



## Prevalence of Malarial Parasites in Pregnant Women Attending Aminu Kano Teaching Hospital, Kano, Nigeria

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(Received 05 Dec, 2014; Accepted 11 Dec, 2014; Published 15 Dec, 2014)

**ABSTRACT:** Malaria in pregnancy remains a major public health problem especially in sub-Saharan Africa. However, the prevalence of clinical and asymptomatic infection among antenatal client (ANC) attendees is largely unknown. This study assessed the prevalence of malarial parasitemia among pregnant women attending antenatal clinic of Aminu Kano Teaching Hospital, in relation to their age, gestation period and parity. A total of 300 blood samples of pregnant women were tested to determine the prevalence of malarial parasites using Giemsa Stain method. Out of which 184 (61.3%) were found to be positive for malarial parasite, while 116 (38.7%) were negative for MP. 54 (29.3%) of the MP positive clients are within the age group of 21-25 which recorded the highest number, while the age group 41-45 recorded the least number of 1(0.54%). 131 (71.2%) of the positive clients were primigravidae, whereas 53 (28.8%) were multigravidae. Observations showed that there is high prevalence of 93 (50.5%) positive patients in 3<sup>rd</sup> trimester, followed by 82 (44.6%) in the 2<sup>nd</sup> trimester as well as 9 (4.9%) in the 1<sup>st</sup> trimester. This was attributed to the immunosuppression resulting from changes due to pregnancy. Malarial infection is common among the ANC clients attending Aminu Kano Teaching Hospital and the infection is commonly associated with anemia. The data was subjected to chi square analysis ( $X_0^2=5.99$  for 2d.f) which shows that there is no association between the distribution of the malarial parasite and the gravidity. Intermittent Preventive Treatment (IPT) should be provided especially among primigravid, secondigravid and younger mothers.

**Keywords:** Age; Infection; Malaria; Prevalence; Pregnancy; Giemsa stain.

### INTRODUCTION

Malaria is an internationally devastating disease, producing nearly 600 million new infections and three million deaths each year. Burden of this disease falls heaviest among children below the age of five in sub-Saharan Africa and 30% of the annual mortality in the populations attributed to malaria. Malaria is a disease of tropical and sub-tropical zones and may also occur in temperate latitudes. Its dissemination diminishes with distance from the equator<sup>1</sup>. Annual estimates vary from 300-500 million clinical episodes of malaria and 1.5-2.7 million deaths worldwide, 90% of which occur in the tropical Sahara<sup>2</sup>. In areas where malaria is highly endemic protective semi-immunity against *plasmodium falciparum* is acquired during the first 10-15 years of life and the majority of malaria related morbidity and mortality happens in young children. It is transmitted by infected female anopheles mosquito. It is a disease that can be treated in just 48 hours, yet it can cause fatal complication if the diagnosis and treatments are delayed. It is re-emerging as the number one priority tropical disease of the world<sup>3</sup>. In contrast pregnant women in endemic areas are highly susceptible to malaria, and both the frequency and the severity of the diseases are higher in pregnant women<sup>4</sup>. Malaria infection during pregnancy is a major public health problem in tropical and subtropical regions throughout the world. It is both an obstetric and medical problem requiring a multidisciplinary and multidimensional solution. Pregnant women are the main adult risk group for malaria. Pregnancy increases the frequency and severity of most infectious diseases but its

effect on malaria seems worse. Several theories have been put forward to explain this increased risk, including changes to the cellular immune responses that otherwise should offer protection, and increased attractiveness of the pregnant women to mosquitoes. The former is believed to result from the increased level of circulating maternal steroids in pregnancy<sup>5</sup>. Up to 20% of pregnant women in endemic areas have asymptomatic parasitemia and a recent study showed that about 40% of these will present clinical malaria within four weeks period. Cerebral malaria, acute renal failure and severe hemolysis are complications of malaria that are rare in adults in endemic areas, but, may be seen in pregnancy<sup>6</sup>.

## MATERIAL AND METHODS

**Study site:** The study was carried out at Aminu Kano Teaching Hospital, Kano state, Nigeria. The hospital is located at the Southern part of ancient Kano city along Zaria road, 11°.97<sup>1</sup> N, 8°.5<sup>1</sup> S. It is mostly attended by low, moderate and high socio-economic group of people, and therefore, it is affordable and accessible to the most inhabitants in and even outside the State.

**Sample collection:** The finger was cleaned with spirit-moist cotton and the blood samples were collected on a clean glass slide by pricking the thumb using sharp sterile needle (lancet). Drops of blood were obtained by gentle squeezing of the thumb. The blood was then prepared into thin blood film and thick blood film and then Giemsa stain was carried out.

**Staining of Blood films with Giemsa Stain:** Prior to staining, the prepared Giemsa was diluted using buffered distilled water pH 7.21 in the ratio of 1:10<sup>7</sup>.

**Staining Thin Blood Film with Giemsa stain:** The prepared slide was dipped into methanol for fixing after which it was covered with diluted and filtered Giemsa for 1 hour. The stain was poured off and washed quickly with buffered distilled water to remove the excess stain. The slide was drained, dried and examined for the presence of parasite using oil immersion objective of microscope.

**Staining Thick Blood Film with Giemsa stain:** The slide was covered with diluted Giemsa without fixing, and was allowed to stain for one hour. The stain was poured off and washed quickly with buffered distilled water pH 7.2 to remove excess stain. The slide was drained, dried and examined for the presence of parasite using oil immersion objective microscope.

**Microscopic Examination:** A drop of immersion oil was placed on the area that is mauve (pale purple) colored on the stained thin film and another drop on thick film. They were examined systematically using X100 objective lens (i.e. oil immersion objectives).

## RESULTS AND DISCUSSION

**Overall prevalence of malarial parasites in pregnant women:** Table 1 shows the percentage distribution of MP Positive and Negative subjects. Out of 300 patients examined; 184 (61.3%) were MP Positive, while 116 (38.7%) were MP Negative. This finding was similar to what was reported in Malawi<sup>8</sup>. The prevalence of asymptomatic malaria in the present study is, however, slightly higher than what was found in South-western Cameroon, where a prevalence of 32.8% was reported<sup>9</sup>. However, it is found to be lower than those reported from Southern part of Nigeria (31.0%)<sup>10</sup>.

**Table 1: Overall prevalence of malarial parasites in pregnant women**

No. Examined	No. of MP Positive	No. of MP Negative	Prevalence (%)
300	184	116	61.33

**Prevalence of MP in relation to Age:** Table 2 represents the distribution of MP positive according to age groups of the subjects. The age group 21-25 recorded the highest number of 54 (29.3%), while the age group 41-45 recorded the least number of 1 (0.54%). This result is similar to what was found by Onyenekwe<sup>11</sup>.

**Table 2: Prevalence of MP in relation to Age**

Age (Years)	No. examined	No. of MP Positive	Prevalence (%)
15-20	45	31	18.8
21-25	92	54	29.3
26-30	75	50	27.2
31-35	52	34	18.47
36-40	24	14	7.6
41-45	12	1	0.54
Overall	300	184	100

**Distribution of MP positive according to Gravidae (number of pregnancy):** Table 3 presents the result according to gravidity. It reveals that 131 (71.2%) out of 300 subjects examined were primigravidae, while 53 (28.8%) were multigravidae. This implied that primigravidae and secundigravidae were more susceptible to malarial infection than those with higher gravidity, a finding similar to what was found by several researchers across the African continent<sup>12</sup>. Several studies in Nigerian have also reported higher malaria prevalence among primigravidae and secundigravidae. This association is attributed to the immunosuppression resulting from changes in pregnancy, which is most marked among primigravidae and secundigravidae, especially in the first 24 weeks of gestation<sup>11</sup>.

**Table 3: Distribution of MP positive according to gravidae (number of pregnancy)**

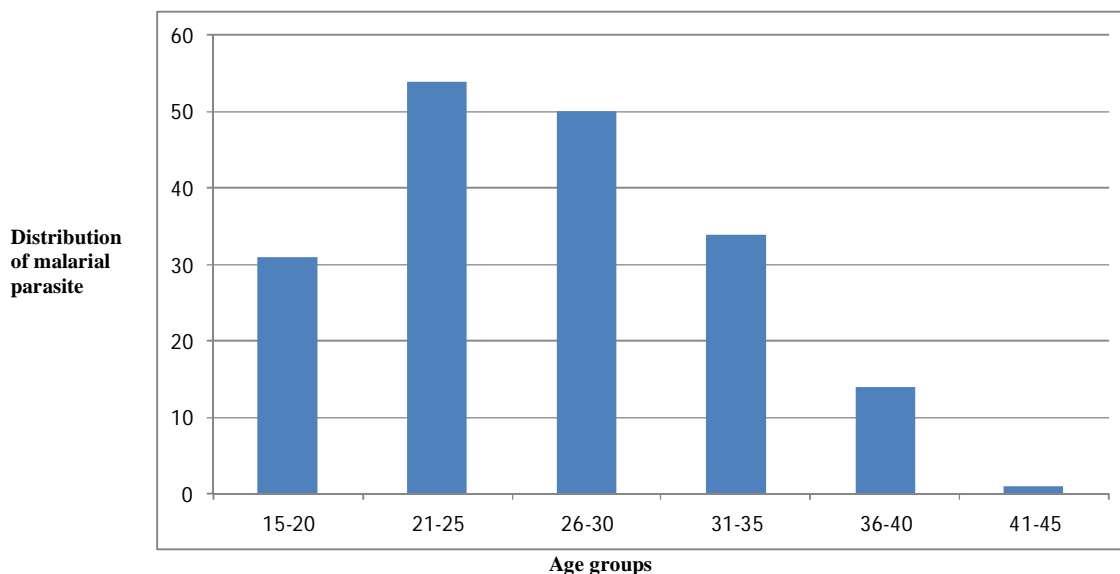
Type of Gravid	Gravid No.	Examined No. of MP	Prevalence (%)
Primigravidae	198	131	71.2
Multigravidae	102	53	28.8
Overall	300	184	100

**Distribution of MP positive in relation to gestation period (Trimester):** Table 4 shows the percentage distribution of malarial parasites in relation to gestation period (trimester). It indicates that 93 (50.54%) of the examined subjects were in third trimester which recorded the highest number. While 9 (4.89%) of the subjects were in first trimester which recorded the least number. This finding is in line with a study conducted in Ghana<sup>13 & 14</sup>.

**Table 4: Distribution of MP positive in relation to gestation period (Trimester)**

Gestation period	No. Examined	MP positive	Prevalence (%)
First trimester	15	9	4.89
Second	135	82	44.57
Third trimester	150	93	50.54
Overall	300	184	100

**Distribution of MP positive in relation to Age:** Chart below illustrates the distribution of malarial parasites positive in relation to the ages of the subjects of the study. The age group 21-25 recorded the highest number of 54 (29.3%), while age group 41-45 recorded the least number of 1 (0.54%).



**Figure 1: Chart showing the relationship between the age of pregnant women and distribution of malarial parasite**

### CONCLUSION

From this study, it can be concluded that malaria in pregnancy is still a common and serious public health problem in our environment, especially because a large proportion of the parasitemic pregnant women are asymptomatic. Malarial infection during pregnancy affects more primigravidae and secundigravidae as well as teenage mothers than those with higher gravidity and older. These research findings underscore the need for more concerted efforts at treating and preventing malaria among pregnant women, especially those in their first and second pregnancies. The intermittent preventive treatment of malaria during pregnancy, insecticide treated bed nets and effective case management are the main control strategies. Widespread implementation of effective programs remains a considerable challenge. Many women in developing countries, particularly those living in remote areas, have limited access to health care.

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