



## Malaria Parasitemia and Anaemia among Pregnant Women in Umuahia Metropolis

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**ABSTRACT:** A study on the prevalence of malaria parasitaemia and anaemia among pregnant women attending Federal Medical Centre (FMC), Umuahia and Nwachinemere Maternity and Child-Care (NMCCD) Ihie in Umuahia metropolis in Abia State Nigeria was carried out between April and October 2010. Blood samples were collected by vein puncture from 500 pregnant women in different trimesters. 300 FMC and 200 from NMCCD. Presence of malaria parasites was observed microscopically on the thin and thick blood smear prepared from each sample. Data were collected and analyzed statistically using chi-square test. A total of 270 (54.0%) pregnant women out of 500 examined were positive for malaria parasites, while 254 (94.1%) were anemic. FMC had 112 (56.0%) out of the 200 pregnant women examined. There was no significant difference between the results obtained from the two hospitals ( $P>0.05$ ). Peak prevalence was observed in the first trimester 64.1% while the third trimester showed the lowest 50.7%. Prevalence of malaria was also highest among the primigravidae 56.9% and the multigravidae had the least (50.1%). Anaemia of  $Hb<11$  g/dl was observed in 254 (94.1%) out of the 270 positive with malaria parasites. Of the 270 infected women, 254 (94.1%) were anaemia. Malaria and anaemia in pregnancy result to low birth weight, induced abortion and eventual death. Reduction and prevention of morbidity and mortality due to malaria and anaemia were discussed. © JASEM

Malaria is a major public health problem in developing countries causing considerable morbidity and mortality especially in sub-sahara Africa (Das 2000). Mostly affected are children less than five years and pregnant women (Janguet 2001). Increased risk of malaria during pregnancy causes low birth weight and infant mortality during the first of life by inducing intra-uterine retardation, prematurity and infant anaemia (Aribodoret *al* 2007). The disease is currently endemic in 91 countries with small pockets of transmission in a further eight. *P. Falciparum* is the predominant species with 120,000,000. new cases and up to 1,000,000 deaths per year globally. It is this species that has given rise to the formidable drug resistant strain emerging in Asia (Amaliet *al.* 2011). Malaria infections are more common among prime gravidae than in multigravidae and the difference between infected mother depends upon the mean haemoglobin level whereas the mean birth weight are more commonly marked in primigravidae than the multigravidae (Salihyet *al* 2003). However, multigravidae are also valuable to malaria infection because they have a higher incidence of clinical malaria during pregnancy than before or after pregnancy (Diagueet *al* 1997). The peak prevalence of plasmodium falciparum is between 9 and 16 weeks of gestation and decreases later towards delivery. But where the incidence rate remains stable or uniform such changes may be possibly due to a decrease in a post infection recovery rate which could

be as a result of persistent paraestaemia (Duffy and Fried 1999).

Anaemia remains a serious complication of malaria in pregnancy. There is therefore urgent need to curb this menace in pregnant women. This study is designed to determine the prevalence of malaria parasitemia and anaemia among pregnant women so as to provide useful information as well as key guide to relevant stake holders, all levels of government, medical practitioners and individuals towards the reduction of morbidity and mortality during pregnancy as a result of malaria parasitemia and anaemia

### MATERIAL AND METHOD

500 pregnant women were investigated and their blood sampled for malaria parasitaemia and anemia. 300 of them were from Federal Medical Centre (FMC) Umuahia and 200 were from Nwachinemere Maternity and Child Care delivery centre, (NMCCDC) IhieNdume Autonomous Community. Thick and thin blood smears were made from each of these samples stained with Giemsa and then examined under the microscope using x100 objective lens in each case. Identification of species was done using the thin blood smear. The parasites density was estimated and the thick smear under oil immersion and view using x100 objective lens. The determination was done by counting the number of asexual form of plasmodium falciparum parasites

against at least 100-200 leucocytes for definitive count. Samples were estimated for packed cell Volume (PCV) using the microhamematocrit centrifugation while haemoglobin concentration was estimated spectrophotometrically using cyomethaemoglobin method. Haemoglobin of >11g/dl was considered normal and low hemoglobin (anaemia) was considered to be <11-9g/dl whereas <8-7g/dl was considered severe anaemia (Bouyou-Akotet et al., 2003) structured questionnaire was used to access their attitude, perception on causes of malaria and management practices.

**RESULTS AND DISCUSSION**

Of the 500 pregnant women examined for malaria parasites in both hospitals; Nwachinemere Maternity and Child Care Delivery Centre (NMCCDC) and Federal Medical Centre (FMC) Umuahia, 270 (54.0%) Positive for malaria parasites, FMC had 158 (52.7%) and NMCCDC has 112 (56.0%). There is no significant differences in malaria parasitaemia prevalence among the women in the two hospitals (p<0.05).

Out of the 300 blood sample collected from pregnant women in FMC 158 (52.7%) were positive for malaria positive while 112 (56.0%) out of the 200 pregnant women examined in NMCCDC. Ihie were positive for malaria parasite. FMC had the highest prevalence of 62.20% among the 18-20years age group and lowest rate of 51.6%. While NMCCDC had to highest rate of 60.0% among the 28-32 and 43-

47 age groups respectively. The lowest prevalence of 50.0% was observed among the age group of 18-20. This is no significant difference in malaria prevalence among the women in Federal Medical Centre Umuahia and Nwachinemere Maternity and Child Care Delivery Centre IhieNdume. (P<0.05).As shown in table 1. The highest prevalence of 61.1% (96 of 157 examined) was observed among the first trimesters followed by second trimesters with 50.8% and the lowest rate was observed among the third trimesters 50.7%. There was significant difference in malaria prevalence among the groups (P<0.05)

Anaemia Was Observed In 254 (94.1%) out of 270 positive samples for malaria parasite. First trimesters had highest prevalent rate of 61.1% of malaria parasite and anaemia was highest also at that stage . Primigravidea 46.0%, gravidea and multigravidea had 28.3% and 25.6% respectively table 2 Analysis of the questionnaire should that most (90.8%) of the women had formal education 43.2% attributed malaria infection to mosquito bite. Others (35.5%) said malaria is as a result of pregnancy. Some (19.3%) attributed it to taking of oily food. Of the 296 sampled on the method of treatment, 82 (27.7%) indicated buying antimalaria drugs from chemist shop. 14(47.6%) attended hospital while 37 (12.5%) use malaria drugs obtained for chemist shops, local healers and hospitals. While 18(6.1%) women use self medication or do nothing on the management of malaria tables 3 & 4

**Table 1** The Prevalence of Malaria Parasitemia among pregnant woen in both FMC UMUAHIA AND nmccdc IhieNdume

FMC			NMCCDC			
Age group	Total sample	No 1% of +ive samples	Total No of Sample	No. 1% of + ive Sample	Total No of samples in FMC \$ NMCCDC	Total No 1% of ivesamples
13-17	3	3 (60.0%)	2	1(50.0)	7	4(57.1%)
18-22	8	5(62.5%)	9	5(55.6%)	17	10(58.8%)
23-27	87	46(52.9%)	64	34(53.1%)	151	80(53.0%)
28-32	95	49(57.6%)	50	30(60.0%)	145	79(54.5%)
33-37	77	40(51.9%)	50	28(5%0.0%)	127	68(53.5%)
38-42	15	8(53.3%)	15	8(53.3%)	300	16(53.3)
43-47	13	7(53.8%)	10	6(60.0%)	23	13(56.5%)
TOTAL	300	158(52.7%)	200	112(56.0%)	500	270(54.0%)

FMC = Federal Medical Centre

NMCCDC =Nwachinemere Maternity and Child Care Delivery Centre.

**Table 2** Prevalence malaria and anemia by trimester and gravidity

Malaria			Gravidity	Anaemia N=270			
Tremester	No examined	No +ive (%)	Gravidity	No examined	Low HB Moderate (ive 9g/d	Anemia	Ssvweanemia
First	157	96(61.1%)	Primigravidea	117(48.0%)	53(45.3%)	49(41.9%)	15(12.8%)
Second	193	98(50.8%)	gravidiae	72(28.3%)	33(45.8%)	30(41.6%)	9(12.5%)
Third	150	76(50.7%)	Mutigravide	65(25.6%)	30(46.2%)	27(41.5%)	8(12.3%)
Total	500	270		254	116(45.7%)	106(41.7%)	32(12.6%)

**Table 3:** knowledge on causes of malaria and educational qualification

Educational qualification	Total no of respondent (%)	Mosquito bite	Too much oily food	Whenever pregnant	Other insect bite
No formal education	27(9.1%)	0(0.0%)	9(33.3%)	15(55.6%)	3(11.1%)
Primary education	87(29.4%)	21(24.1%)	24(27.6%)	39(44.8%)	3(3.4%)
Secondary education	83(28.0%)	47(56.6%)	15(18.1%)	12(25.3%)	0.0%
Tertiary	99(33.4%)	60(60.6%)	9(9.1%)	30.38	.(0.0%)
Total	296	128(43.2%)	57(9.3%)	105(35.5%)	6(2.1%)

**Table 4:** Malaria management practice by Trimesters

Management practices	First trimester	Second trimesters	Third	Total
Anti-malaria	25(30.5%)	36(43.9%)	21(25.6%)	82(27.7%)
From chemist shop hospitals	45(31.9%)	66(46.6%)	30(21.3%)	141(147.6%)
Anti-malaria drugs from local healers	9(50.0%)	5(27.8%)	4(22.2%)	18(6.1%)
Anti-malaria from chemist shops local healers hospital	12(32.4)	18(48.6%)	(18.9%)	37(12.5%)
None/self medication	6(33.3%)	3(16.7)	9(50.0%)	18(6.1%)
Total	99	129	72	296

**DISCUSSION**

The prevalence of malaria parasitemia among pregnant women in this study was found to be high 54.0%. This is comparable to 54.4% reported by Nwaghaetal (2009) and 63.3% in Awka (Chukwuraetal 2003). The high rate of prevalence observed in recent study could be due to the environmental conditions inherent in Umuahia town and Ihie autonomous Community which favoured plasmodium transmission and also the attitude of the women not starting prenatal care early in pregnancy may also have contributed to the high prevalence the prevalence of malaria parasitemia was high among the primigravidae Table 2. This is in agreement with report of McGregor *et al* (1983) Amaliet *al* (2011) and Bernard (1991) which explained that the high rate of malaria parasitemiaprigravidae could be attributed to the development of new utero-placental vasculature during the first pregnancy which have no previous exposure to malaria parasite infection and thus immunologically naïve thereby permitting parasite colonization. Aribodoret *al*(2007) also suggested that early onset of efficient antibody response in multigravide and the delayed production of antibodies in primigravidae appeared to account for the gravidity dependent and differential prevalence of plasmodium malaria in pregnant women.

Anaemia was observed to be highest among the primigravidae Table2. Similar observations were made by Villageset *al* (1989) and Amaliet *al* (2011).

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They reported that the severity of anaemia among malaria positive patients could be as a result of

excessive destruction of red blood cells by the malaria parasite.

The high prevalence of both malaria and anaemia among the pregnant women in the studied areas is alarming and these will increase the morbidity and mortality in pregnant women as a result of the disease.

The result of the present study has clearly indicated that although 43.2% of the population agree that malaria is caused by mosquito bite,35% said that malaria is associated with pregnancy, others 19.3% and 2.1% attributed malaria to eating of only food and other infect bites aside mosquitoes respectively. This calls for adequate mass enlightenment education by government and relevant bodies on the cause of malaria. Analysis of questionnaire on malaria management practices revealed that majority of the population obtained anti-malaria drugs-malaria the hospital, others access anti-malaria drugs from the local chemist shop, local healers, chemist shops and hospital. Yet some got theirs from local healers and self-medication. The fact that a good number of people by anti-malaria drugs from shops calls for stronger commitment by various authorities to ensure that genuine drugs are in our counters

**REFERENCE**

- Amali, O., Okwori, G. and Awodi N.O. (2011) Malaria and Anaemia among pregnant women in Makurdi Benue State. *The Nigerian Journal of Parasitology* Vol (32) 2:193-196.
- Aribodor, O.N., Nworgu, O.C., Eneanya, C.I. and Aribodor, O.B. (2007) Malaria among primigravid women attending antenatal clinics in Awka, Anambra State, South-east. *The Nigerian journal of parasitology* 28(1) 25-27
- Bernard, J.B. (1991). Malaria, risks during pregnancy. *Transaction of Royal Society of Tropical Medicine and Hygiene.* 13,12-27.
- Bouyou –Akolet M.K, Ionetecollard, D.E, Mabika-Manfoumbi, M., Kendjo, E., Matsiegui, P., Mavouyou, E. and Kombli, M. (2003). Prevalence of plasmodium falsiparium infection in pregnant women in Gabon, *Malaria Journal.* 2:18-24.
- Das, L.K. (2000). Malaria during pregnancy and its effect on foetus in a tribal area of horaput district Orissa, *India. J. Medi.* 37 1-2:11-17
- Diague, N., Cisse, B., Rogier, C. and Trape, J.F. (1997). Incidence of clinical malaria in pregnant women exposed to intense perennial *Transaction of the Royal Society of Tropical Medicine and Hygiene.* 19:166-170
- Duffy, P.E. and Fried M (1999). Malaria during pregnancy, Parasites antibodies and chondroitin sulphate. *Bio-chemical Society Transactions* 27 (4): 478-482.
- Jacquet, O. (2001) The role of rapid diagnostic test in malaria diagnosis. *African Health* 8:7.
- McGregor.I.A. (1987). Thoughts on malaria in pregnancy *Parasitologia* 29:153-163.
- Nwagha, U.I., Ugwu, U.O., Nwagha, T.U. and Anyaehie, U.S.B. (2009). A Symptomatic plasmodium parasitaemia in pregnant Nigeria Women: almost a decade after Roll Back Malaria. *Trans. Roy. Soc. Trop. Med. Hyg.* 103:16-20.
- Salihu, H.M., Naik, E.G., Tchinguen, G. Bosry, J.P.L. and Dagne, G. (2003) Weekly chloroquinepropylaxis and the effect of maternal haemoglobin status at delivery. *Trop. Med. Int. Health* 7(1): 29-34
- Shulman, C.E., Graham, W.J., Jilo, H., Lowe, B.S., New, L. and Obiero, J. (1996). Malaria is an important cause of anemia in primigravidae: evidence from a district hospital in coastal kenya. *Trans. Roy. Soc. Trop. Med. Hyg.* 90(5): 535-539.
- Villages, M.P. (1989), cristol and plasmodium falciparum infection in pregnant women in Kenga *Transactions of Royal Society for Tropical and Medical Hygiene,* 2:178-187
- WHO (1983). Workshop on social Research Methods in Tropical diseases. Working paper for scientific working group on social and economic Research 19-27 April 1995. Kisumu, Kenya occasional paper 42.