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EVALUATION OF MEAN PARASITE DENSITY IN THICK BLOOD FILMS OF MALARIA POSITIVE PATIENTS IN ENUGU METROPOLIS

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ABSTRACT

A parasitologic evaluation of blood samples of 2000 symptomatic malaria patients (1000 males and 1000 females) was conducted in some health facilities of Enugu metropolis. The parasite density for the study showed 192/µl for 80 positive cases and 520/µl for 1,140 malaria positive samples. This shows the impact of malaria pasrasite in the blood of the patients which is disaterous which was disastrous in the lives of the populace. More control measures and health education should be advocated to enlighten people on the control measure against malaria infection to improve the lives of many as malaria is highly endemic in this part of the world.

INTRODUCTION

Four parasitic protozoa of the genus *Plasmodium* (P) which include *P*. ovole. *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, cf. 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 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).There is evidence from animal studies that marked vitamin A deficiency increases The severity of malaria (Krishnan, 1976 and Stoltzfus, et al 1989).

The study was done to evaluate mean parasite density in thick blood films of malaria positive patients in Enugu Metropolis

MATERIALS AND METHODS

Study Area

The study was carried out in Enugu, the capital of Enugu State. Enugu has a population density of about 6958 persons per square kilometer according to National population commission 2001. The city has networks of roads and an airport at Emene and is occupied mostly by Government workers, and the inhabitants are mostly farmers and traders. The temperature is between 20 and 32 degree centigrade with a relative humidity of about 82 percent. Annual rainfall varies between 282 and 326mm.

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.

METHODOLOGY

Between March 2000 and June 2002, a paraitologic evaluation of blood sample collected from 2000 patients (1000 males and 1000 females) presenting with clinical malarial symptoms was carried out to determine the presence of *Plasmodium* infections on patients who a tended the target health facilities. All ages whose request forms indicated by the doctor, 'examination for malaria', were sampled. Examinations were conducted for 14 months of dry and rainy seasons each.

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: Mean Parasite Density in thick blood films of positive Patients.

Parasite Count	No positive	Total Parasite Count	Mean Parasite Count	Mean Parasite Density per Microlitre (UL)
Per 50 leukocytes	80	960	12	192
Per200 leukocytes	1140	14820	13	520

Simple Mathematical formula

$$\frac{\text{No. of Parasite x 800}}{\text{No. of leukocytes}} = \text{No. of parasites per ul}$$

If 500 leukocytes are counted, the no. parasites counted is multiplied by 16, and If 200 leukocytes are counted, the no of parasite counted is multiplied by 40.

DISCUSSION

lasmodium 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.

With the emergence of Chloroquine Resistant *Plasmodium* falciparum (CRPF) malaria, treatment has become a very big public health problem. T

CONCLUSION

The parasite density for the study showed 192/µl for 80 positive cases and 520/µl for 1,140 malaria positive samples. This showed the impact of malaria pasrasite in the blood of the patients which was disastrous to the lives of the populace. More control measures and health education should be advocated to enlighten people on the control measure against malaria infection to improve the

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REFERENCES

1. Nwoke, B.E.B., Nwalozie, M. C., Ogbonnaya, C. I., Aflatoxins in Human Diseases 11 (Malaria. Medicare, 1993; 5(9): 7-9.
2. Okoro, B. A., Malaria: An update on its changing patterns. Medicare, 1993; 5(9): 3-7.
3. Barat, L.M., Blolamd, P.B., Drug resistance among malaria and other parasites. Infect. Dis Clin. North Ani, 1997; 11(4): 969-87.
4. Ekanem, O.J., Malaria in Nigeria. Epidemiology and control. Nigeria Bulletin of Epidemolo, 1991; 1(3): 4-19.
5. Brown, I.N., Immunological aspects of malaria infections. Advances in Immunology, 1969; 11: 267-349.
6. Ekpechi, O., Okaro, A.N., A pattern of pruritus due to chloroquine, Archives of Dermatology, 1964; 89: 631-632.
7. Fernadez, M. C., Bobb, B.S., Medicine/Infectious Diseases. Journal, 2001; 2: 7.
8. Krishnan, S., Krishman, A. *D.*, Mastafa, A, S., Talwar, G. P., Rainalingaswami, V., Effect of vitamin A and under-nutrition on the susceptibility of rodents to a malarial parasite *Plasmodium berghei*.- *Journal of Nutrition,* 1976; *106;* 784 -79.
9. Stolitzfus, R. I., Jala F., Harvey, P. W., Nesheim, M. C., Interactions between vitamin A deficiency and *Plasmodium* berghei. Journal of Nutrition, 1989; 106: 784 – 781.
10. World Health Organization., Resistance of Malaria Parasites to Drugs, *World Health Organization Geneva*, 1965; *296: 3* - 28.
11. World Health Organization Release *Method of Counting malaria parasite in thick film*. WHO secretariat for co-ordination of malaria training in Asia an the Pacific, 1983; *45.*