wjpmr, 2020,6(7), 67-69

SJIF Impact Factor: 5.922

WORLD JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.wjpmr.com

Research Article

ISSN 2455-3301

WJPMR

PREVALENCE OF *PLASMODIUM* INFECTION IN HUMANS PRESENTING WITH SYMPTOMS OF MALARIA IN SOME HEALTH FACILITIES IN ENUGU METROPOLIS

Esimai Bessie Nonyelum*[1] and Obeagu Emmanuel Ifeanyi[2]

[1]Department of Medical Laboratory Science, Evangel University Akaeze, Ebonyi State, Nigeria.
[2]Department of Medical Laboratory Science, Imo State University, Owerri, Nigeria.

***Corresponding Author: Esimai Bessie Nonyelum**

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

Article Received on 06/05/2020 **Article Revised on 27/05/2020** **Article Accepted on 17/06/2020**

ABSTRACT

A parasitological evaluation of blood samples of 2000 symptomatic malaria patients (1000 males and 1000 females) in some health facilities of Enugu metropolis was conducted to determine the prevalence of *Plasmodium* (P) species. *Plasmodium* species encountered in patients showed significant difference (P<0.05) in the distribution *P. malariae P. falcparum.* A prevalence of 880 (88.0 percent) was recorded in males and 340 (34.0--percent) in females.

KEYWORDS: Prevalence, *Plasmodium* infection, humans, health facilities in Enugu Metropolis.

INTRODUCTION

Plasmodium falciparum causes the most severe morbidity and mortality, are found throughout tropical Africa, Asia and Latin America (Nwoke *et al.*, 1993). All life 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 ages are affected. Malaria contributes to maternal deaths. Complications of malaria include cerebral malaria, pulmonary oedema, rapidly developing anaemia, vascular obstruction. Black –water fever, hyperpyrexia, algid malaria, severe gastroenteritis, nephritic sydrome, tropical splenomegaly and low birth weight in babies whose mothers have heavy malaria parasitization of the placenta (Ekanem, 199I), There is increasing resistance of parasite species to some of the existing drugs (Barat and Bloland, I997). 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 (WHO, 1965). 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 (Broun, 1969).

Infact, the management of malaria infection becomes a major challenge to public health especially with the emergence of chloroquine resistant *plasmodium* faciparum (CRPF) malaria (Umotong *et al.*, 1991; Esimai and Njioku, 1994).

The aim of the study was to determine the prevalence of *plasmodium* species in humans presenting with malaria symptoms in Enugu Metropoils

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 Qrthopaedic 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 Obegu Amuam Ugwuaji Health Centre.

Sample population
Samples were taken from 2000 patients of both children, adults, males, females and pregnant women. They comprised of 1000 males and females with age-range, 0-60 years. Four hundred samples were collated from each hospital location.

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 simples.

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, 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.

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 laukocytes 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 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 (WHO, 1983).

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

RESULTS

Table 1: Prevalence of *plasmodium* Infection in Humans presenting with symptoms of malaria in some health facilities in Enugu Metropolis.

Location Hospital clinics and Health centres	No Examined	No positive	Percent infection from total examined
National Orthopaedic Hospital (N.O.H) Enugu	400	336	84.0
University of Nigeria Teaching Hospital (U.N.T.H) Antenatal clinics Enugu	400	40	10.0
Mother of Christ Hospital Antenatal clinic Enugu	400	100	25.0
Park-line Hospital Enugu Colliery Hospital Enugu/Obodonike Emene	400	400	86.0
health Centre, Ugbohe Health Centre Abakpa –Nike and Obegu Amunzam Ugwuaji Health-Centre	400	344	100.0
Total population	**2000**	**1220**	**61.0**

Table 2: Frequency of clinical symptoms of *Plasmodium* infection in positive patients.

Symptom in positive patient	Frequency	% frequency in positive patient
Fever	1220	100
Headache	1200	98.4
Weakness	1100	90.2
Dizziness	1096	89.8
Joint pain	1064	87.2
Loss of appetite	1020	83.6
Nausea	1018	83.4
Diarrhea	998	81.8
Vomiting	860	70.5
Cough	604	49.5

DISCUSSION

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 the blood 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.

CONCLUSION

There is a need for urgent treatment of malaria as an underlying ailment in patients from endemic regions because of the prevalence of the positive patients. The prevalence of *Plasmodium* infection and continual spread of chloroquine resistant strains should necessitate taking a step into orthomolecular approach with free-radical concept for the management of *Plasmodium* infection.

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