)
Others	7(1.1)
Usual biting time	
Day	6(1.0)
Night	461(73.2)
Any time	67(10.6)
Don't know	96(15.2)
Common breeding sites ^a	
Stagnant water	447(71.0)
Running water	18(2.9)
Others	51(8.1)
Don't know	128(20.3)
Common resting sites ^a	
Dark places inside houses	279(44.3)
At edges of streams	109(17.3)
Dirty areas	26(4.1)
Others	29(4.6)
Don't know	201(31.9)

^a Percents totally exceed 100% because of multiple responses

Four hundred ten (65.1%) of the respondents thought that both infants and children suffer frequently from malaria, while 43.2% thought pregnant women suffer most from malaria and 6.5% mentioned adults and others to be suffering from malaria. Malaria was thought to be preventable by 85.7% of the respondents (Table 3).

Table 3: Knowledge and attitudes about preventability and preventive methods of malaria (n=630), Butajira District, Southern Ethiopia, 1999

Variables	Frequency (%)
Malaria is preventable	
Yes	540(85.7)
No	64(10.2)
Don't know	26(4.1)
Preventive methods	
Chemoprophylaxis	337(62.4)
DDT Spraying	214(39.6)
Eliminating mosquito breeding sites	135(25.0)
Protection from mosquito bite and bednet use	70(13.0)

^a Percents totally exceed 100% because of multiple responses

Among those who believed that malaria is preventable, 62.4% reported chemoprophylaxis, 39.6% mentioned residual indoor house spraying and 25% indicated eliminating breeding sites as preventive methods.

Regarding knowledge on traditional medicine, leaves such as *Carica papaya*, roots and herbs like garlic were believed to be used for the treatment of malaria by 32.2%, 3.8% and 2.1% of the respondents, respectively (Table 4).

Table 4: Knowledge and practices about traditional and modern antimalarial drugs, Butajira District, Southern Ethiopia, 1999.

Types	Knowledge	Practice
	Frequency (%) ^a	Frequency (%) ^a
Traditional remedies	N=630^b	N=51^b
Leaves	203(32.2)	41(80.4)
Roots	24(3.8)	5(9.8)
Herbs	13(2.1)	12(23.5)
Holy water	2(0.3)	0
Don't know	390(61.9)	-
Others	36(5.7)	4(7.8)
Modern drugs	N=630^b	N=622^b
Chloroquine	476(75.6)	457(73.5)
SP	426(67.6)	377(60.6)
Primaquine	71(11.3)	45(7.2)
Don't know	53(8.4)	41(6.6)
Others	10(1.6)	4(0.6)

^a Percents totally exceed 100% because of multiple responses

^b Number varies due to skipping patterns

With regard to the knowledge about the modern antimalarial drugs, 75.6%, 67.6% and 11.3% mentioned chloroquine, Sulfadoxine-Pyremethamine (SP) and primaquine, respectively.

For the recent illness, most of the respondents (91.9%) used only modern antimalarial drugs, 6.8% replied both modern and traditional medicine, while 1.3% used only traditional medicine. Among those who used modern antimalarial drugs, 73.5% said they used chloroquine and 60.6% used SP (Table 4). Four hundred two (63.8%) respondents reported SP to be the most effective antimalarial drug as compared to chloroquine (18.1%). Of those respondents who used traditional medicine (8.1%), leaves were used by 80.4%, followed

by herbs (23.5%) and roots (9.8%). Two (3.9%) used homemade liquor for the treatment of malaria. Among those who used only traditional medicine, 3 believed that it was more effective than modern, while 4 said modern antimalarials were expensive.

Discussion

The results showed that knowledge about the symptoms of malaria and the use of modern antimalarials drugs was very high. All of the study subjects had knowledge of at least one of the classical symptoms. The knowledge about the symptoms of malaria is usually high in endemic areas where people are aware of the clinical manifestations of the disease. However, in a holo-endemic area of western Kenya only approximately 30% of the respondents were aware of malaria symptoms (8). This is very low compared to our findings because malaria may not be considered as a major health problem in the latter community. The communities in the current study are located in an area of unstable or seasonal malaria where the individuals recognize the clinical manifestations of malaria (5).

With respect to the causes of malaria, most of the study subjects implicated mosquito bite as a possible cause of malaria and indicated that people are infected with malaria by the bite of infected mosquitoes. This awareness in the present study is much higher than the level noted in a study conducted in central Ethiopia (9) and a similar study carried out in Kenya (8). This could probably be due to different malaria control interventions undertaken in the current study over the last periods since these studies were undertaken in different times. In Guatemala, however, more than 90% of the informants knew that mosquitoes transmit malaria (10) and 93% of the residents believed that a bite of mosquito that has bitten a malaria patient could cause malaria (11).

Other implied causes of malaria included cold, wet weather or change in weather, dirty stagnant water, and poor personal and sanitary condition. In a study in central Ethiopia, the

causes of malaria other than mosquito bite as understood by women also included cold cloudy weather, rain, eating maize stalk, and dirt and flies (9). In a Kenyan study, a considerable number of respondents related the causes of malaria to practices such as walking in cold water, nearby rivers and in flood waters (8). Although these might seem inconceivable, the association of malaria to cold, wet and water coincides with the abundance of mosquito breeding sites, which may be an indication for the relationship between mosquito and malaria. In Ethiopia, the peak malaria transmission coincides with the appearance of stagnant water collections just after the rainy season.

Mosquitoes are mainly thought to bite people during night time. Stagnant water was identified as the main mosquito breeding site. This is in agreement with the findings of other studies (8,10). Knowledge about breeding site of mosquitoes is high in all studies. Mosquitoes are thought by a considerable number of study subjects to rest mainly in dark places inside houses during daytime. The results of the current study are also consistent with the Kenyan study (8).

The knowledge about the transmission of malaria from person to person through mosquito bite is low when compared to the results of a study in central Ethiopia (9). On the preventability of malaria, however, most of the present study population believed that malaria is a preventable disease in contrast to the findings of the above study in central Ethiopia. This could be explained by the fact that the activities of Malaria Control Program to prevent and control the disease in the area for the last several years might have enhanced their knowledge on the preventability of malaria and its preventive measures. This difference could also be attributed to the higher educational status of the present study population (30%) compared to the study in central Ethiopia (16.7%) (9). In addition, all the study populations involved in the study conducted in central Ethiopia were women, while about 48%

of the study subjects were women in the present study. Generally, in rural communities the literacy rate in men is higher than that of women.

The knowledge of modern treatment for malaria in this study is high as was reported in the study at central Ethiopia (9). This knowledge of the modern antimalarials seemed to be related to the use of these drugs. SP was described as fansidar by the study subjects and seemed to be more popular at the time of survey compared to chloroquine and primaquine. The respondents usually described chloroquine as a white bitter tablet administered over three days, and primaquine by its red colour and small size. In a study of child malaria treatment practices among mothers in Kenya, most mothers mentioned the names of over-the-counter antimalarial drugs, but all could not specify the names of the medications they used (12). None of the women in the study conducted in the central Ethiopia could specifically mention chloroquine, the widely used drug in the area, mainly due to little or poor inclination to know the specific names of drugs (9).

The use of modern antimalarials drugs over the traditional remedies is very high in this study. This could be attributed to the long duration of malaria control activities in these areas and the ease accessibility of antimalarial drugs from different sources. Another important finding in this study is that the respondents knew about the most effective antimalarial drug for the treatment of malaria. SP was mentioned as the most effective drug compared to chloroquine and primaquine. Chloroquine was thought to be ineffective against the treatment of malaria by 41% of the study population. An overall chloroquine resistant *P. falciparum* was reported among 55.6% of the study subjects around Zewai (13). The treatment of malaria with chloroquine failed to produce acceptable improvement in majority of patients in most parts of Ethiopia and has been replaced by SP as a first-line drug for the treatment of uncomplicated falciparum malaria (14).

In conclusion, study subjects are familiar with the symptoms of malaria and to a lesser degree, are aware of an association between mosquito and malaria. Health workers at different levels of the health care delivery system should disseminate relevant information about malaria and mosquito vector within the community. They also need to encourage stronger linkages between communities with a view to extend control measures beyond treatment to other issues like environmental management and insecticide treated mosquito nets. All these depend in part on providing people with relevant information on malaria transmission, treatment and prevention. Effective communication between the health care providers and the community will help community members to be involved more in malaria control.

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References

1. Breman, JG., and Campbell, CC. Combating Severe Malaria In African Children. *Bulletin of the World Health Organization*. 1988; 66(5): 611-620.
2. Snow, RW., Azevedo B., Lowe BS., Kabiru EW., Nevill CG., Mwankusye S., et al. Severe childhood malaria in two areas of markedly different *falciparum* transmission in east Africa. *Acta Tropica*. 1994; 57: 289-300.
3. World Health Organization. A Global strategy for malaria control. Geneva, Switzerland, 1993.
4. Ministry of Health. Proceedings of the national conference on roll back malaria in Ethiopia. Addis Ababa, 2000.
5. Tulu, AN. Malaria. In: Kloos, H. and Zein, ZA., eds. The ecology of health and disease in Ethiopia. Boulder, Westview Press, 1993, 341-352.
6. Agyepong, IA. Malaria: Ethnomedical perceptions and practice in an Adange farming community and implications for control. *Soc. Sci. Med.* 1992; 35(2):131-137.
7. Shamebo D. Epidemiology for public health research and action in a developing society. *Ethiop. J. Health. Dev.* 1994; Special issue, Vol.8.
8. Ongore, D., Kamunvi, F., Knight, R. and Minawa, A. A study of knowledge, attitudes and practices (KAP) of a rural community on malaria and the mosquito vector. *East Afr Med J.* 1989; 66(2):79-89.
9. Yeneneh, H., Gyorkos, TW., Joseph, L., Pickering, J. and Tedla, S. Antimalarial drug utilization by women in Ethiopia: a knowledge - attitudes - practice study. *Bulletin of the World Health Organization*. 1993;71(6): 763-772.
10. Klein, RE., Weller, SC., Zeissig, R., Richards, FO. and Ruebush II., TK. Knowledge, beliefs, and practices in relation to malaria transmission and vector control in Guatemala. *Am. J. Trop. Med. Hyg.* 1995; 52(5): 383-388.
11. Ruebush II, TK., Weller, SC. and Klein, R. Knowledge and beliefs about malaria on the Pacific Coastal Plain of Guatemala. *Am. J. Trop. Med. Hyg.* 1992; 46(4): 451-459.
12. Mwenesi, H., Harpham, T., and Snow, RW. Child malaria treatment practices among mothers in Kenya. *Soc. Sci. Med.* 1995; 40(9): 1271-1277.
13. World Health Organization. Re-orientation and definition of the role of malaria vector control in Ethiopia. WHO/MAL/98.1077. Geneva, Switzerland, 1993.
14. Ministry of Health. Malaria diagnosis and treatment guidelines for health workers in Ethiopia. Addis Ababa, 1999.

