

PREVALENCE OF MALARIA PARASITES AMONG PREGNANT WOMEN IN UGHELLI, DELTA STATE

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ABSTRACT

Aim: A total of 200 pregnant women were prospectively studied for malaria parasitaemia from October, 2016 to June, 2017 at the Central Hospital Ughelli, Delta State, Nigeria

Methods: Malaria parasitaemia was determined microscopically using romanowsky staining technique.

Results: Our result shows that the prevalence rate of parasitaemia in 1st, 2nd and 3rd trimesters was statistically significant ($P < 0.05$). However a prevalence rate of 14%, 38% and 11% was obtained for malaria parasite in the 1st, 2nd and 3rd trimester respectively. Also, the age related prevalence of malaria parasitaemia was not statistically significant ($P > 0.05$) among the different age groups. Meanwhile, the highest prevalence rate of 25.5%, 9% and 11% was observed for malaria parasite in the age groups of 25 – 29, 30 – 34 and 20 – 24 years.

Conclusion: This result has confirmed that malaria parasitaemia diagnosis is imperative in antenatal care management of pregnant women.

Key words: Prevalence, Malaria parasite, Pregnancy

INTRODUCTION

Malaria is a life threatening disease transmitted by female anopheles mosquito. It was once thought that the disease came from low-lying water ground hence name malaria (bad air) (Anosike et al., 2006). In 1880, scientists discovered the real cause of malaria, a one-cell parasite called plasmodium (Nwoke and Uwnzie, 2004). Approximately 40% of the world's population mostly those living in the world's poorest countries are at risk of being infected with malaria (WHO, 2003). Today malaria is found throughout the tropical and sub-tropical regions of the world and causes more than 300 millions acute illness and at least one million deaths annually (Nosten et al., 2007). Many children who survive episode of severe malaria may suffer impairment of brain damage and other conditions (Bini et al., 2012). Pregnant women and their unborn children are also particularly vulnerable to malaria (Lindsay et al., 2000). Malaria is a major cause of pregnant mortality, low birth weight and maternal anaemia. The burden of malaria infection during pregnancy is caused mainly by the four species

of malaria parasite: *Plasmodium falciparum*, *P. Ovale*, *P. Vivax* and *P. Malariae*. The most common malaria species in Africa is *P. Falciparum* (WHO, 2008). Malaria infection in pregnancy is more endemic in 103 countries of the world with about 2000 million pregnant women exposed to the infection. The symptoms and complication of malaria during pregnancy differ with the level of immunity the pregnant women have acquired (WHO, 2002). Malaria in pregnancy is higher in the first trimester than in the 2nd and 3rd trimesters (Menendez, 2006). It also have severe consequences which range from anaemia, to severe complication such as cerebral malaria, pulmonary oedema, renal failure in mother, in addition to stillbirth, intra-uterine growth retardation and low birth weight in the foetus (Steketee et al., 2003). Malaria infections have caused a high rate of mortality and morbidity during pregnancy. It has also caused many health problems world-wide resulting to anaemia, kidney failure, shock, low birth weight and spontaneous abortion despite the fact that there are many available drugs for the treatment of the disease (Avwioro, 2010; Avwioro et al., 2010). Malaria control still remains a challenge

in Africa where 45 countries, including Nigeria, are endemic for malaria and about 588 million people are at risk (WHO, 2008). Ochei and Kolhatkar, (2007) stated that in peripheral blood the parasites are present inside the red cells. The pathology associated with malaria during pregnancy is due in part to the ability of parasite to render infected erythrocytes adhesive to host receptors expressed within the placenta, resulting in sequestration of parasitized erythrocytes in inter-villous space (IVS) (Andrews and Lanzer, 2008). Malaria infection caused by *P. falciparum* is a major cause of anaemia in pregnant women resident in hyper endemic areas of Africa. Basically, this is as a result of reduced immunity to malaria in pregnancy (Klufio, 2008). Incidentally, malaria infection is more rampant among the primigravidae and secundigravidae than the multigravidae (Nwagha et al., 2009). Age has also been implicated as previous studies have shown that malaria in pregnancy is more prevalent in younger than older age groups (BouyouAkotet et al., 2003). Therefore this study set to determine the prevalence of malaria parasite among pregnant women so as to enhance proper planning and management in order to reduce health challenges associated with mortality and morbidity during pregnancy.

MATERIALS AND METHODS

Study Area

This study was carried out in Central Hospital Ughelli, Delta State from October, 2016 to June, 2017. Central Hospital Ughelli is a 170 bed hospital located in Ughelli North Local Government Area of Delta State, Nigeria.

Study design

Experimental design was employed for the study. A total of 200 pregnant women were enrolled

into the study by simple random sampling techniques after informed consent.

Sample Collection

Two millimetre (2ml) of venous blood was collected from each subject into ethylenediamine tetra acetic acid (EDTA) container. The sample was mixed gently and labelled with the patient name, date and serial number. All samples were examined immediately after collection.

Sample Analysis

Malaria parasite was identified using thick blood film stained with Giemsa staining technique as described by Cheesbrough (2005).

Ethical Approval

Ethical approval was obtained from the ethical committee of Central Hospital, Ughelli.

Statistical Analysis

Data obtained were presented in tables and analyzed statistically using chi-square for comparing significant variables at 95% confident limit.

RESULTS

Out of 200 pregnant women examined, a total of 126 (63%) were positive for malaria parasite. A prevalence rate of 14%, 38% and 11% were obtained for 1st, 2nd and 3rd trimester respectively. Malaria parasite positive was highly significant ($P < 0.05$) among pregnant women in different trimester (Table 1). Table 2 shows that prevalence rate of 11%, 22.5%, 19%, 6% and 0.5% were obtained for the different age groups 20-24, 25-29, 30-34, 35-39 and 44-40 years respectively. There was no statistical significant difference ($P > 0.05$) in malaria positive pregnant women in the different age groups.

Table 1: Prevalence of malaria parasite in 1st, 2nd and 3rd trimester

Age of pregnancy	No. of tested samples	No (%) positive	No (%) negative	Prevalence	X ²	P-value
First trimester	32	28(87.5%)	4(12.4%)	14%		0.0005
Second trimester	119	76(63.9%)	43(36.1%)	38%	15.7	($P < 0.05$)
Third trimester	49	22(44.9%)	27(55.1)	11%		
Total	200	126(63%)	74(37%)	63%		

Table 2: Age related distribution of malaria parasites among pregnant women

Age (years)	No. tested	No (%) positive	No (%) negative	% prevalence	X ²	P-value
20-24	32	22(68.8%)	10(31.3%)	11%		
25-29	74	51(68.9%)	23(31.1%)	25.5%		0.0516
30-34	67	38(56.7%)	29(43.3%)	19%	9.41	(P>0.05)
35-39	24	12(50%)	12(50%)	6%		
40-44	3	1(33.3%)	2(66.7%)	0.5%		
Total	200	124(62%)	76(38%)	62%		

DISCUSSION

In this study, a prevalence rate of 63% was obtained for malaria parasites. This is evidence that the study area is malaria endemic. The high prevalence rate obtained does not agree with the previous report of Uko et al., (2001) and Ibeziako et al., (2005) who recorded a low prevalence rate of 6.3% and 7.3% respectively. This may be due to the fact that the study was carried out during raining season between the month of October, 2016 and June, 2017, in addition to environmental differences as well as regional differences. This high prevalence rate however agree with the reports of Adefioye et al., (2007), Chukwurah et al., (2003) and Nwagha et al., (2009), who obtained 72%, 63.5% and 58.4% in their studies respectively. This may be attributed to environmental differences and also the attitude of pregnant women for not attending antenatal care (ANC) early in pregnancy, in addition to non compliance of pregnant women to the use of anti malaria drugs and insecticide treated nets. The prevalence rate of malaria parasitaemia obtained within the 1st, 2nd and 3rd trimesters is significant. This agrees with the report of Nwagha et al., (2009) and Nduka et al., (2008), who previously reported a prevalence rate of 20% and 14% respectively. However the similar value obtained showed that malaria is still a major health problem in pregnancy. This may probably be attributed to the expression of adherent proteins on the surface of infected red blood cells (IRBCs), enabling the IRBCs to adhere to micro vascular capillaries of vital organs, in addition to lack of specific immunity to placental malaria and exposure to malaria parasites during pregnancy. Although the age related prevalence rate observed for malaria parasitaemia was not significant, however the

highest prevalence rate was recorded between the age groups of 25-29, 30-34 and 20-24 years. This finding is in consonance with the report of Bouyou-Akotet et al., (2003) and Nwagha et al., (2009), who stated that malaria in pregnancy is more prevalence in the young than the older age groups. This may be due to the fact that anti adhesion antibodies against chondroitin sulphate-A (CSA) binding parasite develop after successive pregnancies in first and second pregnancies. Also, it may be due to immunosuppression associated with pregnancy that occur more in the first than subsequent pregnancies

Conclusion

This study has shown a high prevalence rate of malaria in pregnancy; however there is need to intensify effort in the control and prevention of malaria in pregnancy especially in an endemic area.

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