PREVALENCE OF MALARIA AMONG PATIENTS REQUESTED FOR BLOOD FILM EXAMINATION AT SHANAN GIBE HOSPITAL, JIMMA TOWN, SOUTH WEST ETHIOPIA

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ABSTRACT

- **Background**:Malaria is a major public health problem and cause of much suffering and premature death in poorer areas of tropical Africa,Asia and Latin America. The agents of human malaria are four species of the genus plasmodium:-pv,pf,pm and po. Female anopheles mosquitoes the is the primary vector for malaria.
- **Objectives**: To determine prevalence of Malaria among patients requested for blood film examination at Shanan Gibe Hospital , Jimma Town, South West Ethiopia
- **Method**: A cross sectional health institution based study was conducted in Shanan Gibe Hospital from February 10 to 25, 2013

Data on socio demographic and factors associated with Malaria transmission was collected using a structured questionnaire that has been prepared in Afan Oromo and Amharic and that was administered by interviewing.

Microscopic examination for Malaria parasites was done on thick and thin blood film prepared from Capillary blood specimens that was stained with Giemsa stain.

Quality control measure was under taken at every stages of the procedure.

- **Result**: Out of 142 patients whose BF was examined,67 and 75 were males and females respectively. The prevalence of malaria was 23(16.2%) and from this 11(47.8%) and 12(52.2%) were males and females respectively. pv was the most dominant 18(78.3%) followed by pf which was 4(17.4%) and mixed infection was 1(4.3%). The age of the population ranges from 0.5 to 65 years with the peak age between 25-29 followed by 0-4.

- **Conclusions:** The overall prevalence of malaria infection obtained in this study was 16.2% and it is significantly associated with the presence of stagnant water in the community area. P. vivax was the most dominant (78.3%), followed by p.falciparum which was (17.4%) and mixed infection (4.3%).The prevalence was high in females than males.The majority of patients are within the age 15 to 19.

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OPERATIONAL DEFINITIONS

Parasite: An organism that obtain food and shelter from other Hosts.

Prevalence: A magnitude of total number of existing cases or event of the diseases or condition at specified point in time

Endemic: A Disease that occur persistently n a given population over a period of time in a given geographic area.

Epidemic: The occurrence of outbreak of diseases in highest within a given population

Risk factors: factors whose presence increase the probability of the diseases to occur in the future.

Species: A naturally interbreeding organism

Illiterate: A person who cannot read or write or cannot do both.

Literate: A person who can read or write or can do both.

ABBREVIATIONS

ITBN - Insecticide Treated Bet Net

PF - Plasmodium Falciparum

PM - plasmodium Malariae

PO - Plasmodium Ovale

HPF - High Power Field

PV - Plasmodium Vivax

QA - Quality Assurance

RBC - Red Blood Cell

SNNPR - South Nations and Nationalities People of Representative

SOP - Standard Operational Procedure

WHO - World Health Organization

CHAPTER ONE: INTRODUCTION

1.1 Background

Malaria is a major public health problem and cause of much suffering and premature death in the poorer areas of tropical Africa, Asia and Latin America. Africa, especially sooty of the Sahara, is the most affected continent, bearing of the global deaths due to malaria (1).

The agents of human malaria are four species of the genus plasmodium:- plasmodium vivax, plasmodium falciparum, plasmodium malariae and plasmodium ovale. Pv accounts for vast majority of malarial infection mainly because of worldwide distribution of the parasite. pv is the only one of the four species that extends through tropical, subtropical and temperate regions. Pf which causes falciparum infection is continued to the tropical and subtropical regions and is probably the worst lethal form of malaria. Pockets of plasmodium malariae infection are distributed throughout the tropics and sub tropics. While plasmodium ovale is primarily continued to tropical West Africa, South America and Asia (2) .

The Anopheles mosquito serves as the primary vector for malaria. The risk of the infection is determined by the number and specie of mosquitoes presents in a given area as well as the climate and geography. In many parts of the world transmission of malaria concerns with the rain season when mosquitoes' thrive and there is increased agricultural activity. Population shifts caused by political unrest, climatic events and environmental changes brought on by urbanization, deforestation and forced irrigation have all contributed to the increased incidence of malaria (2).

Malaria is treated with ant malarial drugs. A combination drugs is often needed to completely cure malaria. Ant malarial drugs include. Arlemether-lumefantrin (Coartem). Atovaquone –proguanil (Malaren). Chloroquine, Mefloquine (Lariam) , Quinidine Quinine, etc Severe cases of malaria and the life thremenimg complications of severe anemia and falciparum malaria require hospitalization and intravenous admimstartion of ammalarial dings (3)

Malaria is transmitted through the bite of an infected female anopheles mosquito , which usually feed between sunset and sunrise. The anopheles itself becomes infected by taking in parasites after feeding on the infected human blood. The parasite then develops inside the mosquito and about a week later can be transferred to a new host when the mosquito feed again (4).

Malaria transmission in Ethiopia is seasonal, depending mostly on altitude and climate (rainfall and temperature). Transmission is seasonal and largely unstable in character. The major transmission season follows the June-September rains and occurs between September and December, while the minor transmission season occurs between April and May following February- March rains. Areas with bimodal pattern of transmission are limited and restricted to a few areas that receive the small (Belg) rains. The major transmission season occurs almost in every part of the Country (6,7)

Plasmodium has a complex life cycle involving both sexual and asexual life cycles. The asexual life cycle of these parasites is called Schizogony takes place in human host and the sexual life cycle called sporogony takes place in the gut of female anopheles mosquito. The sporozoites are infective to humans where as gametes are infective stage to the Vector. The female anopheles mosquito injects sporozoites during blood meal which to the blood stream of human host and then migrate to the Liver where they infect the hepatic parenchyma cells. After proliferation of the parasite, the cells rupture and releases merozoites to the blood stream which infects RBCs (1). Malaria is typically diagnosed by the microscopic (which is the gold standard method) using blood using blood film or with Antigen-based rapid diagnostic tests. Modern tests that use PCR to detect the parasites DNA have also been developed, but, these are not widely used in Malaria endemic areas due to their cost and complexity (5).

1.2. Statement of the Problem

Malaria is the World's most important causes of mortality and morbidity and remains a major causes of much suffering and deaths; Malaria cause over a million death each year (90% of them in Africa)(8). Nigeria, democratic republic of Congo (DRC), Ethiopia and Uganda accounts for nearly 50% of the global malaria deaths (9).

Malaria affects 3.3 billion people or half of the world's population in 106 countries and territories. WHO estimated 216 million cases of malaria occurred in 2010, 81% in the African region and there were 655,000 deaths of Malaria in 2010, 91% in the African region and 86% were children under five years old. Malaria is the third leading causes of deaths in fewer than five children Worldwide, after Pneumonia and Diarrheal diseases; and the second leading causes of deaths from infectious diseases in Africa after HIV/AIDS. Almost one out of five deaths of children under five in Africa is due to Malaria (9).

Malaria is almost a significant impediment to Socio-economic development in Ethiopia. Fertile low lands and major river valleys have not been fully inhabited and developed largely due to the fear of Malaria in these areas, the population have been settled largely on the high lands ;this has caused over population , ecological degradation reduced productivity and hence famine and poverty(7,8).

1.3. Significance of the Study

This Study determined the prevalence of Malaria among patients visiting Shanan Gibe Hospital. Result of local distribution of malaria parasite was known which helps for further epidemiological measures or studies and also provided valuable information on the burden of malaria for both the community and responsible bodies;which helps in early management of the diseases through combined effort of the community and all responsible bodies of the area.

CHAPTER TWO: LITERATURE REVIEW

A Malaria prevalence survey carried out in thirteen Malaria endemic districts of Bangladesh show an overall prevalence of 3.39% prevalence. Among districts, five South-Eastern districts weighted average malaria prevalence rate was 6.00% and in eight north –Eastern districts weighted average malaria prevalence rate was 0.40%. The majority of cases (90.18) were p. falciparum infections. A malaria morbidity rate in five South – Eastern districts was 2.94%. in eight North- Eastern districts morbidity was 0.07%(10).

In India about 2 million Malaria cases and 1000 deaths are reported annually, although 15 million cases and 20,000deaths are estimated by WHO South East Asia regional office. India contributes 77% of the total malaria in South East Asia (11).

Various studies and surveys have been conducted in different parts of Africa. A cohort of Malaria incidence and prevalence carried out over three cross sectional surveys on 553 children living in peri-urban areas on the coast of Benin, West Africa showed that over all p. falciparum incidence rate was estimated at 84/1000 person months, and its prevalence was estimated at over 40% in two first surveys and 68.9% in the third survey. Multivariate analysis indicates girl and people living in closed house had a lower risk of clinical malaria infection (12).

In countries where Malaria is endemic, there is a risk of Malaria transfusion through blood transfusion which could lead to serious complication. In Sudan a study done on 1564 blood donors showed that the prevalence of infected donors was predominantly those aged between 20 and 40 years (6.5) which is the required age for blood donation. The dominant species identified were p. falciparum (98.1%) and p. vivax which was (1,9%) (13).

Another survey from Zambia conducted to examine the relationship between insecticide-treated mosquito nets (ITNS), malaria parasite infection and severe anemia prevalence in children of Luangwa district, at the end of 2008 and 2010 malaria transmission seasons indicated that malaria prevalence among children of under five years old was 9.7% over both survey areas. Prevalence o severe anemia among 6-59 months old was 6.9% over both survey years. Over all 38.5%of children with severe anemia also had a malaria parasite infection, where as 26.3% of children with a malaria parasite infection also had severe anemia (14).

Furthermore, a parasitological cross sectional survey under taken from September 2000 through 2001 to estimate the prevalence of malaria parasitemia in Eritrea examined t total of 12,937 individuals from 176 villages. It showed low malaria prevalence with the proportion of parasitemia at 2.2% (range 0.4% to 6.5%). 7% of households accounted for the positive cases and 90.4% of these were p. falciparum and9.6% p.vivax(15).

Malaria is ranked as a leading communicable in Ethiopia, accounting for about 30% of the overall disability adjusts life years a lost. Approximately 75% of the country is malarious with about 68% of the total population is living in the area at risk of malaria, malaria reported to cause 70,000deaths each year (16).

In Northern Ethiopia a study conducted in Gondar town an assessment of malaria prevalence and knowledge , attitude and practice towards malaria prevention and control showed that among 735 examined blood films , 39(5.3%) were positive for malaria infection of which 29(74.4%) were due to p. falciparum and 10(25.6%) due to p. vivax(16).

A study done in Oromia and SNNPR to determine malaria prevalence and mosquito net coverage showed that overall 47.5% of house-holds had at least one net , and 35.1% had at least one 'long lasting insecticide nets'(LLIN). There were no differences in net ownership or net utilization between the two regions. Malaria parasite prevalence was 2.4% overall, but differed markedly between the two regions; Oromia, 0.9%; SNNPR, 5.4%. This difference between the two regions was also reflected in the routing surveillance data (17).

The study conducted in Jimma town on a total of 804 study participants , the prevalence of malaria was 5.2% and plasmodium vivax the dominant species seen with the prevalence of 71.4% followed by p. falciparum (26.2%) and mixed infection (2.4%) (18).

CHAPTER THREE

3. OBJECTIVE

3.1. General Objective

❖ To determine the prevalence of Malaria among patients requested for blood film examination at Shanan Gibe Hospital from February 10 to 25,2013

3.2. Specific objectives

❖ To determine the association between the risk factors and the prevalence of the malaria infection

❖ To determine the type of plasmodium species that is the most the most dominant in the study area.

❖ To put base line data for further investigation.

CHAPTER FOUR

4. METHODOLOGY

4.1. Study Area

The study was carried out in Shanan Gibe Hospital, Jimma town. Jimma town is one of the known towns in Ethiopia with the total population of about 128,330. The town is located about 350 km from Addis Ababa to the South West. The town geographical coordinates are 7°9 41' N latitude and 36°50' E longitude. The town is found at the altitude of 1763 m above sea level. It has the climatic condition of most of the area that is "Woyna Dega" and characterized by warm climate with a mean annual maximum temperature of 30° c and minimum of 14 °c. The annual rain fall ranges from 1138-1690mm.

4.2. Study Design and Study Period

A cross sectional health institution based study was conducted in Shanan Gibe Hospital, Jimma town , South West Ethiopia , from February 10 to 25,2013

4.3. Population

4.3.1. Source of Population

All patients who was come to Shanan Gibe Hospital during the study period.

4.3.2. Study population

Patients requested for blood film examination in Shanan Gibe Hospital during the study period.

4.3.3. Study Subjects

Patients requested for blood film examination in Shanan Gibe Hospital during the study period and met inclusion criteria

4.4. Sampling Technique

- Convenient Sampling technique was used using the study population.

4.5. Sample Size Determination

The total sample size is calculated as follows:

$$n = \frac{\left(Z_{\alpha/2}\right)^2 p(1-p)}{d^2}$$

n=minimum sample size

p=the expected proportion rate of the parasite around Jimma = 10.3% (18)

d= marginal error- taking 5%.

$Z_{\alpha/2}$ =1.96 at 95% confidence level.

$$n = \frac{(1.96)^2 \quad 0.103(1-0.103)}{(0.05)^2}$$

Hence, n = 142

4.6. Study Variables

4.6.1. Dependent Variables

- Malaria prevalence
- Plasmodium Species

4.6.2. Independent Variables

- Sex
- Age
- Usage of bed net
- Residence
- Occupation
- Educational status
- Presence of stagnant water
- Spray coverage

4.7. Data collection, Sample preparation and Processing

The socio-demographic data of the patients (age, gender) and risk factors such as bed net utilization, presence of stagnant water was collected by using well developed questionnaire. Capillary/dermal blood collection was performed by using aseptic techniques. Patient identification, Specimen labeling and microscopic Examination was done carefully. Laboratory investigation results was recorded by using well structured report format.

4.8. Ethical Consideration

The study was done after gaining a full approval student's research Project office and the permission was assured from responsible authority of the study area. The objectives as well as the nature of the study were explained to the concerned body.

4.9. Quality Assurance

To assure the reliability and validity of the study, the following quality phases was done carefully.

4.9.1 Pre-Analytical Stage

- ✓ Appropriate Reagent and equipment was used.
- ✓ Quality of stain was checked before the actual work has started.
- ✓ Questionnaire and other instruments was pre-tested before data collection.

4.9.2. Analytical Stage

- Thin and thick smear weas prepared.
- Microscopic examination of full smear was done systematically to examine the whole slide.
- Well prepared SOP was followed throughout the study.

4.9.3. Post –Analytical Stage

- ✓ Results was recorded and interpreted correctly.
- ✓ The left over specimens was discarded in the prepared container.
- ✓ The questionnaire and slide was kept for re-checking by well experienced person.

4.10. Pre-test

Structured questionnaire was re-checked on random selected patient before going to actual work.

4.11. Data processing and Analysis

The raw data was processed and analyzed by using scientific calculator and chi-square was carried out to see the associated between its risk factor by considering $p<0.05$.

CHAPTER FIVE

RESULTS

The overall prevalence of malaria in this study was 16.2%.Out of the total patients whose Blood film was examined, 67(47.2%) were male and 75(52.8%) were female. The prevalence of malaria was 23(16.2%); from which 11 (47.8%) were male and 12(52.2%) were female. P.vivax was the most dominant 18(78.3%) followed by p.falciparum which was 4(17.4%) and the remaining 1(4.3%) was mixed infection. The age of the study population was from 0.5 to 65 years, with the peak of age between 25-29 followed by 0-4 years old. The prevalence of malaria was high among housewife and students with equal number and prevalence of malaria was significantly associated with the presence of stagnant water and the habit of using bed net.

Table 1: Distribution of Malaria prevalence in relation to sex among patients requested for blood film examination in Shanan Gibe Hospital, Jimma town, South West Ethiopia from February 10 to 25,2013

Sex	Malaria					
	Positive		Negative		Total	
	No	%	No	%	No	%
Male	11	7.8	56	39.4	67	47.2
Female	12	8.4	63	44.4	75	52.8
Total	23	16.2	119	83.8	142	100

Out of the total patients whose Blood film was examined, 67(47.2%) were male and 75(52.8%) were female. The prevalence of malaria was 23(16.2%); from which 11 (47.8%) were male and 12(52.2%) were female.

Table 2: Distribution of Malaria prevalence in relation to age among patients requested for blood film examination in Shanan Gibe Hospital, Jimma town, South West Ethiopia from February 10 to 25, 2013

Age	Malaria					
	Positive		Negative		Total	
	No	%	No	%	No	%
0-4	4	2.8	24	16.9	28	19.7
5-9	2	1.4	8	5.6	10	7.0
10-14	2	1.4	7	4.9	9	6.3
15-19	2	1.4	20	14.1	22	15.5
20-24	3	2.1	14	9.9	17	12.0
25-29	5	3.5	16	11.3	21	14.8
30-34	0	0.0	5	3.5	5	3.5
35-39	2	1.4	4	2.8	6	4.2
40-44	1	0.7	5	3.5	6	4.2
45-49	1	0.7	9	6.3	10	7.0
50-54	0	0.0	4	2.8	4	2.8
55-59	0	0.0	1	0.7	1	0.7
60-64	1	0.7	1	0.7	2	1.4
>65	0	0.0	1	0.7	1	0.7
Total	23	16.2	119	83.8	142	100

Table 3: distribution of Malaria in relation to Residence among patients requested for blood film examination in Shana Gibe Hospital , Jimma town, South West Ethiopia, from February 10 to 25,2013

Residence	Malaria						
	Positive		Negative		Total		p-value & X^2
	No	%	No	%	No	%	P-value=0.937
Urban	18	12.7	94	66.2	112	78.9	
Rural	5	3.5	25	17.6	30	21.1	X^2 =0.62
Total	23	16.2	119	83.8	142	100	

As indicated in the table above, among 112 urban residents, 18(16.1%) were positive for malaria infection and among 30 residents, 5(16.7%) were positive for malaria infection. The distribution of malaria among the residence of patients was not significantly associated with malaria infection (p-value>0.05).

Table 4: Distribution of Malaria in relation to Occupational status among patients requested for blood film examination in Shanan gibe Hospital, Jimma town South West Ethiopia, from February 10 to 25,2013

Occupational Status	Positive		Negative		Total	
	No	%	No	%	No	%
Governmental Employee	3	2.1	2	1.4	5	3.5
Student	7	4.9	36	25.4	43	30.3
Farmer	1	0.7	3	2.1	4	2.8
House Wife	7	4.9	37	26.1	44	31.0
Merchant	1	0.7	5	3.5	6	4.2
Other**	4	2.8	36	25.4	40	28.2
Total	23	16.2	119	83.8	142	100

** includes daily laborer, NGO employer, under five children and joblesses

Table 5: Distribution of Malaria in relation to educational status among patients requested for blood film examination in Shanan gibe Hospital, Jimma town South West Ethiopia, from February 10 to 25,2013

Educational status	Positive		Negative		Total	
	No	%	No	%	No	%
No Formal education	2	1.4	18	12.7	20	14.1
Pre-school children	4	2.8	29	20.4	33	23.2
Elementary School	11	7.7	41	28.9	52	36.6
High School and above	6	4.2	31	21.8	37	37.1
Total	23	16.2	119	83.8	142	100

As indicated in the above table, out of 142 patients requested for blood film examination, 20(14.1%) did not attend any formal education from which only 2(10%) were positive for malaria infection. 33 were pre-school children from which 4(12.1%) were positive for malaria infection; 52(36.6%) were attending elementary education from which 11(21.2%) were positive. for malaria infection and 37(26.1%) patients attended high school and above educational level from which 6(16.2%) were positive for malaria infection.

Table 6: : Distribution of Malaria in relation to presence of stagnant water among patients requested for blood film examination in Shanan gibe Hospital, Jimma town South West Ethiopia, from February 10 to 25,2013

	Malaria						P-value&x^2
Presence of Stagnant water	Positive		Negative		Total		P-value=0.0006
	No	%	No	%	No	%	
Yes	10	7.0	13	9.2	23	16.2	X^2 = 15.0
No	13	9.2	106	74.6	119	83.8	
Total	23	16.2	119	83.8	142	100	

As it is observed from table 5, from 23 patients who live in thearea with stagnant water, 10(43.5%) were positive for malaria infection and among 119 patients who were in the area wit no stagnant water, only 13(10.9%) were positive for malaria infection. The presence stagnant water was very statistically associated with malaria infection (p-value<0.05).

Table 7: Distribution of Malaria in relation to utilization of spray water among patients requested for blood film examination in Shanan gibe Hospital, Jimma town South West Ethiopia, from February 10 to 25, 2013

	Malaria						
Utilization of spray	Positive		negative		Total		p-value&x^2
	No	%	No	%	No	%	p-value = 0.570
Yes	18	12.7	99	69.7	117	82.4	
No	5	3.5	20	14.1	25	17.6	x^2= 0.323
Total	23	16.2	119	83.8	142	100	

From a total 142 patients, 117(82.4%) were in the area in which there is the use of spray from which 18(12.7%) were positive for malaria infection and from 25(17.6 %) who were not in the area in which there is the use of spray only 5(3.5%) were positive for malaria infection. There was no statistically significant association between the habit of using bed net and malaria infection (p-Value>0.05)

Table 8: Distribution of Malaria in relation to usage of ITBN among patients requested for blood film examination in Shanan gibe Hospital, Jimma town South West Ethiopia, from February 10 to 25,2013

	Malaria						p-Value & x^2
Usage of ITBN	Positive		Negative		Total		
	No	%	No	%	No	%	p-Value=0.006
Yes	7	30.4	73	61.3	80	56.3	
No	16	69..6	46	38.7	62	43.7	x^2= 49
Total	23	16.2	119	83.8	142	100	

From a total 142 patients, 80(56.3%) uses bed net, from which 7(30.4%) were positive for malaria infection and from 62 (43.7%) who don't use bed net 16(69.6%) were positive for malaria infection. There was statistically significant association between the habit of using bed net and malaria infection (p-Value<0.05).

CHAPTER SIX

DISCUSSION

The overall prevalence of malaria obtained in this study was 23(16.2%). Out of the 142 total study subjects 67 (47.2%) and 75(52.8%) were male and female respectively. Among total of 23 positives, 11(47.8%) were male and 12(52.2%) were female. The number of female in the study exceeded that of male and this may be due to the pregnancy status.

The age of study population ranges from 0.5 to 65 years, with the peak number between 0-4, and the peak positivity between 25-29 which was 5(21.7%) followed by the range of age 15-19 which was 2(6.7%). This study showed that the under five children and young people are at the high risk of malaria. This is due to that young people (25-29) were at the time of the pregnancy and the time time to build house and the under five children were also involved and this may be their low resistance to malaria infection.

Out of 142 patients included in the study, 20(14.1%) did not attend formal education and 122(85.9%) attended the formal education with the maximum number who attend elementary school which were 52(36.6%). This maximum positivity at elementary school was due to children are more exposable for malaria infection and also stay to study out of bed net during night.

Among population of the study subjects 112(78.9%) were the residents of Jimma town from which 18(16.1%) were positive for malaria infection and 30(21.1%) were out of Jimma town from which 5(16.7%) were positive for malaria infection. The study showed that the residents out of Jimma town were more slightly more infected by malaria infection. This may be due to lees awareness about malaria, usage of bed net, and more stagnant water than the town.

The prevalence obtained in the study was 23(16.2%), from which the most dominant species of p.vivax which was 18(78.3%) followed by p. falciparum which was 4(17.4%) and the mixed infection was only 1(4.3%). The prevalence obtained in this study was higher than the expected prevalence; this variation may be due to that the the expected prevalence was for the whole population of the residence,while this study was conducted on subjects which were suspected clinically for malaria infection and requested for blood film examination.

The dominant species in the study was p.vivax(78.3%) followed p.falciparum(17.4%) which is different from the study conducted in Northern Ethiopia(Gonder). This variation may be due to the difference in geographical location of the two areas. It may be also due to the study was conducted in dry seasons and the cases may be due the relapse of malaria which is the characteristics of p.vivax.

CHAPTER SEVEN

CONCLUSION AND RECOMMENDATION

CONCLUSION

- The overall prevalence of malaria infection obtained in this study was 16.2% and it is significantly associated with the presence of stagnant water in the community area.
- P. vivax was the most dominant (78.3%), followed by p.falciparum which was (17.4%) and mixed infection (4.3%).
- The prevalence was high in females than males.
- The majority of patients are within the age 15 to 19.

RECOMMENDATION

Based on the findings and observations in this study, the following recommendation was rised:

- Health education on the etiology, source of infection, ways of transmission of the parasite, prevention and control methods should be provided for the community.
- Environmental modification and improvement of sanitation by eliminating the breeding sites of mosquitoes and by avoiding stagnant water in the community areas.
- It is better if the interested and concerned body conduct further study there with highly sensitive and specific techniques

REFERENCES

1. Cheesbrough Monica,DistrictLaboratory Practice in Tropical Countries, Part I,2nd edition.Cambrage University press.2005;239-285.

2. Judith H. Essentials of Human Parasitology, Argosy Company part I,2002:pp 118

3. http://www.bettermedicine.com/article-1/treatments

4. Malaria Consortium diseases control, better health December18,2012.Also available at: http://www.malariaconsortium.org/pages/about-malaria.htm

5. • ^ Abba K, Deeks JJ, Olliaro P, Naing CM, Jackson SM, Takwoingi Y, Donegan S, Garner P (2011). "Rapid diagnostic tests for diagnosing uncomplicated *P. falciparum* malaria in endemic countries". *Cochrane Database of Systematic Reviews (Online)* (7): CD008122. doi:10.1002/14651858.CD008122.pub2. PMID 21735422.

6. MOH. Malaria and Other vector borne diseases Prevention and Control team. National five year Strategic plan of Malaria control in Ethiopia, Addis Ababa:MOH, 2001

7. Tulu AN. Malaria. In Kloos H and Zein ZA (editors).
The ecology of health and diseases in Ethiopia. Oxford: West view press, 1993

8. Wagari D, Ahmed and Fikere E. Knowledge attitude and practice about Malaria the mosquito and anti-malaria drugs in rural community. Ethiopian Journal Health development.17 (2):99-104

9. Economic section, United States Embassy in Nigeriaplot1017, Diplomatic Drive central area Abuja, FCT, Nigeria December 2011. Also available at: http://photos.state.gov/libraries/nigeria/487468/pdfs/December%20Malaria%20Fact%20Sheet%202.pdf

10. Haque U. Ahmed S. Hossain S. et al. Malaria prevalence endemic districts of BangladeshJournal. 2009:4(8); 1371 also available at: www.plosone.org/article/info%3Adoi%2f10.137%2Fjournal.pone.0006737

11. Kumar A, Valech N, Jain T and Dash AP.Burden of Malaria in India: Retrospective and Prospectiveview, American Journal of tropical Medicine and Hygine, Vol 77, 2007. Pp 69-70

12. Alain Nahum, Annette Erhart, Ambroisine Mayé, Daniel Ahounou, Chantal van Overmeir, Joris Menten, Harry van Leon, Martin Akogbeto, Marc Coosemans, Achille Massougbodji, Umberto D'Alessandro. Malaria incidence and prevalence among children living in a peri-urban area on a coast of Bennin, West Africa.
AMJ.Trop.Med.H79, 2010, 83(3):405-4473. Also available at: www.ncbi.nlm.nih.gov/pmc/2929036

13. Sidding Metal, Screening blood donors for Malaria Parasites
In Sudan 2004.Vol 14(2), p 67-70

14.Eisele T.MillerJ. And Mooga H. Hamainza B. Keating J. Malaria infection and Anemia prevalence in Zambia Laugwa district: and area of near-universal insecticide-treated mosquito net coverage.AMJ.trop.Hyg.2011; 84(1); 152-157. Also available at: www.ncbi.nlm.nih.gov/pmc/articles/PMC3005497/

15. Sintasath D.Ghebremeskel T.Lynch. M. Malaria prevalence and associated risk factors in Eritrea .AMJ.Trop.med.779, 2005, 72(6):682-87. Also available at: www.ncbi.nlm.nih.gov/pubmed/18803880

16. Malaria operational plan (MOP) Ethiopia FY 2010, December. Also available at:www.pmi.gov/countries/mopsfy10/Ethiopia.mop.fy10

17. Shargie E. Gebre T. Ngondi J. Mosher A. Malaria prevalence and mosquito net coverage in Oromia and SNNPR regions of Ethiopia. Biomed centerPublic Health 2008; 8:32.
Also available at: www.biomedcentral.com/1471.2458/8/321

18. Alemu A. Tsegaye W.GolossaL.abebe G.urban malaria and associated risk factors in Jimma Town, South west Ethiopia.
Also available at: www.ncbi.nlm.gov/pubmed/21699741

ANNEX I

LABORATORY PROCEDURE

1. The tip of the finger or the ear lobe was cleaned by using a swab moistened with 70% alcohol. The area was allowed to dry.
2. The finger was prick using sterile Lancet.
3. Small drop of blood was added on a clean microscope slide
4. The thin film was immediately spread using smooth edged slide spreader. Blood from anemic patient needs quick spreading with the increased angle of the spreader.
5. The large drop of blood also was dropped to make a thick blood film with approximately 1cm diameter.
6. Allow the blood to air dry with the slide in horizontal position.
7. Using a lead pencil label the slide with date, patient name and number.
8. Fix the thin blood film with absolute methanol or ethanol (Without touching the thick blood film if both are on the same slide).Allow thin blood film for 1-2 minutes.
9. Then stain both blood films as follows:
    - Gently pour 3% or 10% Giemsa working solution into staining Jar.
    - Put the slide VIN a rack inside the staining jar. The slide should be fully covered with the stain.
    - Stain for 30-40 minutes for 3% and 10-15 minutes for 10% Giemsa working solution.
    - Wash the stain using clean water.
    - Wipe the back of each slide with paper towels.
    - Dry the slide in a vertical position.
10. Examination with oil immersion.
11. Record the result in a prepared format.

REAGENT AND MATERIAL

REAGENT

- Giemsa stain
- Absolute methanol
- Oil emersion
- 70%alchol

MATERIAL

- Microscope
- Washing Jar and Washer
- Cotton
- Drying
- Disposable basket
- Glove
- Syringe
- Microscope Slide and Spreader
- Lancet

REPORTING SYSYEM

After a systematic examination of 100 fields using oil immersion objective the result will be reported by specifying their stage with density and before report it will be interpreted as follows:

- 1 - 10/100 HP……..+1
- 11- 100/100 HPF……...+2
- 1 – 10/HPF……+3
- >10/HPF……+4

ANNEX II

QUESTIONNAIRE

JIMMA UNIVERSITY

DEPARTMENT OF MEDICAL LABORATORY SCIENCE AND PATHOLOGY QUESTIONNAIRE FOR PARASITOLOGICAL STUDY OF MALARIA PREVALENCE IN SHANAN GIBE HOSPITAL.

CHOOSE THE BEST RESPONSE BY MAKING(X) OR WRITE AN APPROPRIATE RESPONSE IN THE SPACE PROVIDED (FOR THE INTERVIEWER).

Date_____

I. Identification

1. Code _____ 3. Age_____

2. Sex: Male ☐ Female ☐ 4. Residence: ☐ Urban ☐ Rural ☐

II. Occupational status

A .Governmental Employees B. Student
C. Farmer D. Merchant
E. House Wife . F. others

III. Educational Status

A. Illiterate
B.Literate: B1.Pre-school children B2.Elementary school
B3. High school and above

Yes ☐ No ☐

V. Is there any stagnant water around your home**?**

Yes ☐ No ☐

VI. Is there any utilization of Spray?

Yes ☐ No. ☐

VII. Result_____

Date & Sign_____