Research article

A Survey of Antimalarial Drug Use Practices among Urban Dwellers in Abeokuta, Nigeria

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ABSTRACT: Drug-use pattern of anti-malarial 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 drug. Structured questionnaires were used for data collection, as 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 eight can 118 (33.71%) of the respondents practiced self-medication with anti-malarial drug. The results revealed therapeutic failure to conventional use of Sulphadoxine-Pyrimethamine (SP) by the respondents as One hundred and thirty nine (139) (33.71%) of the respondents experienced no cure and have to repeat the treatment with anti-malarias. 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..

Key Word: *Drug use Pattern, Antimalaria, Monotherapy*

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

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et al, 1997). It is a public health problem of global concern because of its high economic burden on the nation, high prevalence of mortality in children, pregnant women and non-immune individuals (Benjamin 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-endemic (Rathod et al, 1997). It is a tropical disease transmitted by the female Anopheles mosquito of which *Anopheles gambiae* is the most efficient vector.

Mostly in Nigeria, malaria infection occurs through *Plasmodium falciparum* accounting for 98% of morbidity and mortality[2]. Both adults and children are at risk with a high incidence in children under the age of 5 years (Benjamin et al, 2004). 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 have been the major pharmacological means of prevention. 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 (W.H.O, 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 (W.H.O, 2005; Oshikoya, 2007) . 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 year (Benjamin et al, 2004).

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 et al, 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 ([6]. 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[7]. 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[5]. The correct use of antimalarial drug is the key not only to therapeutic success but also to deterring the spread of drug resistance malaria (Oboli, 1978). 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 (Fawole and Onasdeko, 2001). 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 (Ekanem et al, 1990). The objective of this study is 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.

MATERIALS AND 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 Adigbe 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 antimalaria 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 informations 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 (Table 1).

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	%	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 ect.)	115	32.86	32.86	74.28
Camoquine	21	6.0	6.0	80.28
Halofantrin (Helfan[R])	26	7.43	7.43	87.71
Artemissin-combination therapy (ACT) e.g. coartem, cotexcin etc.	43	12.29	12.29	100
Total	**350**	**100**		

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%).

Table 2 shows the respondents' knowledge of symptoms of malaria and sources of purchasing of antimalarial drugs. 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 Artensunate 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 (16,9%), 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 OK, 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.

Table 4
Reasons for the preferred choice of anti-malarial and perception on the effectiveness of choice of antimalaria 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

DISCUSSION

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 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 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 report, 2007). It has been observed that in Africa, unregistered shops like patient medicine shops, drug hawkers are the main source of antimalarial drugs

The results of this study reveal that Sulphadoxine/Pyrimethamine (SP) combinations such as Amalar®, Fansidar®, Maloxine®, Ritadar® are the frequently purchased antimalarial drugs followed Chloroquine (CQ) while Artesunate monotherapy is the most frequently purchased of the Artemisinin derivatives. This monotherapy is not likely to improve cure rates of uncomplicated malaria or reduce the speed at which resistance could develop.

The survey also reveals that despite the change in the National guidelines for treatment of malaria in Nigeria, Sulphadoxine/Pyrimethamine and CQ were 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.[18]

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[14]. 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 (WHO, 2005; FGN report, 2004).

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.

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 subsidies 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. 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.

Since artemisinin base combination therapy (ACTs) have been established to improve the management of malaria over all other antimalarias in the recent time, efforts should be made by health care

practioners 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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