Available online at www.scholarsresearchlibrary.com

Scholars Research Library

Annals of Biological Research, 2016, 7 (6):1-5
(http://scholarsresearchlibrary.com/archive.html)

Annals of Biological Research
Scholars Research Library
ISSN 0976-1233
CODEN (USA): ABRNBW

Patterns of *Plasmodium falciparum* Malaria among Pregnant Women Attending Antenatal Clinics in the Communities along the Epie Creek, Bayelsa State, Nigeria

Amawulu Ebenezer, Daworiye P. Stephen and Esther B. Enaregha

Department of Biology, Isaac Jasper Boro College of Education, Sagbama, Bayelsa State

---

ABSTRACT

Pregnant women living in many parts of Africa have increased risk of malaria infection, but limited data exist in Yenagoa, Bayelsa State. Ninety eight (98) pregnant women were recruited from three randomly selected Health Centres located in communities along the Epie creek. Upon consent, 2ml – parts of intravenous blood was collected from each of the recruited pregnant women. A thin and thick blood film was prepared in a grease free slide and stained in 3% geisma. The malaria positive slide and parasite density of each slide was determined according to standard procedures. Out of the 98 pregnant women examined for malaria parasites, 22 (22.4%) were positive. Plasmodium falciparum accounted for 100% of the total positive slides. The prevalence of P. falciparum by location were, Agudama (30%), Yenizue-gene (24%), and Amarata (14.3%), P>0.05. Infections decreased as the age increases and peak (28.0%) at age 25yrs; P<0.05. Primigravidae women were more infected (37.5%) than multigravidae (15.2%). Infection rates decreased in the order of increasing trimester; 1st trimester > 2nd trimester > 3rd trimester. P. falciparum infections were more predominant in pregnant women with Hb level lower than 8g/l. These results highlighted the malaria status among pregnant women in Bayelsa State and therefore call for a public Health interventions.

Keywords: *Plasmodium falciparum*, pregnant women, antenatal clinic, Epie creek, Bayelsa State.

INTRODUCTION

Malaria, more than any other parasitic diseases of public health importance is confined almost exclusively in 100 African countries [1]. Over 40% of the world population are at risk of malaria infection while 300-500 million people suffers and dies of the infection annually [2]; children < 5 years and pregnant women are the most affected [3].

The burden of malaria infections are twice more likely in pregnant women than in non-pregnant women [4] and are the predominant causes of maternal mortality, small to date birth, low birth weight febrile attack and anaemia, interrupted pregnancy[5-9]. In Nigeria alone, over 48% of the pregnant women have been diagnosed of malaria [10] and > 20% of the total hospital admission in Bayelsa State has been attributed to malaria infections [11]

Highlighting the prevalence and risk factors associated with malaria infection during pregnancy is a pre requisite to mounting long term control strategy in malaria endemic areas [12-14]. Although, much work has been published on the prevalence of malaria infection among pregnant women in Nigeria and beyond [5, 8, 9, 14, 15, 16], paucity of

information exist in Yenagoa. This research is therefore aimed at assessing the prevalence and infection patterns of *P. falciparum* malaria among pregnant women attending antenatal clinic in the communities along the Epie creek. It is believed thatthe information this study may generate would be useful for designing malaria control strategy in the area.

MATERIALS AND METHODS

Study Area: The communities in the Epie creek are the host community of the municipal Yenagoa and the head quarter of Bayelsa State. They are situated along the Mbiama-Yenagoa Road. The Epie creek emanates from the Orashi River of Rivers State and empties into the River Nun [17]. There are 16 communities that are situated along the Epie creek; (table1) and five Government owned health centers; three were randomly selected for the studies. Details about the study area have been exclusively described in Ebenezer *et al*.[18].

Table 1: **Communities situated along the Epie creek**

S/N	COMMUNITIES
1.	Igbogene*
2.	Yenegwe *
3.	Akenfa
4.	Agudama**
5.	Akenpai
6.	Edepie
7.	Etegwe
8.	Okutukutu
9.	Opolo
10.	Biogbolo
11.	Yenezue-gene **
12.	Kpansia
13.	Yenezue-Epie
14.	Okarka
15.	Ekeki
16.	Amarata**

**Communities with Health Centre*
***Community Health Centres selected for the study*

Ethical consideration: Approved consent of the study was obtained from the Director, Primary Health Care (PHC), Ministry of Health, Bayelsa State, and the resident doctors of the various selected health centers. The permission from the pregnant women was sought for before the collection of blood.

Population and blood sample collection:
The populations were all the pregnant women presented at the selected Health centers. Selection of population was based on consent until a sample size was attained. Calculation of sample size was done as per Cochran [19]

$$n = \frac{z^2pq}{d^2}$$

Where n= sample size
z = standard normal deviation at 0.05 Probability level
p = prevalence from Preview studies
q = 1-p
d = tolerance limit at 0.05

Two milliliters (2ml) of intravenous blood was collected from each of the consented pregnant women into an EDTA bottle and labeled. Each bottle was assigned two grease free microscopic slides. A thin and thick blood film was made on the microscopic slide and stained in 3% Geisma. Details of staining technique and parasite identification followed standard procedures [20]. Parasitaemia were calculated by the total number of positive slides. The parasite density of each of the positive slide was determined according to the method in Parise *et al.* [21]. A negative slide was finally confirmed by experienced laboratory scientist after viewing for at least 50 fields and no parasite was seen

Data Analysis

Percentages of positive slides were calculated from the total number of sample assessed. Significant differences between malaria infections and location, age, gravidae and trimester were determined using chi-square as statistical tools in SPSS software (version 17.0)

RESULTS

A total of ninety-eight (98) pregnant women were examined for malaria infection. Twenty two point four percent (22.4%) were positive. *Plasmodium falciparum* accounted for all the positive slides. The prevalence rates of *P. falciparum* by the study locations were Agudama (30%), Yenizue-gene (24%) and Amarata (14.3%). Differences in the prevalence rates by location was not significant (P>0.05), (Table 2). Age – specific prevalence of *P. falciparum* among the pregnant women decreased as the age increases. Higher prevalence (28%) was recorded in pregnant women below 25years, followed by 26-30 years(18.4%) while the least prevalence rates (10%) was recorded in the age bracket >30 years old. Differences in age-related prevalence rates was significant (P<0.05), (Table 3).The prevalence rates of *P. falciparum* decreases with increase in the number of gravidae. Primigravidae pregnant women had higher prevalence rates (37.5%) than the multigravidae (15.2%). Differences were significant (P<0.05), (Table 4). Prevalence rates also increases with the increase in the number of trimester in the increasing order as 1 st trimester> 2nd trimester > 3rd trimester (table 5).

Infection with *P. falciparum* malaria was associated with the hemoglobin level of the pregnant women. More infections (37.5%) were recorded in the pregnant women with Hb<8g/l while Hb range of 8-9g/l was associated with moderately high infection (33.3%). Hb range of 10-11g/l accounts for a lower malaria infection rates (13.8%) (table6).

Table 2: Prevalence of *P. falciparum* by study locations

Location	No Examined	No Positive	% Positive
Agudama	20	6	30. 0
Yenizue-Epie	50	12	24. 0
Amarata	28	4	14.3
Total	**98**	**22**	**22.4**

Table 3: Prevalence of *P. falciparum* by Age

Age	No Examined	No Positive	% Positive
< 25	50	14	28.0
26-30	38	4	18.4
> 3	10	1	10.0
Total	**98**	**22**	**22.4**

Table 4:Prevalence of *P. falciparum* by gravidae

Gravidae	NO Examined	No Positive	% Positive
Primigravidae	32	12	37.5
Multigravidae	66	10	15.2
Total	**98**	**22**	**22.4**

Table 5: Prevalence of *P. falciparum* by trimester

Trimester	No Examined	No Positive	% Positive
First	8	1	12.5
Second	34	6	17.6
Third	56	15	26.8
Total	**98**	**22**	**22.4**

Table 6: Hb – related Prevalence of *P. falciparum*

Hb Level	No Examined	No Positive	% Positive
< 8	16	6	37.5
8 -9	24	8	33.3
10 -11	58	8	13.8
Total	**98**	**22**	**22.4**

DISCUSSION

Prevalence of *Plasmodium falciparum* among the pregnant women in the study locations was 22.4% and is said to be moderately high [20]. This result contrasted similar reports of Akinboye *et al.* [9] and Raimi *et al.* [23] who recorded high prevalence rates of 72% and 52% respectively among pregnant women.

The non-significant differences observed in the prevalence rates of *P. falciparum* at the different locations of the Epie communities is an indication that there are uniform environmental factors that may have supported the development of the malaria parasites both in the insect vectors and in human [24, 25]. Variations of age specific prevalence of malaria infection among the pregnant women highlighted the importance of acquired immunity to infectious diseases as a result of prolong exposure to malaria parasites over time [8, 26].

More infections in the primigravidae women than the multigravidae; third trimester women than second and first trimesters in this study agrees with AlNongzhol *et al*. [27] who also reported that malaria infections in primigravidae pregnant women were twice more likely than in multigravidae. This present study appreciated the hypothesis of the acquaintance of pregnancy-specific immunity with successive pregnancies [28].

The significant relationship between malaria infections and hemoglobin level in pregnant women agrees with Amali *et al* [8]. Higher malaria prevalence rates have been associated with low Hb level [9].This may be one of the causes of malaria- related anaemia among pregnant women in Bayelsa State.

CONCLUSION

The study has revealed that *Plasmodium falciparum* is moderately endemic among pregnant women in some parts of Bayelsa State and may increase more than necessary if prompt intervention is not expedited. Malaria parasitaemia depended on the Hb level. Government and other Health agency should therefore intensify the advocacy of the routine intermittent preventive treatment of malaria during pregnancy as recommended by World Health Organization.

Acknowledgement
The assistance and approval of the Director, Primary Health Care (PHC) of the Ministry of Health, Bayelsa State is acknowledged. We also appreciate the consent of the pregnant women for willingly releasing themselves for the study. We would like to particularly thank the resident doctor, the medical laboratory technologist and other staff of the Health Centre for assistance in the sample collections.

REFERENCES

[1]WHO **2006**, World Health Statistics, NHS, Nigeria fact sheet, No 3. P7.
[2]WHO **1999**, Expert committee on vector Biology and control, Geneva, 6th -10th Dec, **1999**.
[3] WHO **2005a**, Making every mother and child count. World Health Report
[4] B.J, Brain. *Bull World Health Org*. **1998**, 61, 1005-1016
[5] E. Savage, K, Msyamboza, S. Gies, D. Alessaudro. *Biomedical Journal of Obsteteric and Gynaecology*,**2007**,114, 1222-1231.
[6] C.O. Falade, B.O. Yusuf, F.F. Fadero, D.A. Mokolu, D.A. Hamer, and L.A Salako. Intermittent preventive treatment with sulfadoine pyrimethamine is effective preventing maternal and placental malaria in Ibadan; South western Nigeria. *Malaria Journal.* **2007**, 6, 88.
[7] RBM **2005**, Facts about malaria in Nigeria, Abuja. *Publication of the Roll Back malaria* PP. 1-2
[8] D.O Akinboye, , O. Ikonofua, O. Awodele, O.M. Agbolade, O.O. Ayinde, S.N. Rebecca, and Y. O. Haruna, *Nig. J. Parasitol*, **2011**, 32, 2,187– 191.

[9] FMH **2005b**, Malaria Desk situation Analysis Federal ministry of Health. *Publication of Federal Ministry of Health*, Nigeria. PP. 27,
[10] k. Imananagha, *Ann. Trop Med Public Health*, **2010**, 3, 86-71.
[11] U, Brinkman. *Journal of Trop. Med and Parasitology*, **1991**, 42: 204-213.
[12] B Green Wood, *Bulletin of the World Health Org*.**1999** PP. 28-30.
[13] I. Muller, S. Rogerson, G.D.L Mola, and J.C. Reader,. *PNG Med. Journal*, **2008**, 15,1-2, 12-16.
[14] N.S. Adebayo, W.A. Oladele, A.W, Olalokan, A.R .Akintunde. *JPCS*, **2011**. 3, 42-52
[15] O. Amali, G. Okwori, N.O. Awodi. N.O *Nig. J. Parasitol*, **2011**, 32(2):193-196
[16] K.B.A. Marielle,E.I.C.,Danisa, M.M. Modeste, K.Eric, B.MPierre,M. Elie, Maryrome, K *Malaria journal*, **2003**, 2:1-17
[17] E.J. Alagoa. **1999**, The land and people ofBayelsaState, central Niger Delta. *Onyoma Research Publication, choba, Port-Harcourt* PP.167
[18] A .Ebenezer, E.C. Amadi, and P.I. Agi, *Int.Res. J. Microbiology*, **2011**, 2, 9, 370-374
[19] N.O.Cachran. **1999**, Sampling techniques, 3rd edn. John Wikey and Sons, London. PP. 72-82
[20] WHO. **2003**. Malaria Entomology and vector control, Learners guide trial Edn, WHO/CPS/CPE/SMT/**2002** 18 Rev. 1 Part 1; PP 55-58
[21] E.M.Parise, G.J.Ayisi, L.B.Nahlam, J.L. Schuttz, M.J.Roberts, A. Misore, R. Muga, J.A. Oloo, W.R. Steketee. *Am. J. Trop. Med and Hyg*. **1998**, 59, 81, 3-822
[22] O.G.Raimi and C.P Kanu. *African .J.Biochemistry Research*, **2010**, 4(10): 243-245
[23] P.I Agi and A. Ebenezer. *Nig. J. ApplSci Environ manage*, **2009**, 13,1, 15-19
[24] E.C Amadi and A. *Nig. J. Parasitol*, **2008**, 20, 2, 131-135
[25] M.Plebanski and A.V. Hill. *Current Opin.immunol*.**2000**, 12,4,.437-441
[26] B.M.Alnongzhol, J.F. Robert, M. Simon, T. Bruce, W.F. Diane, F.G.L.Rose. *Am. J. Trop Med. Hyg*. **2002**,67, 6, 566-570.
[27]I.A. McGregor. *Trans Roy. Soc. Trop Med. Hyg* , **2002**,77, 232-244
[28] P.Perlmann. and M.Troye-Blomberg, *Perimann P aud Troye-Blomberg M (Edn) Basel, Krager*, **2000**, 80, 229-242.
.