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Prevalence of Plasmodium Falciparum Malaria and the Antenatal Health Care Utilization for Prevention Among Pregnant Women in a Secondary Health Facility in Enugu State, Nigeria.

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INTRODUCTION

Pregnant women in endemic areas are highly susceptible to malaria, and both the frequency and severity of the disease are higher in pregnant women than non- pregnant women.[1] In pregnancy, there is a transient depression of cell mediated immunity that allows foetal allograft retention but also interferes with resistance to various infectious diseases. Malaria infection during pregnancy is a major public health problem in the tropics and subtropics. It affects approximately 24 million pregnant women. [2] In the area of Africa with stable malaria transmission, plasmodium falciparum infection during pregnancy is estimated to cause as many as 10,000 maternal death each year, 8-14% of all low birth weight babies and 75,000-200,000 of all infant death.[3] In Nigeria, there is an estimated 25-30% of mortality in children under the age of five and 300,000 death each year due to malaria.[3] Studies have shown that 40% of pregnant African women start attending antenatal clinics in the first and second trimester of their pregnancy. [3] In addition, pregnant women are at immense risk of malaria due to natural immune depression in pregnancy. [4] The symptoms and complications of malaria during pregnancy differ with the intensity of malaria transmission and thus with the level of immunity the pregnant woman acquired. [5] Malaria cases and death have been increasing in the country mainly due to injudicious use of anti-malaria drugs, delayed health seeking and reliance on clinical judgment without laboratory confirmation in most of the peripheral health facilities. [6] There have been considerable numbers of reports about knowledge, attitude and

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and practices relating to malaria and its control from different parts of Africa. Misconceptions concerning malaria still exist and the practices for the control of malaria have been unsatisfactory. [7] The promising news is that during the past decade, potentially more effective strategies for control of malaria in pregnancy have been developed and demonstrated to have a remarkable impact on improving the health of mothers and their new born. However, less than 5% of pregnant women have access to effective plasmodium specie prevention during pregnancy. [8]

Malaria in pregnancy increases the chances of maternal anemia, miscarriages, stillbirths, low birth weight, abortion, growth retardation and death. It therefore becomes pertinent to study the prevalence of *Plasmodium falciparum* malaria among pregnant women attending antenatal clinic in Bishop Shanahan Hospital Nsukka as well as to ascertain their use of some of the antenatal health care services for prevention during pregnancy.

MATERIALS AND METHODS

Study Design

The study was a descriptive, prospective, cross-sectional survey that was conducted between May and August 2017 at Bishop Shanahan Hospital Nsukka.

Study Area:

Nsukka is a town and a Local Government Area in South-East Nigeria in Enugu State.

Bishop Shanahan Hospital is a Missionary hospital own by a Diocese of Nsukka. It was founded in 1932 by Bishop Charles Henry. School of Midwifery started in 1952, school of Nursing in 1962 and school of Laboratory Technician in 2001.

Bishop Shanahan Hospital has approximately 250 beds and provides a wide spectrum of services including antenatal health care services for pregnant women. The antenatal clinic holds every Wednesday and an average of forty pregnant women attend the clinic on weekly basis. It is seen as the center of health care for people in and around Nsukka.

The hospital also provides education and training for hundreds of nurses, midwives, and laboratory professionals.

Study population

All pregnant women attending antenatal clinic at Bishop Shanahan Hospital Nsukka between July and September 2017.

Sample Size

There were about 600 pregnant women attending antenatal clinic at bishop Shanahan Hospital Nsukka but within the time of this study only a total of 81 pregnant women were sampled for the study.

Study Instrument

A self-administered questionnaire was used to obtain the necessary information from the respondents. The questionnaire has three sections: Section A was designed in such a way as to capture the respondents socio-demographic profiles while questions concerning age, gravidity, pregnancy stage, fertility, were captured in section B. Section C has two questions on the maternal health care utilization.

Study Procedure

Among the 81 pregnant women selected, peripheral blood samples were collected and tested for detection of malaria parasite during their antenatal visits.

Ethical Considerations

Ethical approval was granted for this study by the Health Research Ethics Committee of the University of Nigeria Teaching Hospital, Ituku-Ozalla, Enugu State, Nigeria. The permission approval number is NHREC/05/01/2008B-FWA00002458-1RB00002323.

During the visits, the management and health workers in charge of antenatal services and laboratory scientists were informed, consent of both management and the pregnant women were sought and obtained before the commencement of the study.

Only respondents who agreed to participate in the research were considered for selection. Strict confidentiality of respondents' information was maintained during and after data collection.

Data Analysis

Data were analyzed using Statistical Package for Social Services (SPSS) version 16.0. Social demographic variables were presented as frequencies and percentages while association between variables (demographics and antenatal health care service utilization as well as demographics and malaria parasite test) were tested using chi-square with level of statistical significances set at $P<0.05$.

RESULTS

TABLE 1: SOCIO-DEMOGRAPHICS OF THE RESPONDENTS N = 81

Variables	Frequency(n)	Percentage (%)
Age group		
<25	14	17.3
25-30	33	40.7
>30	34	42.0
Attended formal school		
Yes	75	92.6
No	6	7.4
Occupation		
Housewife	18	22.2
Farmer	8	9.9
Government Employee	13	16
Business	38	46.9
Student	4	4.9
Highest Grade completed		
Technical/Vocational certificate	38	46.9
University/College Diploma	24	29.6
Degree	19	23.5
Marital status		
Married	65	80.2
Single	8	9.9
Widowed	6	7.4
Separated	1	1.2
Respondents' Religion		
Islam	4	4.9
Protestant	25	30.9
Catholic	52	64.2
Number of pregnancy		
Primigravid	24	29.6
Multigravid	57	70.4
Trimester		
First	4	4.9
Second	35	43.2
Third	42	51.9
Time of commencement of antenatal care		
First	42	51.9
Second	39	48.1
Haemoglobin Level		
<8g/dl	8	9.9
8-9g/dl	33	40.7
10-11g/dl	39	48.1
Malaria parasite test		
Negative	34	42.0
Positive	45	55.6

TABLE 2: ASSOCIATION OF SOCIO-DEMOGRAPHICS WITH MALARIA PARASITE TEST RESULT

Variables	MALARIA PARASITE TEST		P. VALUE
Age group	**NEGATIVE (%)**	**POSITIVE (%)**	
<25	10(71.4)	4(28.6)	
25-30	10(31.2)	22(68.8)	0.04
>30	14(42.4)	19(57.0)	
Attended formal school			
Yes	33(44.6)	41(55.4)	
No	1(20.0)	4(80.0)	0.28
No. of pregnancies			
Primigravidae	11(47.8)	12(52.2)	
Multigravidae	23(41.1)	33(58.9)	0.38
Time of commencement of antenatal care			
First trimester	22(52.4)	20(47.6)	0.06
Second trimester	12(32.4)	25(67.6)	
Trimester			
First	1(25.0)	3(75.0)	
Second	15(42.9)	20(57.1)	0.74
Third	18(45.0)	22(55.0)	
Haemoglobin Level			
<8g/dl	0(0.0)	7(100.0)	
8-9g/dl	4(12.1)	29(87.9)	0.00
10-11g/dl	30(76.9)	9(23.1)	

TABLE 3: ANTENATAL HEALTH CARE SERVICE UTILIZATION FOR MALARIA PREVENTION.

Questions	Frequency (%)
Do you use mosquito net while sleeping	
Yes	46(57.5)
No	34(42.5)
Do you take preventive malaria drug	
Yes	61(76.2)
No	19(23.8)

Average mean score = 37.2%

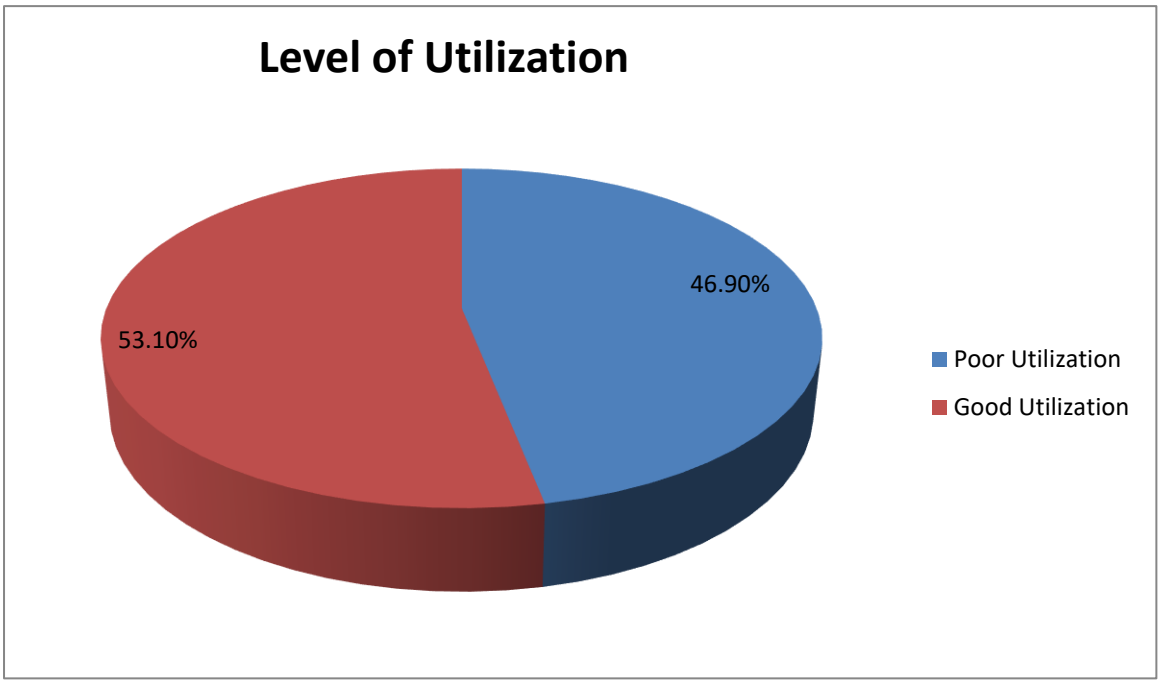

FIGURE 1: LEVEL OF ANTENATAL HEALTH CARE UTILIZATION FOR MALARIA PREVENTION

DISCUSION

This hospital-based assessment of malaria parasitemia among pregnant women in Bishop Shanahan Hospital Nsukka , Enugu State, Nigeria was of special significance since malaria is an important cause of severe anemia in pregnant African women. Our findings showed that more than 50% of the participants had positive malaria test. This result was in contrast with a similar study which recorded lower prevalence rate of 22.4% [9]. Reports by Akinboye *et al*.[10] and Raimi *et al*,[11] however had similar high rates of 72%, and 52% respectively among the participated pregnant women.

In relation to the parity, the prevalence of parasitemia was higher among the multigravidae (more than one pregnancies) than the primigravidae. In contrast, a previous similar study conducted in another malarious country recorded more infections in the primigravidae women than the multigravidae.[12]. In addition,Walker- Abbey *et al*. also reported that malaria infections in paucigravidae (that is women in first and second pregnancies) were higher than in multigravidae [13]. These previous studies indicated strong relationship between parity and malaria infection with mean parasite density levels decreasing as the number of gestation is increased thus suggesting that the African Primigravidae remain unquestionably the most susceptible [14]. Thus, the hypothesis of the acquaintance of pregnancy-specific immunity with successive pregnancies [15] was well realized by these studies. However, Dicko et al [16] recorded that the protective immunity in pregnancy is not a function of parity. One of the surprising findings in this study was that none of the pregnant women complained of nor showed symptom(s) of malaria but tested positive to the parasitemia level of (++) in their blood group sample when analyzed. Malaria infection is highly controlled by the immune system and as such may be clinically unrecognized unless diagnosed or investigated making pregnant women to be particularly at risk. [17]

This study in relation to trimesters showed that prevalence of maternal malaria and the parasite density was highest among women in their first trimester followed by those in the second

trimester, while those in their third trimester had the least parasite density (Table 2). This finding contrasted with that [12] conducted in Eastern Sudan where the risk of malaria infection was significantly associated with the third trimester [18] but corresponds with studies conducted in Bandiagaru Mali which also recorded high levels of malaria parasites among pregnant women in their first trimester of gestation. [16]

There was a significant relationship between malaria parasite test and age of these women (Table 2). Younger women, between the ages of 25 and 35 appear to be the most susceptible age group to malaria in this study. This contradicted the findings of Adefioye *et al.,*[19] that found 36-39 years age group to be most susceptible. However, Dicko *et al*[16]opined that adolescents and young adult pregnant women were more susceptible to malaria than older pregnant women because of continuous development of malaria immunity in younger women. Furthermore, a significant statistical association exists between level of haemoglobin and malaria parasite test as women with haemoglobin level<8g/dl were found to have tested more positive to malaria parasite test ($p<0.05$). In fact the seven pregnant women (with haemoglobin level <8g/dl) examined for malaria parasite all tested positive. This was an expected result as literature has shown that low haemoglobin concentration is a risk factor for anemia which is a consequence and complication of malaria infection. Similar study[18] had also recorded the same result.

The World Health Organization recommends the use of intermittent preventive therapy as well as insecticide treated nets (ITN) during pregnancy for malaria prophylaxis. This study was conducted to assess malaria prevention with emphasis on insecticide treated net (ITN) use and on the need for taking preventive malaria drugs among pregnant women. The overall usage of antenatal health care service for malaria prevention was found to be high (Table 3). Based on their mean score of 37.2%, greater percentage had good utilization of these services(that is scored above the mean) (Fig. 4).In fact the result of this study recorded 100% utilization of these services as far as first trimester is concerned (table 5). This finding varies with the submission of Fawole and Onyeaso [20] who showed that even among health workers in Ibadan, Southwest Nigeria, knowledge and use of malaria prevention was poor. However, this finding agrees with the conclusion of Adegun, Adeboyega and Awosusi, [21] and Onewole and Ibidapo[22] who showed that the general knowledge about malaria prevention among urban residents in Southwest Nigeria was good. The antenatal health care service usage seen among respondents in this study could be as a result of good exposure to health education messages regarding malaria prevention. The relatively poor utilization of antenatal care service might be that some of the respondents found it difficult to understand malaria prevention information given during antenatal clinics. This might partly be due to inappropriate means of communication and delivery of these messages by the health workers in addition to low level of education of the respondents.

4.1 CONCLUSION

The study showed that the prevalence of *Plasmodium falciparum* malaria was high despite the fact that most of these women had good utilization of ante natal health care services for malaria prevention. The study also revealed that only trimester had statistical significant association with the level of antenatal health care utilization for malaria prevention during pregnancy. The respondents' social demographics had nothing to do with their malaria parasite test except age group and hemoglobin level. There is need for continued enlightenment of these women about malaria and its preventive measures especially during pregnancy.

AUTHORS' CONTRIBUTION

Akunne M designed the study, contributed in the data analysis and wrote the manuscript.

Ayogu E reviewed the written manuscript and also participated in data analysis. Idoko J collected data. All the authors critically revised and approved the final manuscript.

CONFLICT OF INTEREST

We declare no conflict of interest.

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REFERENCES

1. Marielle KBA, Ionete-Collard DE, Modeste MM, Kendjo E, Matsiegui PB, Elie M, Kombila M. Beralence of *Pasmodium falciparum* Infection in Pregnant Women in Gabon. *Malaria Journal* 2003; 2 (18): 1-7.
2. Ihemanma CA, Wuche CJ, Okorie AC. Impact of *Plasmodium falciparum* on Some Haemotological Parameters of Pregnant Women Attending Antenatal Care in University of Port Harcourt Teaching H ospital (UPTH), Rivers State, Nigeria. *J. Bio. Innov.* 2016;5(2) 225-236.
3. Odikamnoro O, Iganga A, Ozowara NL, Oko N. Prevalente of Malaria Among Pregnant mothers and Possible Relationship to Parity in Abakaliki, Southeast Nigeria. *European Journal of Experiemtal Biology*, 2014;4(4): 1 5 – 19.
4. Plebanski M, Hill AV. The Immunology of Malaria Infection. *Curr. Opin.*
    a. *Immunol*., 2000;12 (4) 437-441.
5. Perlmann P, Troye – Blomberg M, Immunity to Malaria. *Am. J. Immulogy*, 2000;80: 229-242.
6. Vander HW, Presmasiri DA, WIckremasinglhe AR. Current Trends in the Control of Malaria: *Case Management. J. Jrop. Med. Public Health*. 2005;29: 242-245.
7. Deressa W, Ali A, Hailemariam D. Malaria Related Health – Seeking Behavior and Challenges for Care Providers in Rural Ethiopia: Implications for Control. *J. Biosoc. Sci.* 2008;40: 115-35.
8. . World Health Organisation. (2007). Malaria in Pregnancy. *www.who.int/malaria* accessed on 14 Aug.2017.
9. Ebenezar A, Daworiye P, Enaregha E. Patterns of *Plasmodium falciparum* Malaria among Pregnant women attending Antenatal clinic in the communities along the Epie Creek, Bayelsa State, Nigeria: Annals of Biological Research, 2016, 7(6): 1-5. Available@ www.scholarsresearchlibrary.com.
10. Akinboye D, Ikonofua O, Awodele O, Agbolade O. Ayinde O, Rebecca S, Haruna Y. The influence of malaria on some Haematological Parameters in Pregnancy. *Nig. J. Parasitol,* 2011, 32(2):187– 191.
11. Raimi O, Kanu C. The prevalence of malaria infection in pregnant women living in a suburb of Lagos. *African .J.Biochemistry Research*, **2010**, 4(10): 243-245.
12. Nair LS, Nair AS. Effect of Malaria Infection on Pregnancy. *Indian Journal of Malariology,* 1993;30(4):207-14.
13. Walker-Abbey A, Djokam R, Eno A, Leke P, Titanji V, Fiagako J, Sama G, Thuita L, BeardsleeE, Snounnou G, Zhou A, Taylor D Malaria In Pregnant Cameroonian Women: The Effect Of Age And Gravidity On Submicroscopic And Mixed-Species Infections And Multiple Parasite Genotypes. Am. J. Trop. Med. Hyg., 2005, 72(3): 229–235.
14. World health organization. WHO Informal Consultation on Recent Advances in Diagnostic Techniques and Vaccines for Malaria. A rapid Dipstick Antigen Capture Assay for for the Diagnosis of *falciparium* Malaria. *Bull World Health Organization* 2003, 74:47-54.
15. I.A. McGregor. *Trans Roy. Soc. Trop Med. Hyg* , **2002**,77, 232-244.
16. Dictko A, Mntel C, Thera M, Doumbia S, Diallo M. Risk Factors for Malaria Infection and Anaemia for Pregnant Women in the Sahel Area of Bandiagara, *Mali Acta. Trop*., 2003, 8 (9): 17 – 23.
17. World Health organization. A strategic Frame Work for Malaria Diagnosis in African Region. WHO Document .AFR/MAL/02/0 2002;1:6-9.
18. Adam I, Khamis AH, Elbahir MI. Prevalence and Risk Factor for *Plasmodium falciparum* Malaria in Pregnant Women of Eastern Sudan. *Malaria journal* 2005;4,18-
19. Adefioye OA, Adeyeba OA, Hassan WO, Onyeniran OA. Prevalence of Malaria parasite infection among pregnant women in Osogbo, Southwest Nigeria. American Eurasian Journal of Scientific Research, 2007;2(1):43-45.
20. Fawole AO, Onyeaso NC. Perception and practice of Malaria Prophylaxis in Pregnancy Among Primary Health Care Provider in Ibadan, Nigeria *West African journal of medicine,* 2008; 27:92-96.
21. Adegun JA, Adegboyega IA, Awosusi AO. Knowledge and the Preventive Strategies of Malaria Among Migrant Farmers in Edo-Ekiti Local Gorenment Area of Ekiti State, Nigeria. *American Journal of scientific and industrial Research* 2011;2:883-889.

22. Onyewole IO, Ibidapo AC. Attitude of Malaria, Prevention, Treatment and Management Strategies Associated with the Prevalence of Malaria in Nigeria Urban Center. *African Journal of Biotechnology* 2007;6:2424-2427.