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Original Article

Prevalence of Malaria in Pregnant Women Attending Antenatal Clinicat Federal Polytechnic Medical Center, Bida, Niger Sate

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ABSTRACT

Malaria remains one of the most persistent and debilitating infectious diseases in Africa, with an enormous public health and economic burden. The aim of this study was to determine the prevalence of malaria in pregnant women attending Federal Polytechnic Medical Center, Bida. The samples were collected from the study population from August to October 2025. Giemsa staining method was used. Maternal age, parity and gestation period were determine through questionnaire. The results of the study stand at 75.00% prevalence. Maternal age investigations revealed 26 years and above were more infected (80.00%) with malaria than 21- 25 years of age range of pregnant women (47.00%). Gestation period infection shows that there is no significant difference between the trimesters considered. The prevalence percentage are as follows; 1st trimesters (74.00%), 2nd trimesters (77.00%) and (68.00%). The parity results presented multigravidae with higher percentage prevalence of (83.00%) while primigravidae recorded (39.00%). Findings from this study indicate that malaria infection among pregnant women in Bida isver high and significantly influenced by maternal age, gestational period and parity, with parity showing the strongest statistical association. These results highlight the need for continued malaria prevention programs targeting pregnant women, particularly through the use of insecticide-treated nets (ITNs), intermittent preventive therapy (IPTp)and regular antenatal screening to reduce the burden of malaria in pregnancy.

Keywords: Prevalence, Malaria, Pregnant, Women and Polytechnic

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INTRODUCTION

Malaria remains one of the most persistent and life-threatening infectious diseases in sub-Saharan Africa, with an enormous public health and socio-economic burden. It is caused by *Plasmodium* parasites with following species responsible for human infection; *Plasmodium falciparum, Plasmodium vivax, Plasmodium ovale and Plasmodium malariae* in Africa and transmitted by infected female *Anopheles* mosquitoes. Despite global malaria reduction efforts, Nigeria continues to account for the highest malaria burden worldwide, with an estimated 27% of

global cases and 31% of global malaria deaths [1]. Pregnant women constitute a particularly vulnerable group due to pregnancy-induced immunological changes that increase susceptibility to malaria infection [2,3].

In malaria-endemic regions such as Nigeria, malaria during pregnancy has been consistently associated with adverse outcomes such as maternal anaemia, miscarriage, intrauterine growth restriction, low birth weight, stillbirth and increased maternal and neonatal mortality [4]. According to [5], malaria infection contributes significantly to poor maternal health indicators in Nigeria, undermining efforts toward achieving Sustainable Development Goal 3, which seeks to improve maternal and child health.

Several factors have been identified as determinants of malaria prevalence in pregnancy, including parity, maternal age, and gestational period. Studies show that primigravidae (women in their first pregnancy) are at higher risk of malaria infection compared to multigravidae, due to the absence of acquired pregnancy-specific immunity against *Plasmodium falciparum* [6]. In addition, younger maternal age is strongly associated with higher malaria prevalence because immunity builds with age and lack of concomitant immunity [7]. Gestational period also plays a role; many studies reported that malaria infection peaks during the second trimester, a period characterized by higher maternal susceptibility, before declining in the third trimester [8, 9].

The environmental factors such as warm climate, seasonal rainfall and poor drainage provide breeding conditions for the biological vector (female *Anopheles* mosquitoes). Furthermore, inadequate access to quality antenatal services, combined with socio-economic constraints, contributes to persistent malaria transmission [10]. Information on the prevalence of malaria with regard to maternal age, gestation period and parity of pregnant women in the study locality is scanty if not unavailable, therefore study on the incidence of parasite in pregnant women of the area is a gap bridging research to ascertain the infection status of the participant and recommend appropriately.

MATERIALS AND METHODS

Study Area

This study was carried out in Federal Polytechnic Medical Center, Bida. Bida is the headquarters of Bida Local Government Area, located in Niger State, Nigeria. The town lies approximately between latitude 9°05′N and longitude 6°01′E. It is the capital city of Nupe-kingdom and is well known for its cultural heritage and socio-economic activities, such as farming, trading, blacksmithing and craftsmanship [11]. The area has a tropical climatecharacterized by a rainy season (May–October) and a dry season (November–April). The average annual rainfall ranges between 1,200 mm to 1,500 mm, with temperatures fluctuating between 28°C to 34°C, which provide favorable conditions for mosquito breeding and malaria transmission[12]. Bida has several health facilities, including the Federal Medical Centre (FMC) Bida, General Hospital,Bida and numerous Primary Health Care Centers (PHCs) that render antenatal and malaria diagnostic services.

Sample Collection

Samples were collected from pregnant women that visited the clinic for antenatal from 4th of August to 17thOctober 2025. Cotton wool dipped in alcohol was used to disinfect the spot to be punched for blood collection; the upper arm was tied with tourniquet to make the vein more prominent. Using a sterile syringe and needle, blood samples were carefully collected from the vein and transferred into a container or EDTA (Ethylene diaminetetra acetic acid) bottle to prevent coagulation. Each sample was properly labeled with the respondent's identification number. The collected samples were then taken to the laboratory under safe and sterile conditions for analysis to determine the presence of *Plasmodium* species. All blood collection procedures were performed under strict aseptic techniques to ensure accuracy and safety.

Processing and Examination

Using a sterile pipette, a small quantity of blood was withdrawn from each sample, a drop of the sample from pipette was placed on a clean glass slide. Thin film was made by gently spreading the drop across the slide using another clean slide held at a 45° angle. The thin film was then allowed to air dry. After drying, the slide were fixed in 50% methanol for a few seconds and allowed to air dry again. Once completely dry, the slides were stained using absolute Giemsa stain and left for 15 minutes. After staining, the slides were gently washed with clean water to remove excess stain, taking note of not to wash off the smear. The back of the slides were wiped clean, and the slides were placed on a drying rack to air dry. After drying, a drop of oil immersion was placed on the stained area, and the slides were examined under a microscope using ×10 and ×100 objective lenses [13]

Data Analysis

Data obtained from both the laboratory examination and the administered questionnaires were entered and processed using the Statistical Package for Social Sciences (SPSS) version 25. Descriptive statistics such as frequencies, percentages and charts were used to analyzed data on demographic information and the prevalence of malaria based on parity, gestational period and age. Inferential statistics, specifically the Chi-square (χ^2) test, were used to determine the relationship between malaria prevalence and variables such as age, parity, and gestation period. Results were presented in table form and a p-value $\leq$ 0.05 was considered statistically significant. The analyzed data were interpreted in line with the study's objectives.

RESULTS

Table 1 shows that malaria infection was more prevalent among pregnant women that were aged 26 years and above (80.00%) compared to those within age range 21–25 years(47.00%). A p-value of 0.010 was observed which indicates a significant relationship between maternal age and malaria infection.

Table 2 Presents malaria prevalence with respect to gestation period. The women in their second trimester had higher prevalence of (77.00%), followed by those in the first trimester (74.00%) and the least recorded by those in the third trimester (68.00%). The p-value (0.935) shows no statistically significant association between gestation period and malaria infection.

Table 3 shows that malaria infection was higher significantly among multigravidae participant (83.00%) compared to primigravidae (39.00%). A p-value of 0.000 was observed, indicating a statistically significant relationship between parity and malaria prevalence

Table 1: Prevalence of Malaria in Pregnant Women in Relation to Maternal Age

Age (Years)	Number Examined	Number Positive	Percentage (%)	P-Value
21–25	15	7	47.00	
26 and above	85	68	80.00	0.010
Total	**100**	**75**	**75.00**	

Table 2: Prevalence of Malaria in Pregnant Women in Relation to Gestation Period

Gestation Period	Number Examined	Number Positive	Percentage (%)	P-Value
1st Trimester	31	23	74.00	
2nd Trimester	47	36	77.00	
3rd Trimester	22	16	68.00	0.935
Total	**100**	**75**	**75.00**	

Table 3: Incidence of Malaria in Relation to Parity

Parity	Number Examined	Number Positive	Percentage (%)	P-Value
Primigravidae	18	7	39.00	
Multigravidae	82	68	83.00	0.000
Total	**100**	**75**	**75.0**0	

DISCUSSION

The findings from this study revealed that malaria remains a significant health challenge among pregnant women attending Federal Polytechnic Medical Centre, Bida. The infection rate is considerably high and it may be due to period in which the study was carried out (August-October), rainy season which provide many breeding ground for parasite biological vector. The 75.00% is reasonably higher than the 26% recorded by [14]. The higher prevalence of malaria among women aged 26 years and above shows that age plays a vital role in infection risk. Older women may experience declining immunity due to physiological stress. This result agreed with **[15]** that recorded older pregnant women in endemic regions with higher malaria prevalence than their younger counterparts. The study also shows that malaria prevalence varies slightly with gestational period, with the second trimester recording the highest rate (77.00%). This may be linked to physiological and immunological changes that occur during mid-pregnancy [8,9]. According to Adebayo et al**[16],** pregnant women in the second trimester experience temporary immune suppression, increasing their susceptibility to malaria infection.

Parity had a strong influence on malaria prevalence, with multigravidae showing higher infection rates (83.00%) compared to primigravidae (39.00%). This suggests that repeated pregnancies may reduce the body's ability to resist *Plasmodium* infection and any other pathogenic infection. Similar result was reported by **[17]**, who observed that multigravidae are more likely to test positive for malaria due to cumulative exposure to malaria vectors. In contrarily, some researchers have also reported higher prevalence among primigravidae and attributed it to lack of concomitant immunity [6].

Overall, the findings from this study indicate that malaria infection among pregnant women in Bida is significantly influenced by **maternal age, gestational period** and **parity**, with parity showing the strongest statistical association. These results highlight the need for continued malaria prevention programs targeting pregnant women, particularly through the use of **insecticide-treated nets (ITNs), intermittent preventive therapy (IPTp)**and **regular antenatal screening** to reduce the burden of malaria in pregnancy.

DECLARATION

Authors Contribution

AYD conceptualized the study. AYD and IM designed the study. MT participated in bench work and data collection. AYD, and DN performed the data analysis; AYD, IM and MT interpreted the data. AYD and IM prepared the first draft of the manuscript, reviewed by MI, DN and MT. All authors contributed to the development of the

final manuscript and approved its submission.

Conflicts of Interest
None

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Ethical Approval and Informed Consent
Ethical approval for this study was obtained from the Medical Director of the Centre, on behalf of the management board of the Centre, Federal Polytechnic, Bida Niger Stat . All participants were duly informed of the objectives of the study and the protocol for sample collection. Participation was voluntary by all.

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