Nigerian Journal of Pharmaceutical Research
Vol. 8 No 1 pp. 72 - 77 (September 2010)

COMPLIANCE OF A SECONDARY HEALTH FACILITY TO THE NIGERIAN ANTIMALARIAL TREATMENT POLICY

[1]* **V.U. Odili, B.C. Okupa[1], H.A Okeri[2], A.W. Udezi[1]**
[1] *Department of Clinical Pharmacy and Pharmacy Practice, Faculty of Pharmacy, University of Benin, Benin-City, Nigeria.*
[2] *Department of Pharmaceutical Chemistry, Faculty of Pharmacy, University of Benin, Benin-City, Nigeria.*
Email address of corresponding author:: vuodili@yahoo.co.uk +2348023432237

Abstract
In Nigeria, the change from chloroquine and other antimalarial monotherapy treatment to artemisinin-based combination therapy (ACT) was introduced in 2004 due to evidence-based national and international findings. This one-year retrospective study describes the level of compliance to the national antimalarial treatment policy in our health institutions using the Central Hospital, Sapele in Delta State as a case study. Records of antimalarial prescriptions as well as patient biodata were systematically collected using a data form. A total of two hundred and fifty prescriptions on case management of malaria from January to December 2005 were randomly selected such that the prescribing habit of a cross section of the clinicians was obtained. Artemisinin based combination drugs were the most frequent antimalarials prescribed, they accounted for 73(28.2%) of the total antimalarial prescription. This was closely followed by artemisinin monotherapy 66(25.4%), others were chloroquine 56(21.6%), quinine 46(17.7%), sulphadoxine/pyrimethamine (SP) 14(5.4%) and halofantrine 7(2.7%). Chloroquine and quinine were still the drugs of choice in treating malaria in pregnancy. The level of compliance of the doctors in this health facility to the national anti-malarial treatment policy was quite low and various antimalarial monotherapies including chloroquine were still being used as first line drugs for malaria treatment.

Keywords: Antimalarials, guidelines, treatment policy.

INTRODUCTION

Malaria is regarded as the world's most important parasite infection and ranking among the major health and developmental challenges for the poor countries of the world (Sachs and Malaney, 2002). The burden of disease caused by malaria and its consequences has been documented in terms of childhood mortality (Snow *et al*, 1999), anaemia (Guyatt and Snow, 2001), maternal and infant morbidity and mortality (Steketee *et al*, 2001), neurological disability (Holding and Snow, 2001), economic and social costs (Chima *et al*, 2003).

Malaria continues to be a growing health problem of global dimensions since clinical cases have reached 300 to 500 million annually (Hanne *et al*, 2002). The situation may have aggravated by reports of insecticide resistance and the spread of *Plasmodium falciparum* resistant strains (Marsh, 1998).

In Nigeria, malaria is the commonest cause of hospital attendance (about 63%) in all age groups in all parts of Nigeria and malaria is also prevalent among 48% of pregnant women (Federal Ministry of Health, 2004). In spite of available promising preventive measures such as effective vector control and environmental hygiene,

*Corresponding author
ISSN 0189-8434

chemoprophylaxis still appears to be the easiest and most readily available strategy in the fight against the scourge of malaria in endemic areas (James *et al*, 1996).

However, due to drug resistance to chloroquine and some other antimalarials, there is now an increasing acceptance that an ideal case management of malaria requires the use of combination of two or more drugs (preferably with an artemisinin derivative as one of the component drug) rather than a single antimalarial drug (World Health Organisation, 2001).

Following the World Health Organization recommendations that treatment policy for malaria be an arthemisinin based combination therapy (ACTs), the Federal Ministry of Health in Nigeria just like many countries in Africa (Kamya *et al*, 2002) updated their national malaria treatment guidelines in November 2004 after drug efficacy trials carried out in 2002 and early 2004. The artemisinin-based combination therapy (ACT) takes advantage of the rapid blood schizontocidal action of the artemisinins and the long duration of action of the partner drug to effect rapid cure with low level of recrudescence (Federal Ministry of Health, 2004, World Health Organisation, 2001). From the *in vivo* clinical and parasitological responses to various antimalarials used as single agents or as combination therapy in all the geopolitical regions of Nigeria, the national treatment policy for malaria was updated to involve the use of the artemisinin-based combination therapy (ACT) both as first- and second-line treatment for the management of malaria and also to establish an essential antimalarial drug list. Therefore, the decision to change from chloroquine and other antimalarial monotherapeutic treatments was based on both national and international overwhelming evidence as well as the need to reduce the increasing burden of antimalarial drug resistance.

The process for change of the malaria drug policy is complex due to limiting factors like high costs, limited public knowledge and awareness on the change as well as the limited availability of high quality drugs.

This study was aimed at determining the level of acceptance and implementation of the national antimalarial treatment policy in our health institutions using the Central Hospital, Sapele in Delta State as a case study.

METHODS

The study was conducted in Central hospital Sapele a secondary health care institution in Delta State of Nigeria where the Urhobos are the major inhabitants. The hospital serves neighbouring towns and villages such as Jesse, Mosogar, Oghara etc. It is a 120-bed hospital divided into different wards/departments with medical staff composed of 4 consultants, about 20 medical officers and 7 pharmacists.

A data collection form was prepared to enable a retrospective screening of prescription information from the medical records of the hospital. The following information was captured: Patient's demographics such as sex, age, pregnancy status, occupation, tribe etc. Other information included name, strength, dose, cost of antimalarials and other non antimalarial drugs prescribed for patients with malaria. A total of two hundred and fifty prescriptions on case management of malaria from January to December 2005 were randomly selected such that the prescribing habits of a cross section of the doctors were obtained.

The data collected were fed into Microsoft excel database to obtain descriptive statistics while the inferential statistics were obtained

using Instat Graph-pad software version 3.

RESULTS

Of the 250 case files reviewed 133(53.2%) were females while 117 (48.8%) were males. Among the female patients only 7(5.3%) were pregnant. The mean age of the patients was 20.4 ± 29.4years, (range 1-70).

The tribes of 119 (47.6%) patients were not indicated in their records. The Urhobo tribe was the dominant tribe amongst the remaining 52.4% patients. Other ethnicities are as reflected in Fig.1.

The average number of medicines prescribed for patients diagnosed of malaria in the hospital was 4.4 including other adjunctive drugs like antibiotics, analgesics, haematinics, and anthelminthics.

Artemisinin based combination therapy (ACT) was the most frequent antimalarial prescription pattern encountered, it accounted for 73(28.2%) of the total antimalarial prescription. This was closely followed by artemisinin only antimalarial 66(25.4%). Others were chloroquine 56(21.6%), quinine 46(17.7%), sulphadoxine/pyrimethamine (SP) 14(5.4%) and halofantrine 7(2.7%).

The frequency of prescription of other drugs is as shown in Fig. 2.

There was a significant difference in the cost of the antimalarials encountered $p < 0.05$. The most expensive antimalarials prescribed in this facility were the ACTs followed by artemisinin only derivatives and halofantrine while the cheapest antimalarial was chloroquine (Table 1).

DISCUSSION

This survey provides a useful insight into the pattern of drug treatment of malaria as well as a profile of the degree of implementation of the national antimalarial treatment policy in a secondary health facility in Nigeria.

Our study revealed that the level of compliance of the doctors in this health facility to the national anti-malarial treatment policy was quite low despite the fact that ACTs were the most frequently prescribed antimalarials (28.2%). The combinations encountered were artemisinin combined with amodiaquine, lumefantrine, sulphadoxine/pyrimethamine or mefloquine.

There was also a relatively high rate of monotherapy with artemisinin derivatives (25.4%). This is suggestive of a misunderstanding of the national antimalarial policy which stipulates artemisinins in combination with certain other antimalarials with dissimilar mechanisms of action as first and second line treatment for uncomplicated malaria and not artemisinin monotherapy

We also observed that chloroquine was still being reasonably prescribed as a first line drug for malaria in the hospital. Several studies have reported that the persistent use of chloroquine contributes to increased hospital attendance, admissions, anaemia and malaria-induced mortality (Trape, 2001, Zucker *et al*, 2003, Bjorkman and Bhattarai, 2000). The continued use of chloroquine despite the new National malarial treatment policy may be due to several factors: Firstly, there was no interim period and phased introduction of the national malaria treatment policy that recommended a change from chloroquine to alternative drugs especially the artemisinin-based combination therapies (ACTs). Secondly, the high cost of these drugs relative to the older antimalarials is a major factor militating against the use of ACTs in developing countries. In this study ACTs were found to cost more than three times the costliest

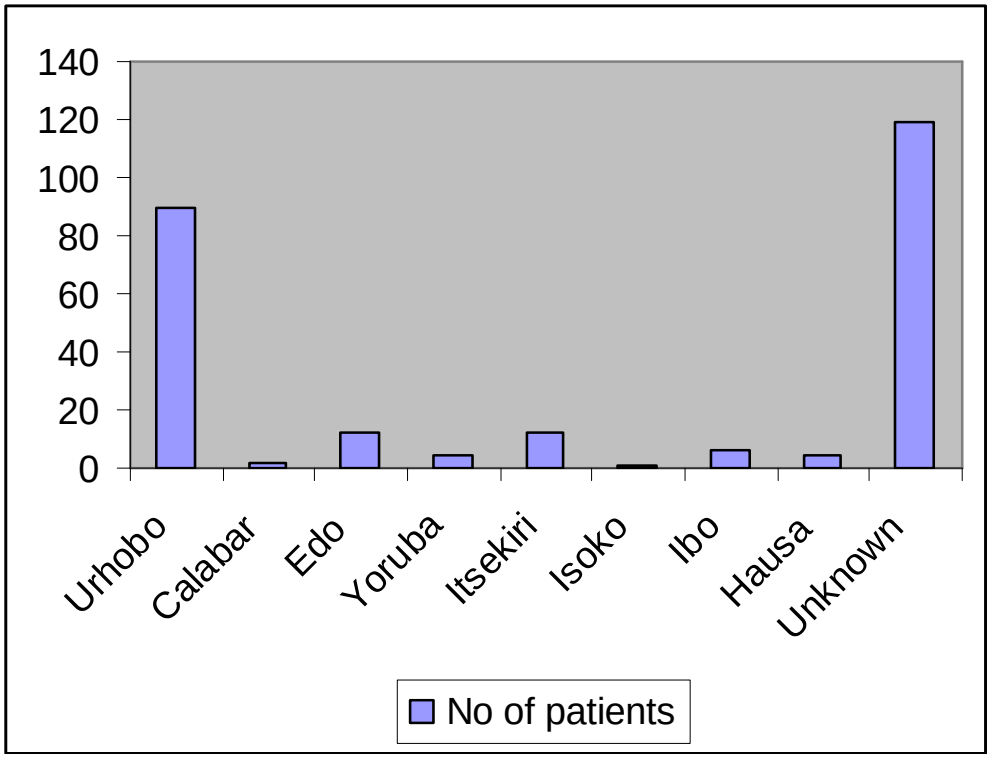

Figure 1 – Tribes of patients

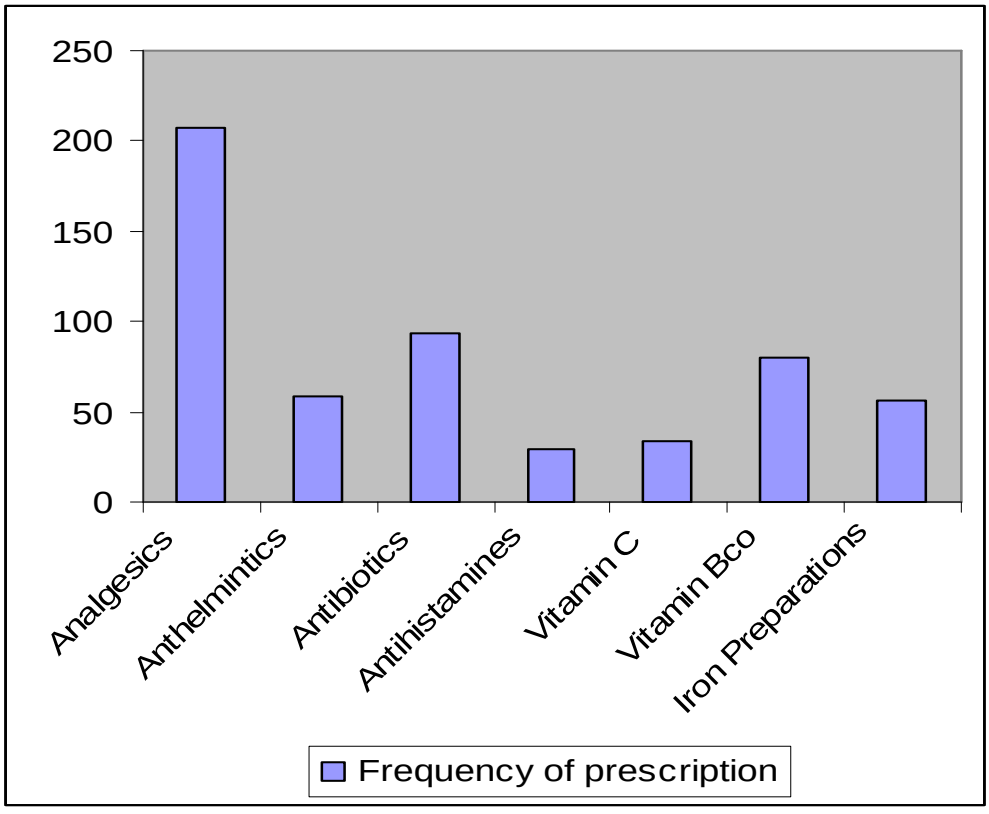

Figure 2 – Frequency of prescription of non antimalarial drugs

Table 1 - Average cost of antimalarials.

Antimalarial Drugs	Average cost of treatment (SD)	Minimum cost	Maximum cost
Chloroquine	344.82 (134.60)	50.00	600.00
Quinine	617.60 (309.8)	200.00	1250.00
Sulphadoxine/ Pyrimethamine	431.40 (294.60)	100.00	1140.00
Artemisinin (only)	927.10 (456.30)	400.00	2640.00
Artemisinin Combination Therapy (ACT)	1046.80 (372.10)	400.00	2530.00
Halofantrine	1032.90 (426.80)	320.00	1700.00

brand of chloroquine which is also widely available, and easy to use.
However, it must be noted that the cheapest antimalarial drug may not necessarily be the most cost-effective line of treatment considering the cost burden resulting from resistance in terms of both tangible and intangible costs (Phillips and Phillips, 1996).
There was no variation in the pattern of antimalarial prescription with respect to gender except for pregnant women where antimalarials prescribed were restricted to either chloroquine or quinine this is in line with the previous WHO recommendation for the case management of malaria during any trimester of pregnancy, where chloroquine (CQ) or sulphadoxine/pyrimethamine (SP) in CQ resistant areas are recommended, alternatively quinine is recommended in areas where SP is not effective (Newman *et al*, 2003). In 2002, a

WHO expert committee concluded that artemisinins could be used during second or third trimester if no suitable alternative was available (WHO, 2002) It is clear from our survey that the physicians in this health facility have concerns about the use of artemisinins in pregnancy. This may be due to animal experiments which suggest that these drugs maybe teratogenic and may cause foetal resorption in man (Clark *et al*, 2004).

CONCLUSION

The compliance with the national malaria treatment policy in this hospital under study is far from adequate. All health workers should be trained and properly oriented on the relevance and hence the need for compliance to the new national malaria treatment policy, also there should be public enlightenment campaigns on the efficacy, cost effectiveness and safety of the artemisinin-based combination therapies (ACTs).

Authors' contributions

Valentine U Odili, designed the study, Benjamin C Okupa performed the data collection: Anthony W Udezi, Valentine U Odili, Henry A Okeri, and Benjamin C Okupa analyzed, interpreted the data and made inputs on the manuscript: Henry A Okeri, Benjamin C Okupa drafted the paper. All the authors contributed to the

writing of the final paper and gave approval for publishing.

REFERENCES

Bjorkman A and Bhattarai A. (2000): Public health impact of drug resistant *Plasmodium falciparum* malaria. *Acta Trop* 2000, 594: 163 – 169.

Chima R.I., Goodman C.A. and Mills A. (2003) The economic impact of malaria in Africa: a critical review of the evidence. *Health Policy*, 63: 17 – 36.

Clark RL, White TE, S AC, Gaunt I, Winstanley P, Ward SA: (2004): Developmental toxicity of artesunate and an artesunate combination in the rat and rabbit. *B Dev Reprod Toxicol* 71**:**380-394.

Federal Ministry of Health. (2004): National Antimalarial Treatment Policy. November 2004.

Guyatt H.L. and Snow R.W. (2001): Epidemiology and burden of *Plasmodium falciparum*-related anaemia among pregnant women in sub-Saharan Africa. *Am. J. Trop. Med. Hyg.* 64: 36 – 44.

Hanne I.Z., Dan S., Jette C., Lars H., Henry H. and Jerzy W.J. (2002): *In vitro Plasmodium falciparum* sensitivity assay. *Antimicrobial agents and Chemother*. 42 (6): 1441 – 1446.

Holding P.A. and Snow R.W. (2001): Impact of *Plasmodium falciparum* malaria on performance and learning: review of the evidence. *Am. J. Trop. Med. Hyg*. 64: 68 – 75.

James W., Leslie T. and Webster J. (1996): Drug used in chemotherapy of protozoal infection. In: Goodman A., Gilman E., Hardman J.G. and Limbird L.E. (eds.). The Pharmacological Basis of Therapeutics. 9th edition. McGraw Hill Ltd. pp 965 – 980.

Kamya M.R., Bakyaita N.N., Talisuna A.O., Were W.M. and Staedke S.G. (2002): Increasing antimalarial drug resistance in Uganda and revision of the national drug policy. *Trop. Med. Int. Health*. 7: 1031 – 1041.

Marsh K. (1998): Malaria disaster in Africa. *Lancet.* 352: 924.

Newman RD, Parise ME, Slutsker L, Nahlen B, Steketee RW (2003): Safety, efficacy and determinants of effectiveness of antimalarial drugs during pregnancy: implications for prevention programmes in *Plasmodium falciparum*-endemic sub-Saharan Africa. *Trop Med Int Health* 8:488-506

Philips M and Philips-Howard PA (1996): Economic implications of resistance to antimalarial drugs. *Pharmaco-economics*. 10: 225 – 238.

Sachs J. and Malaney P. (2002): The economics and social burden of malaria. *Nature* 415: 680 – 685.

Snow R.W., Craig M., Deichmann U. and Marsh K. (1999): Estimating mortality, morbidity and disability due to malaria among Africa's non-pregnant population. World Health Organization Bull. 77: 624 – 640.

Steketee R.W., Nahlem B.L., Parise M.E. and Menedez C. (2001): The burden of malaria in pregnancy in malaria-endemic areas. *Am. J. Trop. Med. Hyg*. 64: 28 – 35.

Trape JF. (2001): The public health impact of chloroquine resistance in Africa. *Am J Trop Med Hyg*. 64: 12 – 17.

World Health Organization (2001): Antimalarial Drug Combination Therapy. Report of a WHO Technical Committee. Geneva. World Health Organization. WHO/CDS/RBM/2001.35.

World Health Organisation (2002): Assessment of the safety of artemisinin compounds in pregnancy. Report of two informal consultations convened by WHO in 2002**.** In *WHO/CDS/MAL/2003.1094 WHO/RBM/TDR/Artemisinin/03.1*. Geneva: WHO; 2003.

Zucker JR, Ruebush TK, Obonyo C, Otieno J and Campbell CC. (2003): The mortality consequences of the continued use of chloroquine in Africa: experience in Siaya, western Kenya. *Am J Trop Med Hyg.* 2003, 68: 386 – 390.