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PREVALENCE OF MALARIA PARASITAEMIA AND MALARIA RELATED ANAEMIA AMONG PREGNANT WOMEN IN ABAKALIKI, SOUTH EAST NIGERIA

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ABSTRACT

Background: Malaria currently is regarded as the most common and potentially the most serious infection occurring in pregnancy in many sub Saharan African countries. This study was undertaken to evaluate the prevalence of malaria parasitaemia and malaria related anaemia among pregnant women in Abakaliki, South East, Nigeria.

Materials and Methods: This is a cross sectional, descriptive study conducted in two tertiary health institutions in Abakaliki, South East, Nigeria (Ebonyi State University Teaching Hospital And Federal Medical Centre). Using systematic sampling method, 193 pregnant women were selected from the health institutions for the study. Their blood were analysed for haemoglobin status and malaria parasite. Data were also collected using an interviewer administered questionnaire. All the data were analysed using Epi info version 6 statistical software.

Results : Response rate was 100%. Twenty nine percent prevalence of malaria parasitaemia was detected, more common among primigravidae. Women with higher parity had higher frequency of anaemia in pregnancy. More than half of the pregnant women (51%) were in their second trimester at the time of booking. There was no case of severe anaemia requiring blood transfusion.

Conclusion: Our pregnant women register late for antenatal care. Prevalence of malaria parasitaemia is high in our environment as well as anaemia in pregnancy, using the standard WHO definition. It is suggested that effort should be intensified to make our women register early for antenatal care in order to identify complications early. Intermittent preventive treatment for malaria should be incorporated into routine drugs for antenatal women.

Key Words: Malaria parasitaemia. malaria related anaemia, Abakaliki. *(Accepted 22 January 2008)*

INTRODUCTION

Malaria is a serious public health problem particularly in pregnant women in the tropics. Plasmodium falciparum is responsible for the majority of malaria infections that occur in pregnancy as compared to other variants of the parasite[1]. In many African countries where malaria is holo endemic, non pregnancy female adults eventually achieve a significant level of immunity against malaria. However, during pregnancy, these women experience considerable decline in their levels of immunity to malaria. Several studies have reported that first and second pregnancies are associated with a higher prevalence of malaria parasitaemia in the first half of pregnancy especially in women living in endemic malarious areas[2 6]. Malaria contributes significantly to anaemia in pregnancy[1,7], and is documented to be the most important single cause of moderate to severe anaemia in pregnancy[8], whereas previously it was thought that severe anaemia was mostly due to malnutrition[9]. Aside from anaemia in pregnancy, malaria also causes abortion, intrauterine foetal death and premature labour especially in non immune primigravid women[10-12]. Effective antimalarial chemoprophylaxis is recommended for all pregnant women in endemic areas and for non immune pregnant women visiting these areas to help in the reduction of this malaria burden. Recently, intermittent preventive treatment (IPT) has replaced malarial chemoprophylaxis[8,13,14]. Bearing in mind the endemic nature of malaria and the high rate of malaria related pregnancy complications in Africa, this study is therefore undertaken to evaluate the prevalence of malaria parasitaemia and malaria related anaemia among pregnant women in Abakaliki, South East, Nigeria.

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METHODOLOGY

Study Area

Abakaliki urban is in Abakaliki Local Government Area of Ebonyi State, South East geopolitical zone of Nigeria. This area has rainfalls between April and September. It is a hilly and rocky place with hard and rocky soil strata, which is mixed with clay. This structure does not allow water to pass through easily so the water percolates leaving pockets of ponds after rainfalls. These with rice swamps (by rice farmers) and poor drainage system in the city create a very good breeding area for mosquitoes.

Methods

The study population consisted of pregnant women between the ages of 15 and 45 years, who attended the antenatal clinics in the two tertiary health facilities in Ebonyi State the Ebonyi State University Teaching Hospital (EBSUTH) and Federal Medical Centre (FMC) both in Abakaliki. Routine test for pregnant women registering for the first time include haemoglobin estimation, genotype and blood film for malaria parasite if necessary, but for the purpose of this study malaria parasite investigation was conducted in all the women studied. These women after registration in the antenatal clinics are subsequently placed on routine antenatal drugs and intermittent preventive treatment for malaria. A 1 in 3 systematic sampling method was used to select 193 pregnant women from these health facilities over a 3 month period. Pregnant women with haemoglobinopathies, history of obstetric haemorrhage or other medical problems were excluded in the study. The details of the study were explained to the selected pregnant women and they consented to be used for the study. 5 milliliters of venous blood was obtained from these women, and kept in an ethylene diamine tetra acetic acid (EDTA) containing bottle under aseptic condition.

Malaria parasite smear (thin and thick films) and haemoglobin estimation were determined in each sample using standard laboratory procedures at the medical laboratories of these health facilities by trained scientists. Data were also collected from the women using an interviewer administered questionnaire. The questionnaire contained information on their sociodemographic characteristics and malaria prevalence. Anaemia was recorded if a pregnant woman had haemoglobin of less than 11g/dl[15]. The data were computer analysed using Epi info version 6. Data were also presented as simple frequencies and percentages. The chi square test was used in assessing the significance of associations between variables, with p-values of 0.05 or less ($P <= 0.05$) considered as statistically significant.

RESULTS

There was 100% (193 pregnant women) response rate. Sociodemographic characteristics revealed that the mean age of the respondents was 26.7 ± 5 years. The percentage of the women with primary and secondary education was 64% (Table 1). Thirty two percent of the women were primigravidae while 20.7% were grandmultiparae (Table 2). More than half of the pregnant women (51.3%) were in their second trimester at the time of booking (Table 3). Eighty one (42%) of the respondents had malarial attack prior to booking, 56.5% had no malaria, while 1.5% could not remember. Among the women that reported malarial attack prior to booking were 59.7% of the primigravidae, 31.9% of the primiparae and multiparae and 37.5% of the grandmultiparae. On the other hand, among women that did not have malarial attack prior to booking were 38.7% of the primigravidae, 65.9% of the primiparae and multiparae and 62.5% of the grandmultiparae ($X^2 = 13.06$; $p = 0.0110$) (Table 4).

Table 1: **Selected Socio Demographic Characteristics of Respondents. n = 193**

Characteristics	Frequency	%
Age (Years)		
15 – 19	11	5.7
20 – 24	49	25.4
25 – 29	94	48.7
30 – 34	23	11.9
35 – 39	12	6.2
= 40	4	2.1
Total	**193**	**100**
Educational Status		
No formal Education	29	15.0
Primary	58	30.1
Secondary	70	36.3
Tertiary	36	18.6
Total	**193**	**100**

Table 2: **Distribution of Respondents by Parity**

Parity	Frequency	%
Primigravidae	62	32.1
Primipara and Multipara	91	47.2
Grandmultipara	40	20.7
Total	**193**	**100**

Among the respondents, the occurrence of malaria prior to booking was noted in 49.4% of cases in the first trimester 27.2% in the second trimester and 16% in the third trimester. 7.4% could not remember (Table 5). Malaria parasite was detected in the blood film in 56 (29.0%) of the respondents. Of these, were 20 (32.3%) of the primigravidae, 24 (26.4%) of the primiparae and multiparae and 12 (30%) of the grandmultiparae (Table 6). Eighty six (45%) of the respondents had their Hb level < 11g/dl. Of these were 22 (35.5%) of the primigravidae, 41 (45.1%) of the primiparae and multiparae and 23 (57.5%) of the grandmultiparae (Table 7).

Table 3: **Trimester of Pregnancy among Respondents at the Time of Booking**.

Trimester of Pregnancy	Frequency	%
First trimester	35	18.1
Second trimester	99	51.3
Third trimester	59	30.6
Total	**193**	**100**

Table 4: **Distribution of Respondents by Their Response on Malaria Attack Prior To Booking**.

Malaria Attack	No of Respondents Primigravidae (%)	Primipara and Multipara (%)	Grandmultipara (%)	Total (%)
Yes	37 (59.7)	29 (31.9)	15 (37.5)	81 (42)
No	24 (38.7)	60 (65.9)	25 (62.5)	109 (56.5)
No Response	1 (1.6)	2 (2.2)	- (0)	3 (1.5)
Total	**62 (100)**	**91 (100)**	**40 (100)**	**193 (100)**

$X^2 = 13.06$, d f = 4, p = 0.0110

Table 5:**Trimester of Pregnancy among Respondents, the Period They Had Malaria Attack to Booking. N = 81**

Trimester of Pregnancy The Period of Malaria Attack	Frequency	%
First trimester	40	49.4
Second trimester	22	27.2
Third trimester	13	16.0
No Response	6	7.4
Total	**81**	**100**

Twenty (10.4%) pregnant women had both malaria parasitaemia and haemoglobin level less than 11g/dl (Table 8). The study also revealed that among the 81 (42%) respondents that had malaria attack prior to booking 54 (66.7%) of them had haemoglobin level less than 11g/dl (Table 9).

Table 6: **Malaria Parasite Result of Respondents by Parity**

Malaria Parasite Result	No of Respondents Primigravidae (%)	Primipara and Multipara (%)	Grandmultipara (%)	Total (%)
Positive	20 (32.3)	24 (26.4)	12 (30)	56 (29.0)
Negative	42 (67.7)	67 (73.6)	28 (70)	137 (71)
Total	**62 (100)**	**91 (100)**	**40 (100)**	**193 (100)**

$X^2 =$ 0.6437; d f = 2; p = 0.7248

Table 7: **Haemoglobin Level of Respondents by Parity**

Haemoglobin Level	No of Respondents Primigravidae (%)	Primipara and Multipara (%)	Grandmultipara (%)	Total (100)
< 11g/dl	22 (35.5)	41 (45.1)	23 (57.5)	86 (44.55)
= 11g/dl	40 (64.5)	50 (54.9)	17 (42.5)	107 (55.4)
Total	62 (100)	91 (100)	40 (100)	193 (100)

$X^2 = 4.79$; d f = 2; p = 0.0913

Table 8: **Prevalence of both Malaria Parasitaemia and Haemoglobin Level < 11g/Dl in Some Pregnant Women By Parity.**

Parity of Pregnant Women	Frequency of Both Malaria Parasitaemia and Haemoglobin Level < 11g/Dl	N	%
Primigravidae	7	62	11.3
Primipara and Multipara	6	91	6.6
Grandmutlipara	7	40	17.5
Total	**20**	**193**	**10.4**

Table 9: **Haemoglobin Level of Respondents That Had Malaria Attack Prior To Booking**.

Haemoglobin Level	No Of Respondents That Had Malaria Attack Prior To Booking			Total (%)
	Primigravidae (%)	Primipara and Multipara (%)	Grandmultipara (%)	
< 11g/dl	21 (56.8)	23 (79.3)	10 (66.7)	54 (66.7)
= 11g/dl	16 (43.2)	6 (20.7)	5 (33.3)	27 (33.3)
Total	**37 (100)**	**29 (100)**	**15 (100)**	**81 (100)**

$X^2 = 3.721$; d f = 2; p = 0.1556

DISCUSSION

Many of the respondents in this study (82%) registered for antenatal care in their second or third trimester of pregnancy. This seems to be a common practice in Africa as it conforms to the study conducted in Zaire[16], where most of the pregnant women attended antenatal clinics for the first time in their sixth or seventh month of gestation and made three to four visits before delivery. This practice is detrimental as it does not allow for early detection and correction of pregnancy complications, such as anaemia. There is great need to educate our women on the need to register early for antenatal care. In the women that reported malarial attack in the index pregnancy prior to booking, the primigravidae experienced malarial attack more than any other parity, an observation also noted by other authors [26]. This has been attributed to the substantial reduction in levels of immunity associated with first and second pregnancies.The study also revealed that among the respondents that have had malaria, 49.4% were in their first trimester of pregnancy and 27.2% in their second trimester. This finding conforms to studies earlier conducted[17]. This is so because it is known that in holo endemic areas, parasite density and clinical malaria are most prevalent in the first trimester and early second trimester of pregnancy, as this corresponds to the period during which there is the most significant decrease in humoral and cell mediated immunity to malaria.Malaria parasitaemia was found in 29% of the women, of which were 32.3% of the primigravidae and 26.4% of primiparae and multiparae. Similar studies recorded = 16% incidence of malaria parasitaemia[18,19]. Haemoglobin level < 11g/dl was found more in women with higher parity than in primigravidae. This maybe due to repeated pregnancies at shorter intervals without allowing for replenishment of the iron stores. There is definitely need for further research on this. There was no recorded case of blood transfusion in all respondents that had anaemia, as has been advocated In cases of severe anaemia in pregnancy.

In conclusion, malaria parasitaemia and anaemia in pregnancy are common medical conditions associated with pregnancy especially in the developing world. Early antenatal registration, regular attendance at antenatal clinics and judicious use of the newly recommended intermittent preventive treatment (IPT) for malaria will reduce the morbidity and mortality associated with this problem.

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