

## Prevalence of Malaria Infection among Pregnant Women Attending Antenatal Clinics in Gombe State

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### Abstract

Malaria during pregnancy continues to be a major health problem in endemic countries with clinical consequences including death of both mother and child. Statistics shows that 300,000 life's especially those of children and pregnant women are lost annually to malaria. This study was aimed at assessing the prevalence of malaria among pregnant women living in Gombe Metropolis characterized by seasonal transmission of malaria. 1000 pregnant women attending antenatal clinic at Federal University Teaching Hospital Gombe (FUTHG), and Hamdala Specialist Hospital Gombe were examined. This study was carried out from March to May 2013. Thick blood film was made and stained with Giemsa using parasitological standard procedures. The overall result shows that of the 1000 samples examined 92% (n=920) were positive and 8% (n=80) negative. The density of parasitemia reveals low density in 57% , moderate in 26% and high in 8% .Percentage infection in age group reveals that Age 18-23 had (37%), 24-28 (23.5%), 29-32 had (17.5%), 34-38 (13%) and 39 above (1%).Infection according to their gestational period reveals that 1<sup>st</sup> Trimester had 31.5%, 2<sup>nd</sup> Trimester 35.5%, and 3<sup>rd</sup> Trimester 26.0%. There was higher infection rate in the 2<sup>nd</sup> Trimester, although it was statistically not significant ( $P > 0.05$ ). Since Malaria in pregnancy deserves a special attention, this research work has provided information at the local level on the spread of malaria parasites in pregnant women as a contribution towards the achievement of the millennium development goal for the control of water and sanitation related diseases in Gombe state.

Keywords: Malaria, Prevalence, Pregnant women, Parasitemia, Density and Trimester

### Background to the Study

Malaria: is a life threatening parasitic disease transmitted by female anopheles mosquitoes (W.H.O., 2001). Malaria is the most widespread and persistent disease which affects human populations throughout the world and especially in tropical countries. It is one of the biggest health problems in sub-saharan Africa (Snow *et al*, 2005) and its contribution to morbidity and mortality among people in Africa has been a subject of academic interest (Snow *et al*, 1999). In sub-saharan Africa alone 400 million persons are at risk, and nearly all the one million deaths per annum from malaria in the world occur in this region (Snow *et al*, 1999). Malaria kills a child in every 30 sec (Alnwick, 2000). In addition, pregnant women are at immense risk of malaria due to natural immune depression in pregnancy (Fievet *et al*, 1997). Malaria in pregnancy has been reported to cause high rate of infant and maternal mortality and low-birth weight (Singh *et al*, 1999).



### Study Site

Federal University Teaching Hospital Gombe (F U T H G.) is located in federal low-cost Gombe, along Ashaka road, adjacent to the State Secretarial. It was chosen as the sampling centre simply because of the availability of the samples and basic facilities.

Hamdala Specialist Clinic Gombe is located in Tudun-WadanPantami, near Pantami Stadium, opposite police Station. Hamdala Clinic was chosen as the sampling centre because the Director is a specialist in gynecology, and attracts so many referred cases.

### Sample Collection

Random blood sample collection of 1000 blood samples were collected from pregnant women of varying age ranging from 18 to 45 years, attending the two Clinics in Gombe.

### Procedure of Sample Collection

The forearm of the patient was tight using tourniquet, to remove the vein very prominent, the arm was sterilized by using a swab. The fixed needle to the syringe with the cut edge of the needle facing upwards was gently and carefully inserted in to the ante-cubital vein and 2ml blood was withdrawn, according to the method of (Raimi and Kanu, 2010).

The tourniquet was losing simultaneously with the removal of the syringe. A dry cotton wool was used to cover the punctured site, the needle was detached and the sample transferred into the anticoagulant container (E.D.T.A), the container was labeled with the following information's age, investigation, sex, date of collection, name of the patient and the gestation period.

### Laboratory Analysis

The collected samples were brought to the laboratory for film. Standard method for making a thick blood film was used as described by Chessbrough.

### Procedure for Making a Thick Film

On a clean grease free-slide, a drop of blood sample was placed at the centre, using a spreader or applicator stick, the blood was smear in a circular form and a homogeneous film was made as recommended by WHO (Agomo *et al*, 2001). The film was not too thick or thin in which a hand of a wrist watch was seen through the film. The film was allowed to air dry on a drying rack, ready for staining.

### Procedure for Staining and Examining

A prepared thick blood film was placed on a staining rack, the slide was flooded with 3% Giemsa stain of pH 7.0 and allowed to stain for 40minutes recommended by WHO (Agomo, 2001). The slide was wash with buffer water pH of about 7.2, the back of the slide was clean using a dry cotton wool and it was allowed to air drain and dry, ready for examination. A drop of oil emersion was put at the middle of the film and it was examined under microscope using x100 objective lenses (Meenseni *et al*, 2001).

**Result**

The prevalence of malaria among pregnant women attending ante-natal care in Federal Medical Centre Gombe and Hamdala Clinic is shown in the Table 1. Among the 1000 sample examined 920 (92%) were positive while the remaining 80 (8%) were negative. The result in Table 2 shows that the density of parasitemia was low in 575 patients, moderate in 265 patient and high in 80 patients with 57.5%, 26.5% and 8% respectively.

The result in Table 3 shows that, the age group 18-23years recorded the highest prevalence rate of infection followed by age group 24-28years and the least was the age group 39-43years

In Table 4 the result shows that, high prevalence rate of malaria infection is in the second trimester.

Table 1: prevalence of malaria among 1000 examined pregnant women.

Infection	Result	Percentage (%)
Negative	80	8%
Positive	920	92%
Total	1000	100%

Table 2: Density of parasitemia in the blood samples examined.

Density	Degree	Result	Percentage (%)
Low	+	575	57.0
Moderate	++	265	26.0
High	+++	80	8.00
Total		920	92

Table 3: Prevalence of malaria infection, according to their age group

Age group	Number examined	Number infected	Percentage Examined	Percentage infected
18 - 23	395	370	39.5	37.0
24 - 28	260	235	26.0	23.5
29 - 33	205	175	20.5	17.5
34 - 38	130	130	13.0	13.0
39 - 43	10	10	1.0	1.0
Total	1000	920	100	92.0

Table 4: Prevalence of malaria infection among pregnant women according to their gestational period

Gestational age	Number of subject	Number of infected	Percentage Subject	Percentage infected
1 <sup>st</sup> Trimester	335	315	33.5	31.5
2 <sup>nd</sup> Trimester	375	345	37.5	34
3 <sup>rd</sup> Trimester	290	260	29.0	26.0
Total	1000	920	100	92.0

### Discussion

Malaria remains a major disease in tropical countries. Malaria infection during pregnancy can have advance effects on both mother and fetus, including maternal anaemia, fetal loss, premature delivery, intrauterine growth retardation and delivery of low birth weight infants (Brabin, 1998). Pregnancy appears to interfere with the immune process in malaria disease which itself alters immune reactivity (Bruce-chwatt *et al*, 1983). In highly endemic malarious area where semi-immune adults usually have substantially acquired resistance to local strains of plasmodia, the prevalence of clinical malaria is higher and its severity greater in pregnant women than non-pregnant women (Uko *et al*, 1998). This is also true in this study in which prevalence rate of 92% of malaria parasite was recorded.

The 92% prevalence rate of malaria parasite (*Plasmodium falciparum*) found among the pregnant women in this study is higher than the 70.1% reported in Calabar, Nigeria by Okafor *et al* (2012) which studied the prevalence and types of Anemia in malaria infection among pregnant women Attending Antenatal Clinic in University of Calabar Teaching Hospital and also 72% previously reported in Osogbo, Southwest, Nigeria by Adefioye *et al* (2001) who studied the prevalence of malaria parasite infection among pregnant women. This could due to high human vector contact and rainfall, although this research was conducted during pre-raining season in the period of March to May it shows that malaria transmission may not be seasonal as many authors speculate.

The parasitemia density of malaria infection among pregnant women in this research, shows 57% low level, 26% moderate and 8% higher level This could be attributed to the immune system which increases as trimester increases. Pregnant women within the age group bracket 18-23 years recorded the highest number of positive case while those of the age group 39-43 years recorded the lowest number of positive case. This result supports the existing knowledge that high prevalence at lower ages and low prevalence at higher ages is due to the existence of natural immunity to infections disease including malaria (Odoula *et al*, 1992; Rogerson *et al*, 2000; Bouyou-Akotet *et al*, 2003) which study the pregnant women acquires as the age increases. Lander *et al* (2002) however reported no significant association between malaria infection and

maternal age. Also the high prevalence rate was in accordance with the report of Marielle *et al* (2003) in pregnant women in Gabon who recorded high prevalence of infection among pregnant women under age of 20 years.

In this research women in the second trimester had the highest level of parasitemia (Table 4), this finding agree with those of Nair and Nair (1994), Menendez (1995), and Nosten *et al* (1991), who reported higher frequency of malaria parasite infection in the second and early third trimester. Women in their third trimester of pregnancy were less likely to have parasitemia than did women in an earlier stage of pregnancy, this study was in accordance with the report of Christine *et al* (2009) who study the epidemiology of malaria among pregnant women attending antenatal clinics in an area with intense and highly seasonal malaria transmission in northern Ghana.

This study illustrates high prevalence of malaria in pregnant women more common in first and second trimester. Malaria should therefore be recognized as a global priority in health care more so in pregnancy. Although presumptive malaria treatment has been recommended by WHO as a malaria control measures in endemic area (WHO, 2006), this strategy should be considered for malaria in pregnancy given the lack of available antimalarial drugs with acceptable safety profiles. This is especially critical during the first trimester and also, this finding recommend that, early registration for antenatal care and regular malaria check-up in order to identify complications early, should be encouraged.

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