

Prevalence of Malaria Parasite Infection among Pregnant Women in Osogbo, Southwest, Nigeria

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Abstract: The study to determine the prevalence of malaria parasites infection among pregnant women in Osogbo was carried out in Ladoke Akintola University of Technology Teaching Hospital between April-June, 2004. Both thick and thin films were made and stained using parasitological standard procedures. Questionnaires were also distributed to ascertain their state of health before recruiting them into the study. Overall 180 (72%) of the 250 pregnant women investigated were found to have malaria infections in which the age group 36-39 years had the highest frequency rate of 88.2% with mean parasite density of 800 dl⁻¹ and the difference between the pregnant women and age groups were statistically significant (p<0.05). Illiterates had the highest mean parasite density of 740 dl⁻¹ with 54.4% prevalence rate. The use of drug was also looked into, in which local herbs had 100% sensitive to *Plasmodium falciparum* than orthodox curative drug.

Key words: Prevalence • malaria parasite • *Plasmodium falciparum* • pregnant women

INTRODUCTION

Malaria is a life threatening parasitic disease transmitted by female anopheles mosquitoes. Malaria is the most highly prevalent tropical disease, with high morbidity and mortality and high economic and social impact [1].

Malaria infection during pregnancy is a major public health problem in tropical and subtropical regions throughout the world [2]. Malaria during pregnancy has been most widely evaluated in Africa South of the Sahara where 90% of the global malaria burden occurs. The burden of malaria infection during pregnancy is caused mainly by *Plasmodium falciparum*, the most common malaria species in Africa [3, 4]. Every year at least 3 million pregnancies occur among women in malarious areas of Africa, most of whom reside in areas of relatively stable malaria transmission [5]. The symptom and complications of malaria during pregnancy differ with the intensity of malaria transmission and thus with the level of immunity the pregnant woman has acquired [3]. Pregnant women and the unborn children are vulnerable to malaria, which is a major cause of perinatal mortality, low birth weight and maternal anaemia [6].

With all the above complications associated with malaria parasites infection in mind, the prevalence of malaria infection in pregnant women of various age groups is being studied. The objective of the study is to examine malaria parasite infection in pregnant women in relation to their behaviour and social pattern of living as they affect their exposure to malaria parasite infection.

MATERIALS AND METHODS

Study subject: The study subjects consisted of 250 pregnant women who came for their ante-natal visit at Ladoke Akintola University of Technology Teaching Hospital, Osogbo between April-June, 2004. They were selected randomly without the prior knowledge of their clinical and family history. The women were of varying age ranging from 20-40 years and also of different status.

Blood collection: Careful procedures were adopted in the collection of finger-prick blood samples by swabbing the area to be sampled with 70% alcohol and allowed to dry before collection. Thick and thin blood films were made on clean slides and labelled accordingly as recommended by WHO [7].

Microscopic examination: The thin films were fixed with methanol and all films were stained with 3% Giemsa stain of pH 7.0 for 30 min as recommended by WHO [7]. Taking the number of leucocytes per microliter of blood as 6,000, parasite density of blood using the thick film was expressed as: parasite count x 6,000 divided by number of WBCs counted [7]. The thick films were used to determine the parasite densities while thin films were used to identify the parasite species and infective stages. Stained slides were examined under the light microscope using x100 objective lens (immersion oil) [8].

The consent of the patients were taken before commencing the study. A questionnaire concerning age, sex occupation, drug used, gestation period, gravidae and attitude to use of mosquito net were distributed and completed.

The statistical analysis for significance was done using chi-square and Duncan multiple range test.

RESULTS

The prevalence of malarial parasite in pregnant women according to age is shown in Table 1. Of the 250 samples examined, 180 (72%) had malaria parasite in their blood. The age group 36-39 years recorded the highest prevalence rate and mean parasite density of 88.2% and 800 parasites dl⁻¹, respectively, followed by age group 32-35 years 76% prevalence rate and 640 mean parasite density (p< 0.05).

Table 1: Prevalence of malaria parasite in pregnant women according to age

Age group (Years)	No. Examined	No. Infected	% Infected	Mean Parasite Density (MPD)
20-23	30	21	70.0	640
24-27	68	51	75.0	600
28-31	80	53	66.3	800
32-35	50	38	76.0	640
36-39	17	15	88.2	800
>=40	5	2	40.0	600
Total	250	180	72.0	800

Table 2: Distribution of Malaria Parasite according to educational status of the patients

Occupation	No. Examined	No. Infected	% Infected	Mean Parasite Density (MPD)
Educated	46	25	54.4	550
Semi-Educated	84	61	72.6	609
Illiterates	120	94	78.3	740

Table 3: Prevalence of malaria parasite in pregnant women based on drug used

Drug used	No. Examined	No. Infected	% Infected	Mean Parasite Density (MPD)
Prophylaxis	114	78	68.4	640
Malariacida	47	32	68.1	680
Indigenous drug (Herbs)	5	0	0.0	300
Take no drug	84	75	89.3	1000

Table 2 shows the distribution of malaria parasite according to educational status of the patients. The illiterates pregnant women have the highest prevalence rate of (78.3%) and mean parasite density of 740 dl⁻¹. The least prevalence rate was recorded among educated patients (54.4%) with 550 mean parasite density.

Prevalence of malaria parasite in pregnant women based on drug used is shown in Table 3. The patients who refused to take drug due to their religious belief had the highest prevalence rate of 89.3%, followed by those on prophylaxis (68.4%) while those who used to take herbs (indigenous drug) had no malaria attack.

DISCUSSION AND CONCLUSIONS

Malaria disease is dangerous especially an infection with *Plasmodium falciparum* is more hazardous during pregnancy. Pregnancy appears to interfere with the immune processes in malaria a disease which itself alters immune reactivity [9]. In highly endemic malarious area where semi-immune adults usually have substantially acquired resistance to local strains of plasmodia, the prevalence of clinical malaria is higher and its severity greater in pregnant women than non-pregnant women [10]. This is also true in this study in which prevalence rate of (72%) of malaria parasite was recorded. This was not correlated with report of Uko *et al.* [10] who recorded low prevalence rate of (6.8%). This may be due to the fact that the study was carried out during rain season of April to June. The high prevalence rate was in accordance with report of Marielle *et al.* [11] in pregnant women in Gabon and was higher in primigravidae than multigravidae; and in woman within the age group 36-39 years.

The high prevalence rate in the study area could result to maternal anaemia as reported by other workers [12-14], although the haemoglobin concentration of the enlisted pregnant women was not included in the study. In areas endemic for malaria, *Plasmodium falciparum*

infection during pregnancy increases the likelihood of maternal anaemia, abortion, still birth, prematurity, intrauterine growth retardation and low birth weight [12]. Intermittent treatment with curative anti-malaria drug should be administered at least twice during pregnancy (second and third trimesters) in order to reduce the incidence of low birth weight and anaemia [14].

It was observed that illiterates pregnant women had the highest prevalence rate in this study. This is probably because they are more exposed to malaria parasite due to bad environmental condition and their life styles. The use of herbs by some pregnant women proved 100% sensitive to *Plasmodium falciparum*, in other words, herbs is highly effective for treating malaria if government can educate those involved in the practice regarding the normal dose to be taken before getting well. Therefore, government should provide subvention for the Ministry of Health incorporating National Agency for Food and Drug Administration and Control (NAFDAC) to go into more research in local herb just to develop new and more effective drug for prevention and control, particularly in view of the rapid spread of drug resistance.

The most ultimate goal of malaria control is to prevent mortality and reduce social and economic loss by reducing morbidity through progressive improvement. Regular chemoprophylaxis, where necessary in combination with stand-by treatment should be recommended for travellers. The use of insecticide-treated nets decrease both the number of malaria cases and malaria death rates in pregnant women [3]. It is also essential to avoid stagnant pools and poor environmental condition, which encourage the breeding of mosquito. Nevertheless, much work need to be done to educate the community and the producer of indigenous drug (herbs) to strictly adhere to environmental hygiene since no single woman took herb had malaria parasite in the blood.

REFERENCES

1. World Health Organisation, 2001. WHO recommended strategies for the prevention and control of communicable disease WHO/CDLS/CPE/SMT/2001, 13: 107-110.
2. Nosten, F., F. Terkuile and L. Malankiri, 1991. Malaria in pregnancy in an area of unstable endemicity. Trans Royal Soc. Trop. Med. Hyg., 48: 154-160.
3. World Health Organisation, 1993. Implementation of the Global malaria control strategy. Report of a WHO Study Group. General: ISBN 9241208392.
4. Moluneaix, L. and C. Cramicara, 1980. Research on Epidemiology and Control of Malaria in the Sudan Savannah of West Africa. The Garth Project. WHO Geneva.
5. Brabin, B.J., 1990. Failure of Chloroquine Prophylaxis for Falciparum malaria in pregnant women in Madang, Papua New Guinea. Ann. Trop. Med. Parasitol., 46: 176-200.
6. World Health Organisation, 1991. Basic Laboratory Methods in Medical Parasitology. World Health Organization Geneva.
7. Agomo, P.U., C.A. Okonkwo, O.O. Asianya, H.I Okoh and O.J. Nebe, 2001. Comparative Evaluation of Immuno-Chromatographic Test (ICT) and Parasight ®-F for the Rapid Diagnosis of Falciparum Malaria in Nigeria. Afr. J. Clin. Exp. Microbiol., 2: 45.
8. Meeusen, E.N., R.F. Bischof and C.S. Lere, 2001. Comparative T. Cell responses during pregnancy in large animals and humans. AM. J. Reproach. Immunol., 46: 169-179.
9. Bruce-Chwatt, L.J., 1983. Shape, Movement in situation and locomotion of *Plasmodia Ookinetes*. Acta. Trop., 23: 201-222.
10. Uko, E.K., A.O. Emeribe and G.C. Ejezie 1998. Malaria Infection of the placenta and Neo-Natal Low Birth Weight in Calabar. J. Med. Lab. Sci., 7: 7-10.
11. Marielle, K.B.A., E.I.C. Denisa, M.M. Modeste, K. Eric, B.M. Pierre, M. Elie and K. Maryvome, 2003. Prevalence of *Plasmodium falciparum* Infection in Pregnant women in Gabon. Malaria J., 2: 1-17.
12. Mockenhaupt, F.P., B. Rong, M. Gunther, S. Beck, H. Till, E. Kohn, W.N. Thompson and U. Bienzle, 2000. Anaemia in Pregnant Ghanaian women: Importance of Malaria, iron deficiency and haemoglobinopathies. Trans R Soc. Trop. Med. Hyg., 94: 477-483.
13. Nair, L.S. and A.S. Nair, 1993. Effects of malaria infection on pregnancy. Ind. J. Malaria, 30: 207-214.
14. World Health Organisation, 2003. Global defense against the infectious disease threat. WHO/CDS/2003/15. 18: 178-181.