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Anemia and Plasmodiasis among pregnant women in Otto Ijanikin Primary Health Centre, Otto - Ijanikin, Lagos, Nigeria

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Abstract:
Background & Aim: Malaria is an important health and development challenge in African, where pregnant women and children under age are most at risk. In 2015, there were 214 million cases and 438 thousand deaths for malaria. Here, we describe the effect of malaria on the packed cell volume of pregnant and non-pregnant woman.
Methods: A total number of 300 samples were collected for malaria and packed cell volume. Hundred (100) were non pregnant. Two hundred (200) were pregnant women of which 120 were multigravida and 80 were primigravida. They were all diagnosed for malaria and packed cell volume using rapid diagnostic technique and hematocrit method.
Result: *Of the 120 pregnant women, 60 (75%) of primigravida were infected by malaria compared with 78 (65%) in multigravida. Out of 100 non-pregnant women 19 (19%) were positive for malaria while 81 (81%) were negative. A total of 60 (75%) of primigravida fell among anemic group while 40 (38%) of multigravida were similarly affected. There was significant difference between parity and packed cell volume.*
Conclusion: *This study has shown that malaria occur mostly in primigravida than in multigravida. It also established that malaria infection reduces packed cell volume drastically if not treated. It was observed that non-administration of drugs and inadequate knowledge and perception of malaria contributed to the infection. Public awareness is highly advocated for in this local government*
Keywords; Malaria, Primigravidae, Packed Cell Volume, RDT.

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I. INTRODUCTION

Malaria is a serious public health problem particularly in pregnant women in the tropics (Nwonwu *et al., 2009)*. Plasmodium falciparum is responsible for the majority of malaria infections that occur in pregnancy as compared to other species of the parasite (Omo-Aghoja *et al.,*2008) Its rate of infection in pregnancy is twice that in non-pregnant women due to physiological changes and suppressed immunity during pregnancy (Lindsay *et al.*, 2000). Malaria in endemic countries is often asymptomatic during pregnancy, but it has substantial consequences for both the mother and her unborn baby. During pregnancy, anaemia is an important consequence of malaria infection. The intensity of malaria varies according to the season. Every year, about 25% of maternal deaths in hyperendemic malaria regions are due to malaria infection in pregnancy (Schantz-Dunn *et al.* ,2009). In sub-Saharan African (SSA) countries, malaria infection in pregnancy is often asymptomatic, which is one of the main challenges in controlling malaria infection in pregnancy. Adverse consequences of malaria infection in pregnancy for both the mother and her unborn baby include fetal loss (Van Geertruyden., 2004), intrauterine growth retardation (Menendez C, 2000) preterm delivery, low birth weight, congenital malaria (Natama *et al.*,2017) perinatal mortality(Steketee RW,2001) and increased risks of maternal anaemia (Shulman CE, 2001) Several studies reported a high prevalence of asymptomatic malaria infection in pregnancy (ranging from 21 to 58.4%)(Berry *et al*, 2018) and this represents a major public health problem since pregnant women living in these communities are not aware they are asymptomatic carriers of malaria parasites. Anaemia is more frequent in pregnant women, and more pronounced in primigravidae than in multigravidae (Shulman *et al*.,1996). It is estimated that approximately 50% of pregnant women in malaria-endemic countries of Africa are anaemic (WHO,1992,2001). Several studies reported a high prevalence of asymptomatic malaria infection in pregnancy (ranging from 21 to 58.4%) (Berry *et al.*, 2018) and this represents a major public health problem since pregnant women living in these communities are not aware they are asymptomatic carriers of malaria parasites.
This study, aimed to estimate the prevalence of malaria parasites and anaemia among pregnant women in the community.

STUDY AREA
The study was conducted at the Ijanikin health center in Ojo Local Government Area, Lagos State, Nigeria.

Study Design
This study was a cross-sectional survey lasting for a period of six months between January to June, 2024. A total of 200 pregnant women attending antenatal clinic at Ijanikin Health Center and 100 non-pregnant women voluntarily participated in the study.

Sample collection and Examination
Blood specimens of 200 pregnant women and 100 non-pregnant women were collected.
A packed cell volume (PCV) of less than 33.0% was regarded as anaemia during pregnancy according to World Health Organisation.

Data Analysis
Descriptive statistics was used to calculate percentage (%) prevalence of malaria parasites and anaemia.

II. RESULTS

Out of 200 blood samples collected from the pregnant women, 138(69%) were positive for malaria parasite, 60(75%) were Primigravidae and 78(65%) were multigravidae. Out of 100 nonpregnant women, 19 (19%) were positive while 81(81%) were negative. Malaria prevalence among the pregnant women in relation to gravidity was statistically significant (P>0.05).

TABLE 1: The prevalence of malaria parasite in the pregnant women in relation to gravidity

Gravidity	Number examined	Number Positive	Percentage Prevalence
Primgravidae	80	60	75
Multigravidae	120	78	65
Total	200	138	69

In table 1 the primigravidae has higher percentage of 75% compared with 65% of multigravidae. This is an indication that malaria infection greatly affects first timer among pregnant women.

TABLE 2: Prevalence of Packed Cell Volume level according to gravidity

Gravidity	Total	**≤ 33**	**% Prevalence of ≤ 33**	**≤33**	**% Prevalence of ≤33**
Primgravidae	80	60	75	20	25
Multigravidae	120	40	33.3	80	66.6
Total	200	100		100	

Table 2 shows that 60(75%) of the 80 primigravidae were anaemic while 40(33.3%) out of 120 multigravidae were anaemic.

Table 3: Percentage of both malaria and packed cell volume according to gravidity

Gravidity	Positive number for malaria	≥33%	≤33%	%prevalence of <33%	%prevalence of <33
Primgravidae	60	60	-	100	-
Multigravidae	78	40	38	51.3	48.7
Total	200		138		69

The table above shows that out of 60 primigravidae positive for malaria, 60 were anaemic while only 40 out of 78 multigravidae were anaemic. The percentage is higher in primigravidae (100%) compared with that of multigravidae (51.3%)

Table 4: Percentage of both malaria and packed cell volume among non-pregnant women

Non-Pregnant women	No positive	>33%	≤33%	%prevalence ≥33%	%prevalence ≤33%
Positive	19	18	1	95	5
Negative	81	-	81	-	100
Total	100	18	82		

Table 4 indicate the percentage presentation of malaria anaemia among both pregnant women and non-pregnant women. Out of 19 positives for malaria 18 were anaemic while only one was not anaemic. Out 81 that were malaria negative, non were anaemic, this is an indication that malaria infection is related to anaemia.

Table 5: Percentage presentation of Malaria and Anaemia among Pregnant and non-Pregnant women

Women	Number Examined	No +ve	%+ve malaria	≥33%	No -ve	%-ve malaria	≤33%
Pregnant	200	138	69	100	62	31	38
Non-pregnant	100	19	19	18	81	81	1
Total	100	157			143		

Table 5 shows malaria and anaemia among pregnant women and non-pregnant women.
The pregnant women have higher percentage (69%) in malaria compare with non-pregnant women (19%). The same goes for anaemia where pregnant women have higher percentage of 100% compare with non-pregnant women of 18%. This shows that pregnant women are vulnerable to malaria and anaemia than non-pregnant women

III. DISCUSSION

The prevalence of malaria recorded in this study was 65% among the pregnant women. This observation is lower than some reports in different parts of Nigeria. Ukibe *et al*., (2001) earlier observed malaria prevalence of 73.1% among pregnant women in Anambra State. Iwuchukwu and Vincent reported prevalence of 65.6% among pregnant women attending Federal Medical Center Owerri. In contrast, the current finding is higher than Bello and Ayede who observed prevalence of 4.3% among pregnant women in Ibadan and 10.2% observed in Ethiopia. The primigravidae had the highest prevalence (75%), while the multigravidae had the least prevalence (65%). The higher prevalence observed in primigravidae is consistent with other reports Shulman *et al*, (2002) Anti-adhesion antibodies against chondroitin sulphate A-binding parasites are associated with protection from maternal malaria, but these antibodies develop only over successive pregnancies, hence the susceptibility of primigravidae to malaria infection compared to multigravidae Duffy *et al*., (1999). Some authors also believed that primigravid women have little or no immunity against the infecting strains of Plasmodium and hence suffer adverse complications Beck *et al*., (2001) The finding that higher prevalence of malaria parasitemia was associated with primigravidae status had earlier been noted. Singh *et al* (1999) and Tayo *et al*., (2009). With successive pregnancies, women are exposed to variety of strains of malaria parasite, and may develop efficient mechanism to control infection and prevent disease. Beeson *et al*.,2000 and Beck *et al*., 2001 Primigravidae women have lower immunity against the strains of malaria parasite, hence present more frequently with malaria. Prevalence of malaria and anaemia were higher in pregnant women compared with their nonpregnant counterparts.This was also reported by Nduka and friends reported higher malaria parasitaemia in pregnant women (54%) compared with non-pregnant women of child-bearing age (33%) Nduka *et al*., (2006)

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