



# PREVALENCE OF MALARIA PARASITES AMONG PATIENTS ATTENDING A HOSPITAL IN MANGU LOCAL GOVERNMENT AREA, PLATEAU STATE, NIGERIA

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## ABSTRACT

Malaria parasite is regarded as one of the most serious global health problems. Its large population, diverse weather conditions and cultures make it difficult to implement the same control measures in Nigeria. The current study was conducted from June to October, 2016 to determine some malariometric parameters such as malaria prevalence, transmission based on age and the gender among patients attending a Primary Health Center in Mangu, during the malaria transmission season. Out of the 200 (100%) samples collected and examined, an overall prevalence of 51(25.5%) was recorded. The highest prevalence rates was recorded among age group 1-10 years with 8(33.3%) followed by 61–70 years with 3(30.0%) while least prevalence was recorded among 11 – 20 years age group with 7(23.3%). Statistically, there is no significant difference on malaria based on age ( $P>0.05$ ). The result also revealed that Males recorded the highest prevalence rate of 21(30.0%) while the Females had the least prevalence of 30 (23.07%). Subjects with primary education training had the highest prevalence rates of 9(50.0%) while the least prevalence was recorded among those with secondary education 8(15.4%). A statistical significant difference of malaria infection in relation to educational status ( $P<0.05$ ) was observed. The results are important for an effective malaria control programme in Nigeria.

**Keywords:** *Malaria, Mangu, Plasmodiumfalciparum, Prevalence*

## INTRODUCTION

The World Health Organization (2002) described malaria as a widely distributed tropical disease caused by a protozoan parasite of the genus *Plasmodium*. The disease is transmitted by the pathogenic bite of an infected female *Anopheles* mosquito (Alioune *et al.*, 2010).

There are five species of *Plasmodium* protozoans known to elicit human malaria, they are: *Plasmodium falciparum*, *P. vivax*, *P. ovale*, *P. malariae* and *P. knowlesi* (Caraballo, 2014). Out of these, the most severe form of human malaria is caused by *P. falciparum* while the others generally cause a milder form of malaria (Caraballo, 2014; WHO, 2014). In Africa, *P. falciparum* is the major cause of the most severe form of malaria which accounts for over 60% of outpatient visits and 30% of hospital admissions in Nigeria (Federal Ministry of Health, 2010).

Malaria remains a worldwide health concern, instigating 216 million infections and approximately 655,000 deaths in the year 2010 (WHO, 2011). The disease is prevalent in parts of Africa, Oceania, Asia, Central and South America, with approximately 90% of the global malaria burden borne by Sub-Saharan Africa (Oshikoya, 2006; WHO, 2012). The World Malaria Report indicated that Nigeria accounts for a quarter of all malaria cases in the 45 malaria endemic countries in Africa, showing clearly the challenge of malaria in Nigeria (WHO, 2008).

In Plateau State, malaria causes outpatient, inpatient and admission of children and women at health facilities (WHO, 2002). The high burden of malaria in Plateau state is due to the fact that new malaria cases are reported yearly. The annual incidence rate is 400-500/1000 people and this number double for children less than five years of age (Gahutu *et al.*, 2011). The present work is therefore designed to determine the prevalence of malaria parasites among patients attending Cocin Hospital and Rehabilitation Center Mangu, Mangu Local Government Area, Plateau State, Nigeria.

## MATERIALS AND METHOD

The study was conducted in Mangu Local Government Area (LGA) a semi-urban area of Plateau state, Nigeria. Located at 9°31' N / 9° 34' E. It has an area of 1653 km<sup>2</sup> and a population of 296,931 at the 2006 census. The climate is tropical, sub-humid with mean daily temperature of 1000m. The rainy season is between April and October, while the dry season last for November to March.

Ethical clearance to conduct the study was granted by the COCIN Hospital and Rehabilitation Center Mangu. Permission to conduct the research

was sought and granted by the Hospital Ethical Management Committee. A written consent to participate was sought for each responded before questionnaire was administered.

Data was collected using a structured and pre-tested questionnaire to collect information on socio-demographic factors, knowledge about the transmission and prevention of malaria, utilization and coverage of Insecticide Treated Nets (ITNs) and Indoor Residual Spraying (IRS) were administered to the participants (Oshikoya, 2006).

Blood samples were collected from patients attending the hospital, who were febrile or with a history of fever in the past 24 hours and were screened for malaria parasite. Finger prick blood samples were collected to prepare thick and thin films stained with Giemsa stain and used for microscopic identification and parasite density determination (Cheesebrough, 2000). The study subjects consisted of 200 subjects aged between 1-70 years.

## RESULTS AND DISCUSSION

### Age Related Prevalence of Malaria Infection

The results presented in Table 1 shows the prevalence of malaria infection in relation to age groups. Out of the 200 (100%) samples collected and examined, an overall prevalence of 51(25.5%) was recorded. Mangu Local Government is an area located in the central plateau state by a vast expanse of marsh land used for rice, potato cultivation and irrigation, which is the source of food and income. It's a plausible that the marshland support mosquitoes breeding and increase malaria transmission (Port *et al.*, 1980).

The highest prevalence rates was recorded among age group 1-10 years with 8(33.3%) followed by 61-70 years with 3(30.0%) while least prevalence was recorded among 11-20 years age group with 7(23.3%). There was no significant difference on malaria based on age ( $P > 0.05$ ). The higher rates of infection observed among age groups 1-10 (33.3%) and 61-70(33.0%) could be due to age related weak immune system which could help susceptibility of erythrocytes to infection and due to ignorance and lack of malaria preventive measures (Lengele *et al.*, 2004).

Human activity and mosquito-biting habits may also play a part in differential mosquito-human exposure pattern. Behavioral patterns including older children working and playing where the *Anopheles* vectors are present, especially at dusk when the *Anopheles* become active (Smith *et al.*, 1999). Apart from young children being more likely to sleep under bed nets compared to older Siblings (Smith *et al.*, 2001), older children as observed in this study stay out longer in the evening and more likely to be biting by malaria-carrying

mosquitoes outdoors before returning later to their houses.

This finding is however consistent with reports Alioune *et al.*, (2010) who observed 44.3% among age group 1-13 and 60-70 years in Dielmo and Ndiop villages in Senegal. This is in contrast to the report of Vyas and Kumaranayake (2006) who reported significantly low risk of parasitaemia in aged  $\geq 10-60$ .

Table 1: Age Related Prevalence of Malaria Infection

Age Group	No. Examined	No. Positive (%)
1-10	24	8(33.3)
11-20	30	7(23.3)
21-30	60	15(25.0)
31-40	35	10(28.6)
41-50	29	7(24.1)
51-60	12	3(25.8)
61-70	10	3(30.0)
<b>Total</b>	<b>200</b>	<b>51(25.5)</b>

$\chi^2_{cal}=1.3648$ ,  $\chi^2_{tab}=12.59$ ,  $df = 6$

**Gender Related Prevalence of Malaria Infection**

Results presented in Table 2 showed the prevalence of malaria infection in relation to gender. Male had the highest prevalence rate of 21(30.0%) while the Female had the least with 30(23.1%). Statistically, there is no significant difference at  $P>0.05$ . The lack of significant variation observed in the prevalence of malaria infection in relation to gender could be the result of similar exposure to malaria parasite, due to environmental and living conditions which support vectors (Karam *et al.*, 1995). This result does not agree with that of Obamikande and Simon-Oke (2017) who observed a significant difference ( $P=0.001$ ) in prevalence of malaria infection in relation to gender in Akure, Ondo State, Nigeria.

Table 2: Gender Related Prevalence of Malaria Infection

Gender	No. Examined	No. Positive (%)
Male	70	21(30.0)
Female	130	30(23.1)
Total	200	51(25.5)

$\chi^2_{cal}=1.148$ ,  $\chi^2_{tab}=3.84$ ,  $df = 1$

**Prevalence of Malaria Infection Related to Educational Status**

The results in Table 3 show the prevalence of malaria infection in relation to educational status. Patients with primary education had the highest prevalence rates of 9(50%) of malaria infection while the least was recorded among those with secondary education 8(15.38%). Statistically, there is a significant difference of malaria infection in relation to

educational status ( $P<0.05$ ). The significant difference and higher prevalence of malaria parasites in patients with primary education could be due to the lack of knowledge on the causative agents and preventive measures (Bousema *et al.*, 2012). This result does not agree with that of Ocheje and Dogara (2016) who observed a significant difference ( $P>0.05$ ) in the prevalence of malaria parasite infection in Jigawa State, Nigeria.

Table 3: Prevalence of Malaria Infection Related to Educational Status

Parameters	No. Examined	No. Positive (%)
No formal education	110	44(40.0%)
Primary education	18	9(50.0%)
Secondary education	52	8(15.4%)
Tertiary education	20	4(20.0%)
Total	200	65(32.5%)

$\chi^2_{cal}=9.2431$ ,  $\chi^2_{tab}=7.81$ ,  $df = 3$

**Prevalence of Malaria Infection Related to Occupational Status**

The results in Table 4 show the prevalence of malaria infection in relation to the occupational status. The highest prevalence rates was observed among farmers with 33(45.2%) followed by artisans with 5(41.7%) while the least infection rate was recorded among Traders with infection rate of 5(20.0). Statistically, there is no significant difference of malaria infection to occupational status at  $P>0.05$ . This result agrees with that of Kalu *et al.*, (2012) who equally observed a high prevalence in farmers in Uturu Communities of Abia State, Nigeria.

Table 4: Prevalence of Malaria Infection Related to Occupational Status

Parameters	No. Examined	No. Positive (%)
Farmers	73	33(45.2)
Traders	25	5(20.0)
Civil servants	30	8(26.7)
Students	60	20(33.3)
Artisans	12	5(41.7)
Total	200	71 (35.5)

$\chi^2_{cal}=4.4963$ ,  $\chi^2_{tab}=9.49$ ,  $df = 4$

**CONCLUSION**

The 25.5% prevalence of malaria parasite observed in this study revealed that malaria was still endemic in the study area. It was observed that malaria parasite was most prevalent in patients between age groups 1-10, but the difference between the age groups was not significant ( $P>0.05$ ). Males had a higher prevalence of malaria infection than females, but the

difference was not significant ( $P>0.05$ ). The study however revealed that prevalence of malaria in the study site was dependent on educational status. It was however not dependent on occupational status.

The prevalence of malaria is now becoming pandemic in our world most especially developing

countries such as Nigeria. The issue of malaria has now become a major challenge for medical practitioners in the world at large and this is becoming a public health concern. It is therefore recommended/required that more awareness to educate people especially the rural communities should be intensified.

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