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Research Article

Prevalence of *Plasmodium* Infection among Pregnant Women in Different Hospitals in Enugu Metropolis

Esimai Bessie Nonyelum[1], Obeagu Emmanuel Ifeanyi[2]* and Njoki OO[3]

[1]*Department of Medical Laboratory Science, Evangel University Akaeze, Ebonyi State, Nigeria*

[2]*Department of Medical Laboratory Science, Imo State University, Owerri, Nigeria*

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

***Corresponding Author:** Obeagu Emmanuel Ifeanyi, Department of Medical Laboratory Science, Imo State University, Owerri, Nigeria.

Received: June 19, 2020; **Published:** July 08, 2020

Abstract

A parasitologic evaluation of blood samples of 800 pregnant women attended antenatal clinics in Enugu Metropolis in some health facilities was conducted to determine the prevalence of prevalence of *Plasmodium* (P) species with special reference to pregnant women. A prevalence of 880 (88.0%) was recorded in males and 340 (34.0%) in females. The prevalence of malaria infection among pregnant women in the hospitals selected showed 10 percent in antenatal University of Nigeria Teaching Hospital, Enugu and 25 percent in antenatal clinics, Mother of Christ Hospital Enugu. The prevalence among the pregnant women is worrisome as this can cause miscarriage in the pregnancy and premature delivery of the babies and leading to increase maternal and child mortality rates.

Keywords: *Prevalence; Plasmodium Infection; Pregnant Women; Enugu Metropolis*

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 [1]. All life four species are transmitted to man through the bite of an infected female. *Anopheles* mosquito species of gambiae complex, funestus and darling [2]. 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 [3]. 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 [4].

There is increasing resistance of parasite species to some of the existing drugs [5]. Drug resistance stresses the loss of response of parasite to the effect of the active compound. Then, effectiveness of the drug on the parasite depends on the parasitaemia and the status of the host's immunity. Moreover, it is conceivable that some nutritional and other factors in the host play an important part in the response of the parasite to the drug [6]. Stress condition enhances relapse of latent inhibited malaria parasites in the state of depressed immune

system or by a failing off in immunity brought on by physiological shocks as in exhaustion, childbirth, operations and many other conditions [7]. There is evidence from animal studies that marked vitamin A deficiency increases the severity of malaria [8,9].

In fact, the management of malaria infection become a major challenge to public health especially with the emergence of chloroquine resistant *Plasmodium falciparum* (CRPF) malaria [10,11].

Aim of the Study

The study aimed at determining the prevalence of malaria infection among pregnant women attending antennal care in different hospitals in Enugu Metropolis.

Materials and Methods

Study area

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

Study population

Study population comprised of all the inhabitants of Enugu metropolis who attended the five major hospitals and three health centres. The Hospitals included National Orthopaedic Hospital (N.O.H), University of Nigeria Teaching Hospital (UNTH), mother of Christ Hospital, Park-lane Hospital and Colliery Hospital merged with the Health Centres were used as one hospital collection centre for adequate collection of sample. Health Centres used, included Obodonike Emene Health Centre, Ugbohe Health Centre Abakpa Nike, and Obagu Amuam Ugwuaji Health Centre.

Sample population

Samples were taken from 800 pregnant women attended antenatal clinics in Enugu Metropolis in some health facilities was conducted to determine the prevalence of prevalence of *Plasmodium* (P) species with special reference to pregnant women.

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, sex, 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 parasitological 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.

Parasitologic 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 0.025 ml of blood (25 per microlitre) about 100 fields and using x 7 occular and X 100 oil immersion objective, the number of parasites were determined. The parasite per ml or parasitaemia was noted by simple mathematical formula [12]:

$$\frac{\text{No. of parasite counted x 8.-000}}{\text{No. of Leukocytes counted}}$$

Results

Sample collection centre	No examined	No positive	Percent positive from total examined (%)
Antenatal clinics, University of Nigeria Teaching Hospital (UNTH) Enugu	400	40	10
Antenatal clinics, Mother of Christ Hospital Enugu	400	100	25
Total	800	140	17.5

Table 1: *Prevalence of Plasmodium infection among pregnant women.*

Discussion

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-saharan Africa [3]. It was noted as a cause to majority of deaths worldwide [13,14]. *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 were 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. ACE enhanced mostly the effectiveness of treatment, then the management with each antioxidant vitamin.

Conclusion

The prevalence of malaria infection among pregnant women in the hospitals selected showed 10 percent in antenatal University of Nigeria Teaching Hospital, Enugu and 25 percent in antenatal clinics, Mother of Christ Hospital Enugu. The prevalence among the pregnant women is worrisome as this can cause miscarriage in the pregnancy and premature delivery of the babies and leading to increase maternal and child mortality rates.

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Volume 9 Issue 8 August 2020