ORIGINAL ARTICLE

AFRICAN JOURNAL OF CLINICAL AND EXPERIMENTAL MICROBIOLOGY MAY 2005 ISSN 1595-689X VOL 6 NO 1
AJCEM/2004037/2515

http://www.ajol.info/journals/ajcem

PREVALENCE OF MALARIA PARASITAEMIA IN PREGNANT WOMEN ATTENDING ANTENATAL CLINIC AT JOS UNIVERSITY TEACHING HOSPITAL, NIGERIA

[1]Ikeh, E. I., [1]Akudo, S. N., [2]Uguru, V. E.

Departments of [1]Medical Microbiology and [2]Obstetrics/Gynaecology, Faculty of Medical Sciences, University of Jos

Correspondence to: Dr E. I. Ikeh

The prevalence of malaria parasitaemia in 200 pregnant women attending the antenatal clinic (ANC) of Jos University Teaching Hospital (JUTH) between April and June 2003 was determined. Geimsa-stained thick and thin blood films were examined microscopically for malaria parasites; the parasite densities were determined on the thick films. Eighteen (9%) of the women were positive for malaria parasites and only *Plasmodium falciparum* was encountered in the study. Pregnant women in the 15-20 year age group recorded the highest prevalence of 16%, closely followed by the age group 21-25 years with 15.2%. The 26-30, 31-35, 36-40 and 41-50 year age groups recorded 6.7%, 4.5%, 4.1% and 0% prevalence rates respectively. Women in their first trimester recorded 13.3% as against 10.2% and 3.8% for the second and third trimester respectively. The primigravidae had a prevalence of 12.9% as against 7.2% for multigravidae. Most of the women with malaria parasitaemia (89%) had parasite densities of less than 1000/μL of blood. The low prevalence of malaria parasitaemia in the ANC women is attributed to the regular prophylactic malaria therapy and the impacts of the health talks normally given to pregnant women during routine antenatal visits

Keywords: Malaria, pregnancy, prevalence, prophylaxis

INTRODUCTION

Malaria and pregnancy are two conditions which have an impact on one another. Globally, malarial infection during pregnancy is a major health problem, and the management is becoming increasingly difficult and controversial as multiple-drug resistance is emerging. The hormonal and immunological changes brought about by pregnancy aggravate malaria. The increased nutritional needs and the immunodepressant action of certain hormones (mainly cortisol) lead to a state of immunodepression (1, 2), which may affect the functions of T-lymphocytes (3).

Plasmodium infection is a very common occurrence in Africa and several studies have reported the relationship between malaria and pregnancy and low birth weight, anaemia, splenomegaly and congenital transmission (4, 5). Low birth weight is a major determinant of infant mortality. In endemic areas, pregnant women seem to lose their immunity against malaria parasite and are more likely to develop heavy parasitaemia towards the end of the second trimester. This is more frequent during the first and second pregnancy and rare in multigravidae (4).

Susceptibility to infection and the severity of clinical manifestations are determined by the level of immunity during pregnancy which in turn depends on the intensity and stability of malaria transmission (6). It has been reported by several researchers that primigravidae usually have a higher prevalence of malaria infection when compared to multigravidae (7-10).

There have been numerous trials of chemoprophylaxis in pregnancy in malaria holoendemic areas in an attempt to reduce the incidence of small for gestation age (SGA) infants (11-13). The choice of the

agent for treatment of malaria and prophylaxis will depend on the drug resistance pattern in an area and safety in pregnancy. In general, the preferred agent for therapy in pregnancy is chloroquine if the parasites are sensitive. For chloroquine resistant malaria, quinine combined with clindamycin is the treatment of choice in pregnancy. Other drug combinations should be considered as recommended by the CDC (14).

This study determined the prevalence of malaria parasitaemia in pregnant women in order to assess the effect of routine malaria prophylaxis given in ANC of JUTH.

SUBJECTS AND METHOD

A multi-stage sampling method was used to select 200 pregnant women attending ANC of Jos University Teaching Hospital from April to June 2003. Information with respect to age, gestational age and parity were obtained from each of the studied subjects.

Two milliliters of blood was collected from each subject by venipunctures and dispensed into EDTA bottles. Thick and thin blood films were made on the same slide, labelled and stained appropriately using Giemsa's staining method (15). The stained films were examined systematically for malaria parasites and 200 leucocytes were counted before declaring the film negative for malaria parasite. A count of both the sexual and asexual forms of the parasite was done for the estimation of parasite density (16).

RESULT

The overall prevalence of 9% for malaria parasitaemia was recorded among the pregnant women in Jos University Teaching Hospital as shown in Table 1. The prevalence in relation to age groups of the women is also shown in Table 1.

Table 1: Prevalence of malaria parasitaemia in relation to the age of women attending ANC in JUTH

Age group	No Examined	No positive	% positive
15-20	25	4	16.0
21-25	46	7	15.2
26-30	60	4	6.7
31-35	44	2	4.5
36-40	24	1	4.1
41-45	1	0	0.0
Total	**200**	**18**	**9.0**

The 15-20 year age group recorded the highest prevalence of 16%, closely followed by the age group 21-25 years with 15.2%. The 26-30, 31-35, 36-40 and 41-50 year age groups recorded 6.7%, 4.5%, 4.1% and 0% prevalence rates respectively.

Table 2: Prevalence of malaria parasitaemia in relation to gestational period of women attending ANC in JUTH

Gestation period	No examined	No positive	% positive
1st trimester	30	4	13.3
2nd trimester	117	12	10.2
3rd trimester	53	2	3.8

Table 2 shows the prevalence in relation to gestation period. Women in their first trimester recorded 13.3% as against 10.2% and 3.8% for the second and third trimester respectively. Primigravid women had a prevalence of 12.9% as against 7.2% for multigravidae (Table3).

Table 3: Prevalence of malaria parasitaemia in relation to parity of women attending ANC in JUTH

Parity	No examined	No positive	% positive
Primigravidae	62	8	12.9
Multigravidae	138	10	7.2

The prevalence in relation to malaria parasite density is shown in Table 4. Most of the women with malaria parasitaemia (89%)

had parasite densities of less than 1000/μL of blood.

Table 4: Malaria parasite densities in women with parasitaemia

Parasite density (/μL)	No positive	% positive
< 1000	16	89.0
1000-2000	1	5.5
2000-3000	0	0.0
3000-4000	1	5.5

DISCUSSION

This study has shown a relatively low prevalence of malaria parasitaemia in women attending antenatal clinic of Jos University Teaching Hospital. This low prevalence may be due to the fact that most of the pregnant women registered early for antenatal care and were immediately placed on chemoprophylaxis. They were also usually enlightened during routine antenatal visits on how to prevent the scourge of malaria during pregnancy. Most of them therefore took the prophylactic drug meticulously; and most use mosquito nets and chemical sprays, which reduced the man-vector contact.

The study also confirmed that as women get older, their resistance to malaria becomes higher due to improvement in host immunity. Women in the first trimester had the highest prevalence and this implies that pregnant women should register early for ANC, so that associated complications of malaria in pregnancy can be reduced. The primigravids had higher malaria parasitaemia than the multigravids and this is probably due to the suppressive action of hormones on cell-mediated immunity (17). Most of the patients with positive parasitaemia had low parasite density, an indication of good compliant with the prophylactic drugs. The two patients with high parasite densities had clinical malaria at the time of blood sample collection and were not yet on any antimalaria therapy.

From the result of the study, there is a good evidence to show that the effort at reducing the mortality and morbidity associated with malaria in pregnancy at JUTH is yielding good result. However, majority of these groups of women live in rural areas where access to qualitative ANC care is lacking and where man-vector contact is high. Treatment and prophylaxis for malaria in pregnancy should, as a matter of concern, be free at all levels to reduce the scourge of this disease in pregnancy.

In conclusion, malaria represents additional risk in pregnancy especially in non-immuned or partially immuned women. The disease is particularly severe in the pregnant women, and can as a result of transplacental transmission, cause congenital malaria, which is associated with high neonatal mortality. The economic burden on household resulting from illness or death of a mother is devastating and the need for prompt diagnosis and effective treatment is a high priority for this high-risk group. Unfortunately, most of the newer antimalarial drugs are contraindicated in pregnancy because of possible toxicity to the fetus or their teratogenic potentials.

REFERENCES

1. Bray RS, Anderson MJ. Falciparum malaria and pregnancy. *Trans R. Soc. Trop. Med. Hyg.* 1979; **73**: 427-431
2. Prasad RN, Virk KJ, Sholarpukar SL, *et al.* Malaria infection during pregnancy. *Trans. R. Soc. Trop. Med. Hyg.* 1990; **84**: 34
3. Riley EM, Schneider G, Sambou I, *et al.* Suppression of cell-mediated immune response to malaria antigens in pregnant Gambian women. *Am. J. Trop. Med. Hyg.* 1989; **40**: 141-144.
4. Brabin BJ. The risk and severity of malaria in pregnant women. Applied field

research in malaria reports. *Int. J. Biol. Biomed. Res.* 1991; **1**: 21-25

5. Egwunyenga AO, Ajayi JA, Nmorsi OPG, *et al.* Plasmodium/Intestinal helminth co-infections among pregnant Nigerian women. *Memoirs Do Instituto Oswaldo Cruz.* 1997; **96(8)**: 1055
6. Mutabingwa TK. Malaria in pregnancy: epidemiology, pathophysiology and control options. *Acta Tropica.* 1994; **57**: 239-254
7. Keuter M, van Eijk A, Hoogstrate M, *et al.* Comparison of Chloroquine, Pyrimethamine and Sulfadoxine, and Chloroproguanil and Dapsone as treatment for falciparum malaria in pregnant and non-pregnant women, Kakamega district, Kenya. *BMJ.* 1990; **301**: 466-470
8. Mvondo JL, James MA, Campbell CC. Malaria and pregnancy in Cameroonian women. Effect of pregnancy on *P. falciparum* parasitaemia and the response to Chloroquine. *Trop. Med. Parasitol.* 1992; **43**: 1-5
9. Bulmer JN, Rasheed FN, Francis N, *et al.* Pathological classification. *Histopathology.* 1993; **22**: 211-218
10. Meuris S, Piko BB, Eervens P, *et al.* Gestational malaria: assessment of its consequences on fetal growth. *Am. J. Trop. Med. Hyg.* 1993; **48**: 603-609
11. Greewood A, Mendez C, Todd J, *et al.* The distribution of birth weights in Gambian women who received malaria chemoprophylaxis during their first pregnancy and in control women. *Trans. R. Soc. Trop. Med. Hyg.* 1994; **88**: 681
12. Menendez C, Todd J, Alonso P, *et al.* Malaria chemoprophylaxis, infection of the placenta and birth weight in Gambian primigravidae. *J. Trop. Med. Hyg.* 1994; **97**: 244
13. Mola F, Wanganapi A. Failure of Chloroquine malaria prophylaxis in pregnancy. *Austr. NZJ. Obtsetr. Gyneacol.* 1987; **27**: 24
14. Wolfe M, Cordero J. safety of Chloroquine in chemosuppression of malaria in pregnancy. *BMJ.* 1985; **290**: 1466
15. Cheesbrough M. District Laboratory Practice in Tropical Countries, Part I. Cambridge University Press, 2000.
16 World Health Organization. Basic Laboratory Methods in Parasitology. AP 113, Geneva
17. Brabin BJ. An analysis of malaria in pregnancy in Africa. *Bulletin of WHO.* 1983; **61**:1005-1010