Sahel Journal of Life Sciences FUDMA (SAJOLS)
June 2024 Vol. 2(2):129-132
ISSN: 3027-0456 (Print)
ISSN: 1595-5915(Online)
DOI: *https://doi.org/10.33003/sajols-2024-0202-17*

Research Article

Prevalence of Malaria among Patients attending Federal Medical Centre, Owerri, Imo State, Nigeria

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ABSTRACT

The malaria parasite is a parasitic protozoan (a group of single-celled microorganisms) that inflicts humans with malaria. It is responsible for a significant proportion of the health burden of developing countries. Thus, this study aimed to evaluate the prevalence of malaria among patients attending the Federal Medical Centre Owerri, Imo State, Nigeria. A total of 150 patients consented to participate. Malaria diagnosis was performed using rapid diagnostic test kits and microscopic examination of Giemsa-stained blood film. Questionnaires were administered to gather socio-demographic data. The analysis revealed a 53% prevalence of malaria. Statistical analysis indicated associations between malaria occurrence and gender, educational level, and economic status. This study highlights the high prevalence of malaria among patients at FMC Owerri.

Keywords: Prevalence, Malaria, Owerri, Imo State, Parasite

Citation: Mohammed, A. and Oda, O. (2024). Prevalence of Malaria among Patients attending Federal Medical Centre, Owerri, Imo State, Nigeria. *Sahel Journal of Life Sciences FUDMA*, 2(2): 129-132. DOI: *https://doi.org/10.33003/sajols-2024-0202-17*

INTRODUCTION

Malaria is caused by the parasitic protozoan transmitted by the female anopheles mosquito. The parasite inflicts humans and adversely impacts their well-being. Its manifestation in humans is characterized by symptoms such as vomiting, tiredness, fever, headaches, and even death in extreme cases (Yotoko, 2016). Upon biting a human, the parasite is introduced into the victim's blood, from where it relocates to the human liver where it incubates, reaches maturity and commences reproduction. Among the five known species of plasmodium, *P. falciparum* has been blamed more for the high mortality rates that characterises malaria parasite infection (Yotoko, 2016).

The significance of malaria as a global public health threat cannot be over-emphasized. In recent times, malaria cases numbering around 244 million have been established worldwide (WHO, 2022) and an estimated 80% of deaths associated with the said infection domiciled within Africa (WHO, 2023). Although an estimated 58% of malaria infection prevalence has been reported for Nigeria, this may vary from one region to another owing to variations in socio-demographic characteristics of the populations, environmental as well as climatic factors (Yohanna *et al*., 2019; Ngum *et al*., 2023).

Efforts by critical stakeholders in the fight against malaria appear futile partly because information on malaria prevalence at regional levels in affected countries is scanty. Therefore, intervention approaches geared towards the effective elimination of malaria from the globe must give a pride of place to data on the regional prevalence of the aforementioned infection as this would enhance effective monitoring and implementation of control strategies (WHO, 2023).

MATERIALS AND METHODS

Study Area

This study was conducted at the Federal Medical Centre (FMC) Owerri, located in Imo State, Southeastern Nigeria. The state, predominantly inhabited by Igbos, has a population of about 3.9 million (Census 2006). Owerri, the capital of Imo State, is situated between latitudes 29 and 30^0E.

Study Population

This study included male and female patients attending FMC Owerri during the study period.

Ethical Clearance

The Institutional Ethics Committee of FMC Owerri Imo State approved this research protocol titled "Prevalence of Malaria Parasites among patients attending Federal Medical Centre Owerri, Imo State, Nigeria". This approval was documented in their letter with reference number FMC/OW/Vol.1, dated August 23, 2021.

Inclusion Criteria

Patients attending FMC Owerri who consented to participate in the study were included.

Determination of Sample Size

The sample size was determined using the method of Naing *et al*. (2006) was employed to determine the size of the sample used in this study.

$$N = \frac{Z^2 p(1-p)}{d^2}$$

Using a previous prevalence by Eke *et al*. (2022)

Sample and Sampling Technique

A total of 150 blood samples (2 ml each) were collected in sterile containers by trained personnel.

Test for Malaria Parasite

Malaria diagnosis was performed using rapid diagnostic test kit and examination of thick and thin Giemsa–stained films (Warhurst and Williams, 1996).

Data Collection Using Questionnaire

A structured questionnaire was used to collect socio-demographic characteristics and clinical presentation of the patients.

Data Analysis

Data collected analyzed using computer statistical package SPSS 23.0. Chi square test was used to determine associations between variables. Descriptive statistics was employed to analyze data on malaria prevalence in the study population which expressed in percentage. The confidence level for analysis was 95% and significance was held at 0.05 levels.

RESULTS

The prevalence of malaria in the study population is as presented in Figure 1. Out of the 150 samples, 80 were positive for malaria parasite resulting in a prevalence of 53.3%. The prevalence of malaria in relation to socio-demographic indices is presented in Table 2. Statistical analysis showed a significant association between malaria occurrence and gender, with females having a higher prevalence (58.7%) compared to males (44.8%). Age group 61-70 had the highest prevalence (75%) while age group 31-40 had the lowest percentage occurrence of (34.5%). Educational level also showed a significant association with primary school certificate holders having the highest prevalence (70.6%) and secondary school certificate holders the lowest (43.7%). There was no significant association between malaria occurrence and occupation or residential area. Economic status showed a significant association with low income earners having a higher prevalence (56%) compared to average income earners.

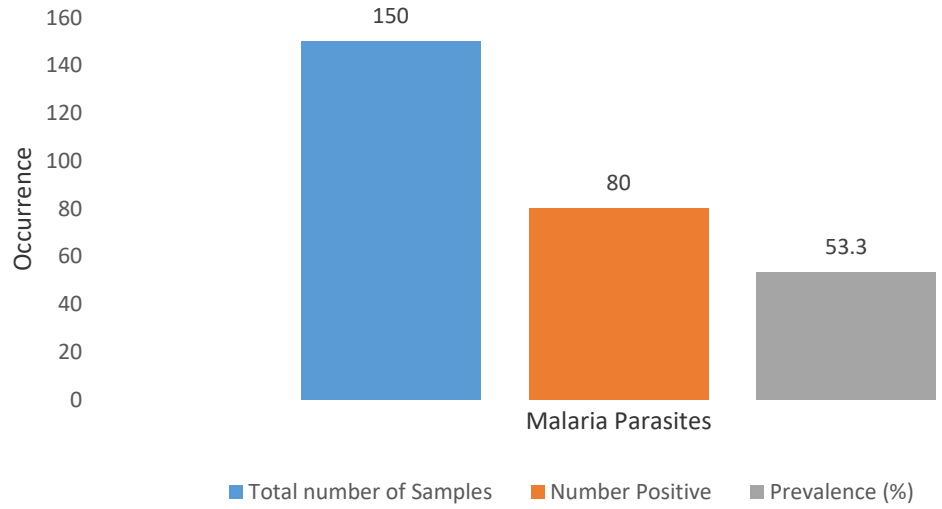

Fig. 1: Prevalence of Malaria Parasite in the Study Population

Table 1: Occurrence of Malaria in the Study Area according to Demographic Factors

Socio-demographic Factors	No Examined	No Positive	% Occurrence	χ^2	P-value
Gender					
Male	58	26	44.8	7.7066	0.05
Female	92	54	58.7		
Age					
0-10	30	20	66.7	30.2665	0.07
11-20	15	8	53.3		
21-30	26	13	50		
31-40	29	10	34.5		
41-50	20	9	45		
51-60	15	7	46.7		
61-70	8	6	75		
71-80	7	3	42.9		
Educational Level					
Primary certificate	34	24	70.6	18.1200	0.01
Secondary certificate	71	31	43.7		
Tertiary certificate	45	21	46.7		
Occupation					
Students	60	35	58.3	54.9332	0.20
Farmers	22	15	68.2		
Civil servant	8	6	75		
Unemployed	40	12	30		
Self employed	20	8	40		
Residential Area					
Rural area	130	66	50.8	2.4352	0.81
Urban area	20	10	50		
Economic Status					
High income earners	0	0	0	7.879	0.01
Average income earners	50	20	40		
Low income earners	100	56	56		

DISCUSSION

Malaria has continued to be a major public health threat in developing countries including Nigeria, imposing significant economic burdens. The high prevalence of 53.3% observed in this study may be attributed to certain environmental features that characterize the participants' residential areas. The high prevalence is consistent with the 60% outpatient visit rate due to malaria in Nigeria (Idoko *et al*., 2015; Anjorin *et al*., 2020). Factors contributing to this high prevalence include multidrug-resistant malaria parasites, insecticide-resistant malaria vectors, increasing human population migration, lack of sanitation systems and increasing rate of deforestation (Nodem *et al*., 2023). The prevalence observed in this study is lower than the 77.0% reported by Adamu *et al*. (2023) in Kano and 66% reported by Eke *et al*. (2022) in Kaduna. These differences may be due to geographical and seasonal variation in malaria transmission. However, the prevalence in this study is comparable to 50.0% reported by Nodem et al. (2023) in Ngaoundéré, Cameroon.

The higher prevalence of malaria among females (58.7%) compared to male (44.8%) contradicts some studies but aligns with others, suggesting variations in habitat, exposure to mosquito bites and immunity (Morde and Borke, 2023). Lack of significant association between malaria occurrence and age may be due to varying exposure rates among different age groups. Lower malaria prevalence among individuals with higher education levels supports the notion that education increases awareness and preventative measures against malaria (Haruna *et al*., 2020; Omoya, 2017). Absence of significant association between malaria occurrence and occupation or residential area may reflect the widespread coverage of malaria control programs in both urban and rural areas (Nodem *et al*., 2023).

Economic status significantly impacted malaria prevalence, with low income earners having higher prevalence. This may be due to better access to

malaria prevention programs and interventions among high income individuals.

CONCLUSION

The prevalence of malaria in patients among patients attending FMC Owerri, Imo State was found to be 53.3%. Malaria occurrence was significantly associated with gender, educational level, and economic status. It is recommended that government intensifies malaria control measures, especially in rural areas to reduce the high outpatient visits due to malaria.

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