THE PREVALENCE AND INTENSITY OF MALARIA PARASITE IN CHILDREN AT JOS UNIVERSITY TEACHING HOSPITAL, NIGERIA

Ikeh, E.I.1 Peletiri I.C. Angyo, I.A.
Departments of Medical Microbiology and Paediatrics Faculty of Medical Sciences University of Jos Nigeria

Correspondence to: ***Dr E.I. Ikeh*** *Department of Medical Microbiology Faculty of Medical Sciences University of Jos P.M.B. 2084 Jos, Nigeria*

ABSTRACT

Objective:

To determine the prevalence and intensity of malaria parasitaemia in clinically diagnosed paediatric patients in Jos University Teaching Hospital, and to see if there is any correlation between the parasite density and the ages of the patients

Study Population/Methods:

Consisted of blood samples from 300 children aged between 0-14 years attending the Emergency Paediatric Unit and Paediatric Out-patient Department of the Jos University Teaching Hospital Jos, with sign/symptoms suggestive of malaria. Blood collectd aseptically in sterile containers. Thick and thin film were made using Giemsa staining technique. The stain examined under X100 objective microscope.

Results:

Revealed a parasite rate of 29.3% with P. falciparum 96.6%, P. malaria 3.4%. Eighteen percent of the study population had mean parasite densities higher than the critical value of 10,000 per microlitre. There was no difference in parasitaemia in relation to gender.

Conclusion:

The prevalence of malaria is still high in Paediatric age group 27 - 29.5%. There is the need to intensify the Roll Back Malaria programme by the Federal Government of Nigeria in order to reduce the prevalence of malaria.

Key words: Prevalence, Malaria, Children.

INTRODUCTION

Malaria presents enormous health problems in Africa and about 300 - 400 million acute attacks per year are estimated to occur world wide with about 80% of the cases and deaths in the world occurring in Tropical Africa[1]. An estimated 250 million people in Africa are carriers of malaria parasites[2]. This is chiefly because the malaria vectorial systems in Africa, South of Sahara is probably the most powerful available anywhere to human population [1]. Patwari [3] reported malaria as a major public health problem in the tropics and accounted for between 5% and 15% of deaths of children in endemic areas. More cases of malaria in the neonatal period are being reported which may be due to congenital malaria through transplacental infection, malaria acquired postnatally from mosquito bites or exchange transfusion[4-7].

Malaria is holoendemic in Nigeria with P. falciparum as the dominant strain. It is the most common cause of out-patient visits to health facilities and is consistently reported as one of the five leading causes of death[8] The problem is becoming qualitatively more difficult to manage because of the continuous intensification and spread of resistance to antimalarial drugs among the parasites coupled with the general poverty in the country, which posses a serious threat of increased severity of disease and death.

The objective of this study therefore is to determine the prevalence and intensity of malaria parasitaemia in clinically diagnosed paediatric patients at JUTH and to see if there is any correlation between the parasite density and the ages of the patients.

Materials and Methods

Study Population

The population studied consisted of 300 consecutive patients whose age ranged from zero to 14 years who presented at the Emergency paediatric Unit (EPU) and the Paediatric Out-patient Department (POPD) of Jos University Teaching Hospital, with symptoms suggestive of Malaria. The study was carried out in the months of May to July, 1998.

Parasitological Techniques

Blood was collected by pricking disinfected thumbs of the patients using sterile disposable lancets. Thick and thin blood films were made on clean grease - free slides and stained appropriately using Giemsa's staining method. The stained films were then examined microscopically using x 100 objective for the number of parasites against 100 white blood cells in a thick film using WHO[9] method.

Results

Of the 300 children sampled whose clinical condition suggested malaria infection, 88(29.3%) were positive for malaria. Ninety-six point six percent(96.6%) of the positive cases were infected with P. falciparim while 3.4% were infected with P. malariae.

The prevalence and intensity of malaria parasitaemia in relation to the ages of the patients is shown in Table 1. The 11 - 14 years age group had the highest prevalence of 38.2%, while 0 - 5 months, 6 - 11 months, 1 - 5 years and 6 - 10 years recorded 30.7%, 29.5%, 27% and 28.2% respectively. The highest mean parasite density of 83,147 per microlitre of blood was recorded in the 11 - 14 years age group. The 0 - 3 months age group had a mean parasite density of 1,493 per microlitre. Eighteen point two percent (18.2%) of the study population had parasite densities higher than the critical value of 10,000 parasites per microlitre.

Table 2 shows the prevalence in relation to the gender of the patients. There was no significant difference in degree of parasitaemia (P>0.05).

TABLE I: PREVALENCE AND INTENSITY OF MALARIA PARASITAEMIA ACCORDING TO THE AGES OF THE CHILDREN AT JUTH

Age Group	*No Examined*	No Positive	%Positive	Mean Parasite Density per Microlitre
0 - 5 months	39	12	30.8	4,413
6 - 11 months	44	13	29.5	5,387
1 - 5 years	144	39	27.1	21,800
6 - 10 years	39	11	28.2	58,160
11 - 14 years	34	13	38.2	83,147
Total 300	88	29.3%		

TABLE II: PREVALENCE OF MALARIA PARASITAEMIA IN RELATION TO THE GENDER OF THE CHILDREN AT JUTH

Age Group	MALE			FEMALE		
	No Examined	No Positive	% Positive	No Examined	No Positive	% Positive
0 - 5 months	21	7	33.3	18	5	27 8
6- 11 months	24	7	29.2	20	6	30.0
1-5 years	80	18	22.5	64	21	32.8
6-10 years	24	6	25.0	15	5	33.3
11-14 years	21	8	38.1	13	5	38.5
Total	170	46	27.1	130	42	32.3

Discussion

This study highlights the importance of combining clinical diagnosis of malaria with parasitological diagnosis, especially in the paediatric age group. Malaria parasites were found only in 29.3% of the clinically diagnosed malaria patients. Delfeni [10] in his study found out that there was a progressive increase in the level of parasitaemia with increasing temperature. Thus the level of parasitaemia or the ability to diagnose malaria microscopically depends partly on the time of blood collection and whether the patient has been inadequately treated for malaria. The predominance of the virulent P. falciparum in this study is in line with previous studies[8].

The age-specific parasite rates were highest in the 11 - 14 years old and this may be attributed to the theory of innate immunity[4]. The age-specific Parasite rates in the 0 - 5 months old was as high as 30.9%. This is contrary to the report of Afri et al [11] who reported a low malaria transmission in this age group and attributed it to passively transferred maternal antibodies. In our study, although this age group had a high prevalence of malaria, the mean parasite density is low (4,413 per microlitre). Thus confirms that the maternal antibodies still convey some protection against parasite multiplication or progression of disease and so reduces the risk of severe malaria in this category of patients. It may be necessary to screen the blood for exchange transfusion so as to reduce cases of neonatal malaria.

The parasitaemia in 0 - 11 months old infants in this study most likely represents first infection and good indicator of recent transmission of malaria. It will be seen from Table 1, that the mean parasite density increases with the ages of the patients with the 11 - 14 year age group having 83,147 per microlitre. There was no statistical difference in parasitaemia in relation to sex as malaria does depend on sex but rather on the degree of exposure and availability of infectious female Anophelines.

In conclusion, the government at all levels should see malaria as a national problem and tackle it with all seriousness by ensuring financial availability for more researches into its transmission and control. Free malaria diagnosis and treatment for all paediatric patients in government hospitals should be encouraged. Also the sale of substandard anti-malarial drugs and the polypharmacy syndrome should be discouraged by health education.

References

1. World Health Organization. Practical Chemotherapy of Malaria. Report of a WHO Scientific Group. Technical Report Series 1990 No. 805 WHO, Geneva.
2. Benzenong EH, Elom B. The World Malaria Situation and Strategies for Africa. WHO, September - October, 1991; 6 - 7
3. Patwari A. Childhood Malaria. A Perspective. Post Graduate Doctor Africa 1985; 7:338-338.
4. Quinn TC, Jacobs RF, Mertz GJ, Hook III, Ocklsey RM. Congenital Malaria. A report of four cases and review. J. Paediatrics 1982; 101. 229 - 252.
5. Picollo DA, Perlman S, Ephros M. Transfusional Acquired Plasmodium malaria infection in two premature infants. J. Paediatrics 1983; 72: 560 - 562.
6. Shulman IA, Satena S, Nelson JM, Furmanski M. Neonatal exchange transfusional malaria. J. Paediatrics 1984, 73: 330-332.
7. Sodeinde O, Dawodu AH,. Neonatal Transfusional Malaria a Growing Clinical Problem. Nigeria J. Paediatric 1985; 12: 57-60.
8. Salako A, Aderounmu A, Walker O. Chloroquine Sensitivity of Plasmodium Falciparum in Ibadan. Nigeria Correlation of in-vitro and in-vivo sensitivity. Trans Royal Society of Med. Hyg. 1981; 75-5.
9. Molyneaux Gramicara C. Research on Epidemiology and Control of Malaria in the Sudan Savanna of West Africa, 1980. The Grath Project, WHO Geneva 1980.
10. World Health Organization. Basic laboratory Method in Medical Parasitology WHO 1991.
11. Delfeni F. The Relationship Between Body Temperature and Malaria Parasitaemia in Rural Forest Areas of Western Nigeria. WHO Report, WHO MA 68. 654 Unpublished Document.
12. Afri EA, Nakano T, Binka F. Owusu-Agyei S, Asigbee J. Seasonal Characteristics of Malaria infection in under five children of a rural community in Southern Ghana. West Afr. J. Med. 1993; 12(1): 39-42.