

EVALUATION OF MALARIA INFECTION ACCORDING TO GESTATIONAL AGE OF WOMEN BY TRIMESTERS.

Esimai Bessie Nonyelum^{*1}, Obeagu Emmanuel Ifeanyi² and Ikeme A.C.C.³

¹Department of Medical Laboratory Science, Evangel University Akaeze, Ebonyi State, Nigeria.

²Department of Medical Laboratory Science, Imo State University, Owerri, Nigeria.

³Department of parasitology and Entomology Faculty of Applied Natural Sciences Nnamdi Azikiwe University Awka, Anambra State, Nigeria.

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*Corresponding author: Esimai Bessie Nonyelum

Department of Medical Laboratory Science, Evangel University Akaeze, Ebonyi State, Nigeria.

ABSTRACT

Prevalence by gestational age in pregnant women showed 27 (9.6%) in first trimester, 33(25.4%) in second trimester, 80(20.5%) in third trimester. Eight hundred pregnant women of the study population and residents of Enugu who attended antenatal clinics of University of Nigeria Teaching Hospital Enugu (UNTH) and Mother of Christ Hospital both in Enugu Metropolis were assessed parasitologically to determine the presence of Plasmodium infections. The prevalence of malaria was highest in second trimester (25.4%) followed third trimester (20.5%) and low prevalence in first trimester (9.6%). It showed the immunity was stronger in first trimester, and declined abruptly in second trimester which improved little in third trimester. The gestational age of pregnant women should be considered during antenatal visits to hospitals.

INTRODUCTION

Four parasitic protozoa of the genus plasmodium (P) which include *P. ovale*, *P. vivax*, *P. malariae* and *P. falciparum* cause human malaria. *Plasmodium falciparum* cause the most severe morbidity and mortality, are found throughout tropical Africa, Asia and Latin America (Nwoke *et al.*, 1993). All the four species are transmitted to man through the bite of an infected female. *Anopheles* mosquito species of *gambiae complex*, *funestus* and *darling* (Okoro, 1993). Other less common routes of infection are through blood transfusion and Maternal-fetal transmission. Malaria remains an enormous international medical issue, being one of the commonest, oldest and extensively researched tropical diseases of our time, with high morbidity and mortality rates. Globally, 300 - 500 million deaths occur annually. Ninety percent of deaths each year come from rural Sub Saharan African (Fernandez and Bobb, 2001). All age are affected. Malaria contributes to maternal deaths. Complications of malaria include cerebral malaria, pulmonary oedema, rapidly developing anemia, vascular obstruction. Black -water fever, hyperpyrexia, algid malaria, severe gastroenteritis, nephritic syndrome, tropical splenomegaly and low birth weight in babies whose mothers have heavy malaria parasitization of the placenta (Ekanem, 1991). Malaria infection is a major cause of high mortality and

morbidity rates in pregnant which affect the outcomes of pregnancy.

MATERIALS AND METHODS

Study Area

The study was carried out in Enugu, the capital of Enugu State.

Study Population

Study population comprised of pregnant women attending antenatal clinics in Enugu Metropolis.

Sample population

Eight hundred pregnant women of the study population and residents of Enugu, who attended antenatal clinics of University of Nigeria Teaching Hospital (UNTH) and mother of Christ Hospital both in Enugu metropolis were, assessed parasitologically to determine the prevalence of plasmodium infections.

Sample collection

Permissions were requested from the doctors, nurses, health workers and medical laboratory scientists in the health-facilities to carry out the study. The consent of the patients was also solicited most collections were carried out at the laboratory section of the hospital. Study areas

were visited repeatedly on regular basis for collection of samples.

Constraints were mostly on transportation due to increase in fuel pump price and fuel scarcities. It involved hiring of taxis, joining buses for intra-city movements, and sometimes it led to trekking. With heavy down pours experienced during the rainy seasons, collections of sample were carried out most judiciously and with great commitments.

Laboratory Investigation

With sterile lancet, blood was collected from the ball of the third finger expressing the first drop of blood after cleaning with 70% alcohol. Thick and thin films were prepared and stained with 10% Giemsa solution for microscopical examination (Field, 1973). The presence of parasites and species were identified.

Adequate records were maintained for data analysis. Patient’s name, number, age, address, location of sample collection, period of season collected, date and result were noted. Data entry, coding and tabulation were carried out, using computer to maintain adequate record for each sample tested.

METHODOLOGY

Eight hundred pregnant women of the study population and residents of Enugu, who attended antenatal clinics of University of Nigeria Teaching Hospital (UNTH) and mother of Christ Hospital both in Enugu metropolis were, assessed parasitologically to determine the prevalence of plasmodium infections. The women were confirmed pregnant by the doctor either through the last menstrual periods or by early ultrasound scans. In fact their gestational age was established by the doctor.

The gravid women were recruited at various times of the study. The women on registration presented with nausea, weakness, vomiting, pyrexia and some with general debility, most of which mimicked malarial symptoms. The women were tested for the presence of malarial parasites as in the former.

Parasitology Procedure

Thick films were made and stained with 10% Giemsa solution in buffered distilled or deionized water, pH 7.2 for 5-10 minutes.

Gently, the stain was flushed off to avoid deposit of scum over the film. Parasites count on thick film was based on the number of parasites per ml of blood or per 200 white blood cells. These were counted in relation to a predetermined number of leukocytes. An average of 8,000 Leukocytes per ml was taken as standard, despite inaccuracies due to variation in the number of leukocytes in animal model, in normal health, and greater variation in ill-health. The equivalent of 0.025ml of blood (25 per microlitre) about 100 fields and using x 7 ocular, 10 = small, X100 oil immersion objective, the number of parasites were determined. The parasite per ml or parasitaemia was noted by simple mathematical formula (WHO, 1983).

$$\frac{\text{No. of parasite counted} \times 8,000}{\text{No. of Leukocytes counted}}$$

RESULTS

Prevalence according to gestational age of the women by Trimesters recorded 27(9.6%) in first trimester (Table 1). Of all the pregnant women examined, a prevalence of 19 (24.1%) was recorded in adolescent pregnancy, while 121 (16.8) recorded in adult pregnancy.

Table 1: Infection according to gestational age of the women by trimesters.

Gestational Age by Trimester	No of Pregnant Women Examined	No. of Pregnant Women	Percent positive by Trimester Examined
1-3 months (4-12 weeks) 1st Trimester	280	27	9.6%
4-6 months (16-24 weeks) 2nd Trimester	130	33	25.4%
7-9 months (28-36 weeks) 3rd Trimester	390	80	20.5%
Total	800	140	17.5%

DISCUSSION

The study showed that malaria is a worrisome disease as the infection was recorded all year round. A high prevalence of 67.9% was recorded to coincide with the rainy season, confirming the work done by Okoyeh et al. (1994) that the peak transmission in the tropics coincided with the rainy season May –October. The study revealed

that other ailments can manifest or precipitate signs and symptoms of malarial infection, since not all the patients who presented with clinical symptoms of malaria were positive to the infection. Therefore, proper investigation of should not be overemphasized.

Plasmodium falciparum was found quite predominant in the study population. P. falciparum is known to cause a

much more dangerous disease than the other species. It was recorder to be responsible for 90% of all malarial infections in Africa, most especially in rural sub-sabaran Africa (Fernanda and Bobb, 2001). It was noted as a cause to majority of deaths worldwide (Awa, 1991). *P. malariae* was found less common in the study population.

The low prevalence of infection in pregnant women of the study group revealed great awareness of disease prevention through prophylactic measures. There was high prevalence of infections in gravid women of the second and third trimesters which may indicate susceptibility of infections. Most of these women were recruited late for the antenatal clinic and had no prophylaxis. Most of them were multigravid women who decided to have a very short period of antenatal care before delivery. There was a low prevalence of infection in the first trimester which included mostly the adolescent pregnancy. They had early antenatal care and were less exposed to the infection. The work confirmed the study carried out by Silver, (1997) on susceptibility of malarial infections on pregnant women of the second and third trimesters.

CONCLUSION

The prevalence of malaria was highest in second trimester (25.4%) followed third trimester (20.5%) and low prevalence in first trimester (9.6%). This shows the immunity was stronger in first trimester and declines abruptly in second trimester which improves little in third trimester. The gestational age of pregnant women should be considered during antenatal visits to hospitals.

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