



A SURVEY OF ANTIMALARIAL DRUG USE PRACTICES AMONG URBAN DWELLERS OF ABEOKUTA IN SOUTH WEST NIGERIA

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Abstract

The manner in which anti-malarial drugs have been used has been associated with development of resistant strain and therapeutic failure. This descriptive cross-sectional study was carried out to assess anti-malarial drug-use practices among dwellers of Adigbe communities within Abeokuta environment. The study documented the knowledge, the attitude and behaviour of three hundred and fifty (350) respondents in terms of drug preference, attitude to drug use and the effects of non-compliance to anti-malarial drugs.

Structured questionnaires were used for data collection. A total of 370 questionnaires were distributed and 350 questionnaires were retrieved for analysis. One hundred and twenty five (125) (35.71) of the respondents frequently experienced malaria attack and practiced self-medication. One hundred and fifteen (115) (32.86%) of the respondents treated their malaria episode with Sulphadoxine-Pyrimethamine (SP) combination while 90 (25.71%) of the respondents frequently purchased Artesunate as monotherapy for malaria treatment due to cost-implication of the newer and available Artemisinin combination therapy (ACT's). The finding reveals that 43 (12.29%) of the respondents only purchased Artemisinin-Combination Therapy (ACTs). One hundred and eighteen (118) (33.71%) of the respondents practiced self-medication with anti-malarial drugs. The results revealed therapeutic failure to conventional use of Sulphadoxine-Pyrimethamine (SP) by the respondents as 139 (33.71%) of the respondents experienced no cure and have to repeat the treatment with anti-malarials. If drug-use pattern of anti-malarials is not monitored, there is possibility of early emergence of resistance to the highly effective anti-malarial drugs presently in use.

Keywords:

Drug use pattern, antimalarial, monotherapy, combination therapy

INTRODUCTION

Malaria remains a major public health problem in Nigeria and Africa at large. It has been estimated that out of the over one million deaths caused by malaria world-wide, 90% occur in sub-Saharan Africa (Rathod, 1997). It is a public health problem of global concern because of its high economic burden on the nation, high prevalence

(Abaaku *et al.*, 2004). Malaria is also directly responsible for 20% of childhood deaths in Africa and leading cause of mortality in Nigeria where it is holo-endemic¹. It is a tropical disease transmitted by the female *Anopheles* mosquito of which *Anopheles gambiae* is the most efficient vector.

In Nigeria, the causative agent for malaria infection is *Plasmodium*

falciparum, accounting for 98% of morbidity and mortality (Abaaku *et al.*, 2004). Both adults and children are at risk with a high incidence in children under the age of 5 years. According to the World Health Organisation report, 56% of the world population lives in malaria endemic regions and each year 300-500 million cases of malaria occur and more than one million people die of malaria (Oshikoya, 2007). The goal of therapy for malaria is to reduce morbidity and mortality in addition to encouraging rational drug use to prevent or delay the development of antimalarial drug resistance.

Malaria pharmacotherapy has been the major pharmacological means of treatment. Appropriate use of these agents and attitude of the community to pattern of drug use is important to enhance the goal of treatment and prevent emergence of resistance to therapy.

From surveys carried out, evidence shows that 80% of malaria cases are inadequately managed at community level by the home-based caregivers and 96% of caregivers initiated actions within 24 hours but only 15% of their actions are appropriate due to inadequate dosages (WHO AND UNICEF, 2005).

Drug use pattern can serve as a means to identify causes of resistance due to repeated use and the study of rational use of drugs (RUD). Whether seeking for professional help or self-treatment, both have some implications for antimalarial drug resistance. Self medication is based on presumptive treatment and this has been implicated in the development and spread of antimalarial drug resistance ((Oshikoya, 2007; WHO AND UNICEF, 2005). Knowledge of correct dosage varies and in some cases, it may be lacking. This exposes the malaria parasites to sub-optimal drug

level resulting in development of resistance.

Community-based survey is of importance because it helps to assess the pattern of antimalarial drug use and prevalence of the malaria disease in the community which determines the extent of and reason for drug use within and outside the formal health sector and the source of the drugs types and formulations available. One of the greatest health challenges of this age is that posed by malaria being a global disease. Approximately 300 million people worldwide are affected by malaria and between 1 and 1.5 million people die from it every year².

The problem of controlling malaria has become more complex over the last few years with the increase in resistance to the drugs normally used to combat the parasite that causes the disease. Pattern of drug-use in cases of malaria infection either on prescription basis or self-medication can result in high incidence of resistance strain. The knowledge and attitude of patient can influence drug-therapy. Studies in Africa have shown that the initial treatment of malaria fever often takes place at home without consulting trained professionals (Pharmanews, 2007). Although, home treatment or self-medication has the potential of positively impacting on malaria control, in terms of prompt recognition and treatment to prevent complication and reduce mortality (Rathod, 1997), the effectiveness of home treatment will depend on early recognition of symptoms and prompt commencement of appropriate treatment to ensure better outcome and prevent the progression to severe malaria.

There can be problems with antimalarial drug use, particularly where there is inadequate training of people in the use of particular drugs

resulting in emergence of resistance to these drugs. Even if drugs are obtained after consultation, the ways in which they are used depend on the understanding and health seeking behavior of individual consumer. This means that understanding of the people, their attitudes and knowledge to drug, that is, drug-taking behaviors are fundamental to attempts to improve drug usage. In averting drug-resistance problem, people need to be aware of the consequence of their drug-use patterns. Since most malaria case-management usually start and end at home, it only requires that self-treatment should be improved.

Malaria is acknowledged to be by far the most important tropical parasitic disease causing great suffering and loss of life. More than two billion people, nearly 40% of the world's population are at risk (Oboli and Harrison-Church, 1978). The high burden of the disease is associated with mortality and morbidity despite the concerted effort of the Federal Government of Nigeria and the local partners to combat the disease (Fawole and Onadeko, 2001). This has led to the development of newer drug regimen to keep the pace with the evolution of resistance acquired by malaria parasites. To improve patient's knowledge about drug-use, there is need to recognize that behavioral change can be a difficult and long process that moves along a continuum of awareness raising, knowledge acquisition, belief in ability to act and change in practice. Malaria impedes human development and thus has a social consequence and is heavy burden on economic development. Every year the nation loses over ₦132 billion from cost of treatment and absenteeism from work, school and farms (Pharmanews, 2007).

The World Health Organization (WHO) has recommended anti-malarial treatment guidelines (Pharmanews, 2007). The correct use of antimalarial drug is the key not only to therapeutic success but also to deterring the spread of drug resistance malaria⁶. Most cases of malaria are treated based on the clinical symptoms within the community and it is unavoidable that some patients will receive treatment irrationally. In order to develop rational policies concerning drug-use pattern, information must be in the perceptive of both dispensers as well as the consumers.

Since diagnosis and treatment of malaria take place at home and within community, efforts directed to improve the quality of drug-use practices are essential. Early diagnosis and prompt and correct treatment are fundamental components of the WHO strategy for malarial control (Ekanem *et al.*, 1990). This means that misconceptions likely to adversely affect control effort need to be removed and give credence to those cultural belief and practices that may contribute positively to control strategies.

Informal use of antimalarials could increase the risk of under-dosage, over-dosage or incorrect dosing, treatment failure, the resistance to antimalarial drugs, occurrence of adverse drug reaction and drug interactions which could impact negatively on antimalarial treatment safely (Dike, 2007). The objective of this study was to survey antimalarial drug use practices among Urban dwellers of Abeokuta, in Ogun State, in Southwest Nigeria, with the goals of providing and promoting pharmaceutical care.

METHODS

A descriptive cross sectional survey was carried out to assess pattern of

drug use of antimalarials among the people in the selected communities of Adigbel Area in Abeokuta. Southwest Nigeria. Structured questionnaire were used as a research instrument. A sample size of 350 respondents were drawn from different low to high socio-economic classes consisting the highly educated, lowly educated and non school educated among the population.

The study designed involved the administration of structured questionnaires to the respondents to gather information on their drug pattern. The study site was divided into four regions to aid the administration and retrieval of questionnaires. Demographics were part of the indices used for this study. Inclusion criteria were those respondents who have had malaria before and had used antimalarial drugs for treatment, age bracket of 15 years and above, and those who gave their informed consent to participate in the study and gave relevant information for the purpose the study was designed. Each respondent was given enough time to fill the questionnaire and non educated respondents were helped to fill the questionnaires based on the answers to the questions they were asked. Data retrieved were analyzed using statistical package for social science (SPSS version 10 windows). Descriptive statistics was done using tables showing frequencies and tables showing frequency and percentage distributions.

RESULTS

The highest number of patients 125 (35.7%) used antimalarials anytime they felt feverish, this was followed by 98 (28.0%) patients who used the antimalarials when recommended in the hospital. 46 (13.4%) patients used antimalarials regularly within 3

months, 30 (8.57%) patients used it once in a while, 29 (8.29%) patients used it monthly and the least 22 (6.29%) patients used it weekly.

Most patients, 118 (33.71%) used anti malaria on self recommendation, 88 (25.14%) on Pharmacists recommendation, 60 (17.14%) on Doctors' recommendation, 44 (12.57%) on Nurses recommendation and other recommendations accounted for 40 (11.43%).

One hundred and twenty one (121) (34.57%) patients had the knowledge of body pains as the symptoms of malaria, this was followed by 101 (28.86%) who had the knowledge of body temperature on the symptoms of malaria, 77 (22.0%) had the knowledge of headache as symptom, 26 (7.43%) had knowledge of loss of appetite as malaria symptom while 25 (7.14%) had the knowledge of vomiting as malaria symptom.

Majority of the patients 150 (42.85%) purchased anti malarial from pharmacy shop, this was followed by 87 (24.86%) who purchased antimalarials from hospitals, 66 (18.86%) from the Chemists, and 47 (13.43%) from friends.

Sulphadoxine/Pyrimethamine (SP) combination was frequently purchased by 115 (32.86%). This was followed by Artesunate 90 (25.71%) patients, 55 (15.71%) patients frequently purchased chloroquine, 43 (12.29%), ACTs, 26 (7.43%) Halofantrine (Halfan^R), and 21 (6.0%) Camoquine as anti malarials.

Majority of the studied population 129 (36.86%) preferred choice of anti malaria because they could afford the prize. This was followed by 60 (17.14%) patients who preferred anti malarials when recommended. 56 (1.9%), because of it once daily dosage, 42 (12.0%) because of the past experience of anti malarial usage, 40

(11.43%) because they felt better with it and 23 (6.57%) because fewer tablets are required at once.

On the perception of respondents on the effectiveness of anti malaria of their choice, 139 (39.71%) repeated anti malarials of their choice when there was no cure, 116 (33.14%) believed their anti malarials of choice worked fairly okay, 52 (14.86%) felt bad of the effectiveness of anti malarials of their choice while 43 (12.29%) felt perfectly alright with anti malarials of their choice.

DISCUSSION

Three hundred and seventy (370) questioners were distributed and 350 were returned for analysis. Table 1 shows the frequency of antimalarial use among the respondents. 125 (35.71) of respondents used antimalarial drugs often as they felt feverish which confirmed the presence of malaria parasites in the studied community with 118 (33.71%) administering antimalaria on self medication basis. (Table1)

A total of 158 respondents corresponding to 45.14% did not consult a health practitioner before using their antimalarial regimen (Table 2). Enhancing the objective of drug utilization pattern, the role of health care provider must be adequately improved in the society. Appropriate education is central to safe and effective use of drugs. The risk or harm of the development of drug resistance and irrational use of drug is less when antimalarial or other types of drugs are prescribed by an informed health practitioner (Aguwa, 1996). Their knowledge of pharmacology and physiology of the body and how drugs works in different disease states will enable them to have understanding of the appropriate antimalarial in this era or age of fast growing resistant-strain

of *P. falciparum* to the older antimalarials and enhance adequate communication or counselling to patients and drug-users (Ekanem *et al.*, 1990).

The results in Table 2 also show the sources of drugs available to the respondents. 42.85% purchased their antimalarials from pharmacy shops which ought to be a source of advantage for information. Education inform of information would be obtained from the community pharmacist but this may not always be the case.

Place of purchase could also interfere with behavioural pattern of respondents to antimalarial drug-use. Drug purchased from hawkers or market places could be detrimental to health. A total of 32.29% respondents purchased their drugs from chemists and friends. This is where the role of a pharmacist within the community setup comes in.

One of the major role of a pharmacist is to counsel and provide information to patient on the importance of avoiding irrational use of antimalarial and correct or improve behavioural pattern to drug use in form of incorrect dosing, non-compliance, use of older antimalarial in which the malaria parasite have developed resistant. Studies have revealed that the patient medicine seller's knowledge of drugs and doses is often poor (FGN, 2004). It has been discovered that in Africa, unregistered shops like patient medicine shops, drug hawkers are the main source of antimalarial drugs (FGN, 2004).

Sulphadoxine/Pyrimethamine (SP) combinations such as Amalar®, Fansidar®, Maloxine®, Ritadar® are the frequently purchased antimalarial among 115 (32.3%) respondents followed by 55 (15.71%) respondents for Chloroquine (CQ) while

Artesunate monotherapy is the most frequently purchased of the Artemisinin derivatives known to the

respondents 90 (25.71%). This monotherapy is not likely to improve cure rates of uncomplicated malaria or

Table 1 Frequency of anti-malarial drug use and who recommended antimalarial drugs by respondents

Anti-malarial Drug use	Frequency	Percentage	Valid %	Cumulative %
Once in a while	30	8.57	8.57	8.57
Anytime I feel feverish	125	35.71	35.71	44.28
Recommended in the hospital	98	28.00	28.00	72.28
Weekly	22	6.29	6.29	78.57
Monthly	29	8.29	8.29	86.86
Regularly within 3months.	46	13.14	13.14	100
Total	350	100		
Who recommended antimalarial drugs				
Doctor	60	17.14	17.14	17.14
Nurse	44	12.57	12.57	29.71
Self	118	33.71	33.71	63.42
Pharmacist	88	25.14	25.14	88.56
Others	40	11.43	11.44	100
Total	350	100		

Table 2 Knowledge of symptoms of malaria and sources of purchasing of antimalarial drugs by respondents.

Knowledge of symptoms	Frequency	Percentage	Valid %	Cumulative %
Body temperature	101	28.86	28.86	28.86
Body pains	121	34.57	34.57	63.43
Vomiting	25	7.14	7.14	70.57
Headache	77	22.00	22.00	92.57
Loss of appetite	26	7.43	7.43	100
Total	350	100		
Sources of purchase of antimalarials				
Hospital	87	24.86	24.86	24.86
Pharmacy shop	150	42.85	42.85	67.71
Chemist	66	18.86	18.86	86.57
Friends	47	13.43	13.43	100
Total	350	100		

Table 3 Profile of antimalarial drugs frequently purchased by respondents.

Anti-malarial drugs purchased	Frequency	Percentage	Valid %	Cumulative %
Chloroquine	55	15.71	15.71	15.71
Artesunate single dose	90	25.71	25.71	41.42
Sulphadoxine/pyrimethamine combination e.g. (Amalar, Fansidar etc.)	115	32.86	32.86	74.28
Camoquine	21	6.0	6.0	80.28
Halofantrin (Halfan ^R)	26	7.43	7.43	87.71
Artemisin- combination therapy (ACT) e.g. Courted, Cotexcin etc.	43	12.29	12.29	100
Total	350	100		

Table 4 Reasons for the preferred choice of anti-malarial and perception on the effectiveness of choice of antimalarial by respondents

Reason for the preferred choice of antimalarial	Frequency	Percentage	Valid %	Cumulative %
Once daily dosage	56	16.00	16.00	16.00
Fewer tablets at once	23	6.57	6.57	22.57
Feel much better with it	40	11.43	11.43	34.00
Recommended	60	17.14	17.14	51.14
Past use of drug	42	12.00	12.00	63.14
Affordable cost	129	36.86	36.86	100
Total	350	100		
Perception on the effectiveness of choice of antimalarial				
Feel bad	52	14.86	14.86	14.86
Feel perfectly alright	43	12.29	12.29	27.15
Works fairly okay	116	33.14	33.14	60.29
No cure. Repeat with another antimalarial drug	139	39.71	39.71	100
Total	350	100		

TABLE 5**Descriptive Statistics-Drug use practices by the respondents.**

	N	Mean + St. Error		Std.
Occupational Status of Respondent	4	87.50	15.63	31.257
Place of Purchasing of anti-malaria drugs	4	87.50	22.38	44.755
Who recommends anti-malaria	5	70.00	14.67	32.802
Knowledge of symptoms of malaria	5	70.00	19.46	43.509
Profile of anti-malaria drugs frequently purchased by the respondent	6	58.33	15.17	37.147
Side effects or reactions with anti-malaria drugs by the respondent	6	58.33	18.14	44.428
Knowledge of respondent on awareness and use of either single anti-malaria or combined therapy	3	116.67	44.43	76.957
Reasons for the preferred choice of anti-malaria drug use	6	58.33	15.11	37.023
Perception of respondents on the effectiveness of their choice of anti-malaria drug	4	87.50	23.64	47.276
Awareness of available anti-malaria drugs	5	70.00	8.55	19.118

reduce the speed at which resistance could develop.

Table 3 shows the profile of antimalarial drugs frequently purchased, 32.86% purchased sulphadoxine/Pyrimethamine (SP) combination. 15.71% purchased Chloroquine (CQ), 25.71% purchased Artesunate monotherapy. But it is alarming that the newest treatment guideline recommended for the treatment of malaria, the Artemisinin combination therapy (ACTs) are only being purchased by 12.29% of respondents.

The survey also reveals that despite the change in the National guidelines for treatment of malaria in Nigeria, Sulphadoxine/Pyrimethamine (32.28%) and CQ (15.71%) were still the most frequently purchased anti-malarial drugs in this community. This could be due to the cost implication of these newer antimalarial compare to the older ones. But it is alarming that resistance has been reported to these antimalarials in the six geo-political zones in Nigeria (FGN, 2005). They should not be used as first line treatment of uncomplicated malaria. It is now widely use in combination with other class of antimalarials to bring about a synergistic effect on the malaria parasites. Most malaria treatments are based on “presumptive” treatment with indication of treating uncomplicated malaria with these groups of drugs. Sulphadoxine/Pyrimethamine (SP) chemoprophylaxis is no longer in use or recommended for treatment of malaria as monotherapy because of emergence of antimalarial drug resistance and its adverse effect. (FGN, 2005). This drug resistance to older antimalarial drugs used as monotherapy is known to be the key

factor contributing to increasing rate of morbidity and mortality as a result of malaria episode (Femi-Oyewo, 1997). In response to widespread resistance to older antimalarial drugs, WHO has recommended Artemisinin Combination Therapy (ACTs) as first line therapy for the treatment of uncomplicated malaria, but it is alarming that the use of this drug is limited among the respondents as only (12.29%) of respondents indicated that they frequently purchase this combination. Artemisinin derivatives used as monotherapy is no longer encouraged as WHO in order to preserve the efficacy of artemisinins as an essential component of life-saving ACTs, has called for a ban on the use of oral artemisinin monotherapies at various levels including manufacturers, international drug suppliers, National health authorities and funding agencies involved in the funding of essential antimalarial medicine (FGN 2005; WHO and UNICEF, 2005).

Table 4 shows the factors responsible for the preferred choice of respondents antimalarial use. These factors include once daily dosage and fewer tablets at once.

The low level of awareness on the use of ACTs among the studied communities could be as a result of cost implication and level of literacy of respondents. ACTs cost up to twenty-times as much as older medications and remains unaffordable for the majority in many malaria – endemic region (Oreagba *et al.*, 2005). Reasons for the preferred choice of antimalarial among the respondents include once daily dosage, fewer tablets at once, feel much better with the drug of choice, past experience with the drug while a larger percentage indicated affordable cost of the

antimalarial (Table 4). It has been reported that people with malaria episode are often the poor and low socio-economic class who cannot afford the best treatment for malaria (Oreagba *et al.*, 2005). They often do not have the financial means to purchase such highly effective anti malarial drugs.

Table 4 also shows the effectiveness rates of the older antimalarial, majority purchased by the respondents 39.71% had no cure and have to repeat with other antimalarial drugs.

Affordability of these newly implemented combination therapies is of great concern among the studied communities. This is a major concern among the stakeholders in health sector to take adequate measure to subsidise the cost of these antimalarial drugs to be able to achieve the goals of malaria control as malaria is a burden to the nation as a whole with its high rate of morbidity and mortality.

Adequate knowledge which will influence behavioural attitude to antimalarial in terms of correct dosing, compliance factors, appropriate use of available antimalarials is crucial in averting antimalarial drug use pattern and drug resistance. Table 5 shows the perception of respondents on the effectiveness of their choice of anti-malarial drugs. Forty three (43) respondents (12.29%) felt perfectly alright with their choice of anti-malarial use while a total 139 (39.71%) respondents had therapeutic failure and had to repeat their treatments of malaria with another anti-malarial drug. Since majority of the respondents are practicing self-medication treatment with anti-malarial drugs with the less effective drugs as monotherapy, it was obvious that effectiveness rate was limited as they have to repeat the treatment with another anti-malarial drug.

The result of the 2002 Efficacy studies indicated that CQ and SP were no longer adequate for National first line – use (WHO, 2003). Low effectiveness of the older antimalarial drugs could be due to resistance of malaria parasite to the older drugs which are rapidly losing their efficacy.

CONCLUSION

Since artemisinin base combination therapy (ACTs) has been established to improve the management of malaria over all other antimalarials in the recent time, efforts should be made by health care practitioners to prescribe these drugs. Government should include in the health budget the provision by which ACTs can be made affordable by those who cannot afford them.

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