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Magnitude of Malaria Infection in Ethiopia

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Abstract- *Background:* Malaria is a major public health problem in worldwide and causes high morbidity and mortality. Studying its prevalence is necessary to implement effective control measures. Therefore, the aim of this study was to determine the prevalence of malaria in Arba Minch hospital, Ethiopia.

Method: A cross sectional study was conducted from January to April, 2010. A well designed and structured questionnaire and Laboratory investigation were used to collect data. Data was processed and analyzed with SPSS version16.0.

Results: A total of 400 patients clinically suspected to have malaria were examined with overall prevalence of malaria was 7% (28 malaria cases out of 400 patients) of which 18 (64.3%) were positive for Plasmodium falciparum and 7 (25%) for Plasmodium vivax; the remaining 3 (10.7%) showed mixed infections of Plasmodium falciparum and Plasmodium vivax. Males 16 (4%) were more infected than females 12 (3%). Gender had statistically significant association with malaria infection ($p<0.005$). All age groups were infected but high prevalence observed in age groups 15–19, followed by 20–29 years old.

Conclusion: This study showed that high prevalence of malaria was observed. Therefore health professionals and administra- tors have to focus on giving health education on prevention and control of malaria.

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I. Introduction

Malaria is a life-threatening infectious disease caused by the protozoan parasite called Plasmodium. The World Health Organization (WHO) estimated 660,000 deaths in 2011 directly attributed to malaria, approximately half of the world's population being at risk of infection [1]. Four main species of malaria infect humans: *Plasmodium falciparum* (P. falciparum), *Plamodium vivax, Plasmodium malariae* and *Plasmodium ovale*. *Plasmodium falciparum* is the most highly virulent species and is responsible for almost all of the 1.7–2.5 million deaths worldwide caused by malaria [2,3]. It is a leading public health problem in Ethiopia where an estimated 68% of the population lives in malarious areas and three-quarters of the total land mass is regarded as malarious [4] This makes malaria the number one health problem in Ethiopia with an average of 5 million cases per year [5]. The disease causes 70,000 deaths each year and accounts for 17% of outpatient visits to health institutions [6]. The aim of this study is to asses prevalence of malaria in Arba Minch hospital.

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II. Methods and Materials

During the period January to April 2010 a total of 400 patients with typical symptoms of the disease, such fever (>37.8°C), headache and back and joint pain consistent with malaria was included in this study.

a) Sample collection

Two milliliters of venous blood samples were collected into an Ethylene diamine tetra acetic acid (EDTA) containing bottles for the study, using vein puncture technique [7].

b) Blood examination

Laboratory analysis was carried out after thin and thick blood films prepared according to technique out lined by Cheesbrough [7] and examined microscopically for malaria parasites under the microscope.

III. Result

A total of 400 patients clinically suspected to have malaria in Arba Minch Hospital were participated, of these, 238 (59.5%) were males and 162 (40.5%) were females (Table1).

Table 1 : Socio-demographic characteristics of study participants (n=400)

Variables	Frequency (percent)
Gender	
Male	238 (59.5)
Female	162 (40.5)
Age	
15-19	30 (7.5)
20-29	190(47.5)
30-39	110 (27.5)
40-49	50(12.5)
50-60	20(5)

The overall prevalence of malaria was 7% (28 malaria cases out of 400 patients) of which 18 (64.3%) were positive for *Plasmodium falciparum* and 7 (25%) for *Plasmodium vivax*; the remaining 3 (10.7%) showed mixed infections of *Plasmodium falciparum* and *Plasmodium vivax* (Table 2).

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Table 2 : Prevalence of malaria parasite among study participants

Malaria parasite	Frequency	Percent (%)
Plasmodium falciparum	18	64.3
Plasmodium vivax	7	25
Mixed infections (*Plasmodium falciparum* and *Plasmodium vivax)*	3	10.7

Males 16 (4%) were more infected than females 12 (3%). Gender had statistically significant association with malaria infection ($p<0.005$) [Table 3].

Table 3 : Prevalence of malaria parasite in relation to sex (Gender) among study participants

Sex	Number of examined	Number infected	Percentage	P-value
Male	238	16	4	0.001
Female	162	12	3	
Total	400	28	7	

In this study all age groups were infected but high prevalence observed in age groups 15–19, followed by 20–29 years old (Table 4).

Table 4 : Prevalence of malaria parasite in relation to age groups among study participants

Age	Number of examined	Number infected	Percent (%) infected
15-19	30	12	3
20-29	190	8	2
30-39	110	4	1
40-49	50	3	0.75
50-60	20	1	0.25
Total	400	28	7

IV. Discussion

Malaria is a major public health problem in Ethiopia. Over the past years, the disease has been consistently reported as the first leading cause of outpatient visits, hospitalization, and death in health facilities across the country [8]. In this study the overall prevalence rate of malaria was 28 (7%). This result was lower than similar studies done in Ethiopia [9, 10, 11] but higher than study conducted in other area [12]. This difference might be due to altitude variation and climatological differences that may contribute to a great role for breeding of Anopheles vector. The predominant Plasmodium species detected was *Plasmodium falciparum*, followed by *Plasmodium vivax*. This was in agreement with other previous studies [13-17]. But other a studies reported that the most prevalent species was *Plasmodium vivax*, followed by *Plasmodium falciparum* [18, 19].

Males were more infected than females, which was statistically significant ($p<0.005$). This is in line with the other previous studies [9, 20, 21]. The higher prevalence rate might be due to the fact that males engage in activities which make them more prone to infective mosquito bites as compared to females' counterparts which are mostly at home and protected from such infective bites.

In all age groups, malaria was reported in the study area. However, significantly affected age groups were 15–19 years old, followed by 20–29 years old. This might be associated with their daily activities. Farming is extensive in Arba Minch. Because of high temperature in this area, daily activities are accomplished especially during night. This may expose them to the bite of mosquitoes.

The occurrence of malaria depends on adequate rainfall and temperature. In areas with a temperate climate, transmission of malaria is commonly limited to months in which the average temperature is above the minimum required for sporogony[22].

V. Conclusion

This study showed that there is high prevalence of malaria. Malaria has statistically significant association with sex and age. Therefore, health planners and administrators need to give intensive health education for the community on prevention and control of malaria.

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VII. Competing Interest

The author declared that there is no any relevant competing interest to disclose in this research.

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