

Original Research Article

Patients' adherence to antimalarial medication; self-report of patients at the Volta regional hospital of Ho, Ghana

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ABSTRACT

Background: Despite the advancement in malaria treatments and management; malaria morbidity and mortality is still on the increase. This phenomenon has been mostly attributed to the emergence and transmission resistance of the plasmodium parasite to drugs; which is as a result of non-adherence to anti-malaria medication. Therefore, the purpose of this study was to assess patients' adherence to anti-malarial medications and the factors influencing their adherence in the Volta regional hospital.

Methods: A descriptive cross-sectional study was employed. Convenience sampling technique was used in recruiting respondents. Data were collected within a period of 8 weeks from April to May 2017. Data were analyzed using descriptive statistics in the form of frequencies, percentages, mean and standard deviations which was generated by the use of IBM statistical package for social sciences version 23.

Results: The average age of respondents surveyed for this study was 32.27 ± 11.09 ranging from 19 to 68 years. Majority (51.7%) of respondents were females and 76.7% of them being Christians. The study findings revealed that 36.6% of patient were completely adherent to anti-malarial medication. Over 90% of respondents agreed that the malarial medication had bad taste and it was an unpleasant feeling for them taking it.

Conclusions: Poor adherence to antimalaria medications could play a role in the future development of drug resistance. As such, identifying ways to improve anti-malarial compliance will help mitigate drug resistance. Therefore, further studies should be carried out on ways to improve patients' adherence to antimalarial medication.

Keywords: Anti-malarial medication, Adherence, Artemisinin-based combination therapy

INTRODUCTION

Malaria is a major cause of illness and death in Ghana, particularly among children and pregnant women. In 2006, malaria accounted for 38.6% of all outpatient illnesses and 36.9% of all admissions in health facilities. Malaria prevalence per thousand populations was 171 and 2,835 malaria-attributable deaths (all ages) representing 19% of all deaths that were recorded.¹

In Ghana, as well as globally, malaria control programmes are threatened by the development of drug resistance to mono therapies necessitating revisions of treatment policies. In this regard, in 2002 Ghana initiated the process of using artemisinin-based combination therapies (ACTs) following world health organization (WHO) recommendations for all countries experiencing resistance to mono-therapies in the treatment of falciparum malaria. In 2004, Ghana changed its anti-malaria drug policy selecting Artesunate-Amodiaquine

combination as the first line drug for the management of uncomplicated malaria.¹

The development and spread of drug-resistant strains of malaria parasites has been identified as a key reason in malaria resurgence and is one of the greatest challenges to malaria control in recent times. Efforts to prevent deterioration of drug resistant malaria are, therefore, at present directed towards finding novel ways of intervening to improve adherence and prevent the irrational use of currently available multi-dose anti-malarial drugs.²

Malaria, a fatal tropical disease, which is being recognized for three millennia is still one of the leaders of life-threatening diseases.³ Despite being treatable and preventable, 108 countries are still endemic for malaria which means half the population of the world is at risk for getting malaria infection. It was calculated approximately that 91% of deaths in 2010 were in the African Region.⁴

The important causes of developments of anti-malarial drug resistance include overall drug pressure, inadequate drug intake (poor compliance or inappropriate dosing regimens), pharmacokinetic and pharmaco-dynamic properties of the drug or drug combination, drug interactions and drug quality.⁵ When patients get relief from major clinical symptoms, they may sustain with poor levels of adherence. Although the sensitive parasites are washed up, exposure of the parasite to sub-therapeutic drug levels, the remaining or recrudescing ones tend to be of the resistant type and may lead to drug failure in endemic area.^{6,7}

Recently, artemisinin resistance has been detected in four Southeast Asian countries (Cambodia, Myanmar, Thailand, and Viet Nam) and also in Equatorial Guinea, where a case report warned of the emergence of artemisinin resistance.⁸⁻¹¹ It is also reported that, in the Greater Mekong sub region (GMS), high treatment failure rates were following treatment with an ACT where there was concomitant resistance to artemisinin and the partner drug.¹²

The resistance to artemisinin has been attributed to factors such as poor patient compliance with prescribed regimens, irrational prescribing practices, improper use of artemisinin monotherapies, and inadequate access to quality assured forms of the drug.¹³⁻¹⁵ Luckily, ACTs remain effective as long as resistance to the partner drug has not developed. But while resistance to ACTs has not yet been observed, concern exists that poor treatment practices (non-adherence) may promote ACT resistance in the future, a situation similar to the global spread of chloroquine resistance that has occurred.¹⁶

Not much quantitative information on adherence to anti-malarial treatment is available in Ghana. In some countries where studies have been done, adherence to

anti-malaria medications have been reported to be poor.¹⁷⁻²⁰ According to McDonnell et al, little attention is paid to the appropriate dosage and completion of the prescribed doses.²¹ A number of studies have linked poor or non-adherence to the increased malaria related morbidity and mortality, therapeutic failure, drug resistance and misuse of the left-over drugs.²²⁻²⁵ Similarly, non-adherence has been associated with increased health care costs.^{21,25}

In Ghana, despite much effort put in place to fight malaria including the formulation of malaria treatment policies, provision of free malaria treatment and subsidized or free insecticide treated bed nets, malaria is still a major public health challenge particularly to pregnant women and children under the age of five years.^{1,26,27} Therefore, the purpose of this study was to assess patients' adherence to anti-malarial medications and the factors influencing their adherence in the Volta regional hospital.

METHODS

A descriptive cross-sectional study was employed, using a pre-tested, reliable, validated, self-administered, semi-structured questionnaire to assess patients' adherence to anti-malarial medication at the Volta regional hospital. The Volta Regional Hospital is in Ho, the capital of Ho municipality and the Volta region. The hospital is made up of a 240- bed capacity with nine wards, some of which are the female and male medical wards, female and male surgical wards, maternity ward, children's' ward and accident and emergency ward. The hospital serves as the chief referral point for the region.

The study population was all patients in VRH whereas the target population of the study included all patients admitted at the medical and surgical wards, who have for once been on malaria medication for the past one years. The average number of cases admitted in these wards for a month is 310 cases. Convenience sampling technique was employed in recruiting respondents. Respondents were recruited on daily basis from 8am to 6pm. Respondents who met the inclusion criteria and consented to be part of the study were recruited. The sample size for the survey was calculated using the formula for sample size determination by Yamane (1967) in Oyetunde, Kelechi and Oyediran as shown below.²⁸

$$n = \frac{N}{1+Ne^2} \quad n = \frac{310}{1+310(0.05)^2} \quad n=175$$

Whereby; n is required sample size. N is the total population. e is the error of tolerance (0.05).

Using an actual population of 310 cases in a month, a sample size of 175 respondents was arrived at using the sample size determination formula above. After permission was sought from the study hospital, the nurse researcher commenced with data collection. Data collection covered a period of 8 weeks, from April to

May 2017, between the hours of 8am to 6pm each day. Once the patient consented and met the inclusion criteria, they received the questionnaire. The questionnaire, consisted of patient demographic data, patients' adherence to antimalaria, factors influencing non-adherence and patient's perception about anti-malaria treatment.

An explanation of the expected length of time (approximately 15 minutes) to complete the study questionnaire was provided. The nurse researcher was present while respondents completed each questionnaire. After the respondents completed the questionnaire, they were received and placed in an envelope and sealed. Participants who could neither read nor write were assisted by the nurse researcher to complete the questionnaire. The nurse researcher placed completed instruments in the researcher's locked desk drawer for safety and confidentiality.

A pre-tested, validated and reliable semi-structured psychometric instrument was used for the study. The instrument was divided into four sections (A, B, C and D). Section A, had item that measured the demographic characteristics of the respondents, section B measured patients' adherence to malarial medication while section C measured the perception of patients on antimalarial medication and section D measured factors influencing patients' non-adherence to antimalarial medication.

Statistical analysis

Descriptive statistics in the form of frequencies, percentages, mean and standard deviations were generated by the use of Microsoft excel spread sheet and IBM statistical package for social sciences (SPSS version 23). Cross tables of frequencies and percentages of the distribution were produced with regards to the various demographics.

To ensure the questionnaire's validity and reliability, the researcher were guided by the study aim and reviewed literature in constructing and structuring of the various items in the questionnaire. Two professional pharmacists at VRH where made to review the questionnaire, and their inputs were accepted. The questionnaire was pretested in the VRH with 10 patients. The necessary corrections and reconstruction of the questionnaire were made to ensure that every part of the tool reflected the actual situation on the ground.

Permission to conduct this study was provided by the management of VRH. A research proposal was submitted to a committee formed School of Nursing and Midwifery of the University of Health and Allied Sciences, in which approval was given to conduct the study. The essence of the study was explained to each respondent and an informed consent obtained before administering the questionnaire. Respondents were able to withdraw from the study at any point in time without any penalty or loss

of benefits/care that they would normally receive. Respondents were assured of privacy and confidentiality.

RESULTS

Table 1: Demographic characteristics of respondents.

Variable	Frequency	Percentage
Age category (years)		
16-19	13	7.6
20-35	107	62.2
36-49	36	20.9
50 and above	16	9.3
Minimum=19, Maximum=68	Mean=32.27	SD=11.09
Gender		
Male	83	48.3
Female	89	51.7
Religion		
Traditional	11	6.4
Christian	132	76.7
Muslim	23	13.4
Others	6	3.5
Education		
None	6	3.5
Secondary	42	24.4
Basic	36	20.9
Tertiary	88	51.2
Ever had Malaria?		
Yes	172	100
Frequent of Malaria within the year		
1-4 times	152	88.4
5-8 times	20	11.6
Frequent of hospital attendance for malaria		
0-4 times	149	86.6
5-8 times	23	13.4
How do you get your malaria treatment?		
Herbal preparation at home	50	29.1
Buy from drug store without prescription	54	31.4
Doctor's prescription	68	39.5
Usual malaria treatment		
ACTs	96	55.8
Herbal drug	51	29.7
Herbal drugs + ACTs	25	14.5
Preferred route of administration		
Oral	90	52.3
Injectable	66	38.4
Oral + Injectable	16	9.3
When do you stop your medication (ACTs)		
First day	2	1.2
Second day	31	18.0
Third day	76	44.2
Complete dose	63	36.6
Total	172	100

Demographic characteristics of respondents

With Table 1, the average age of respondents surveyed for this study was 32.27±11.09 ranging from a minimum of 19 years to a maximum of 68 years. Eighty-nine (51.7%) of respondent were females and (76.7%) of them being Christians. Less than half (48.8%) had attained at least secondary education. All the respondents (100%) have ever had episodes of malaria with majority (88.4%) of respondents expressing that they had malaria 1-4 times within year. One hundred and forty-nine (86.6%) asserts they attend hospital at most 4 times a year for malaria. About 40% of respondents follow doctor's prescription

for malaria treatment, 31.4% had their treatment through drug stores without prescription and 29.1% by herbal preparations at home. The common treatment of malaria for majority (55.8%) of respondents were ACTs, followed by 29.7% opted for herbal treatment. Interestingly majority (52.3%) of the respondents preferred oral route for malaria treatment. Finding out when respondents usually stop malaria treatment course, a major share (44.2%) stop on the third day, 36.6% completed the treatment course, 18.0% on the second day with the least (1.2%) on the first day.

Table 2: Perception of patients on antimalarial medication.

Statements on perception	Frequency of response		
	Agree	Sometimes	Disagree
Taking malarial medication is unpleasant/have bad taste	78 (45.3)	79 (45.9)	15 (8.7)
I dislike my current malarial medication	36 (20.9)	85 (49.4)	51 (29.7)
Taking malaria treatment makes me weak	68 (39.5)	66 (38.4)	38 (22.1)
I feel that the good things about taking medication outweigh the bad	132 (76.7)	29 (16.9)	11 (6.4)
Too many tablets are involved in malarial medication	85 (49.4)	59 (34.3)	28 (16.3)
I buy some more drugs in addition to my malaria medication, since they are not potent enough for me	22 (12.8)	42 (24.4)	108 (62.8)
I use some herbal preparations in addition to my malaria medication, since they are not potent enough for me	24 (14.0)	19 (11.0)	129 (75.0)

Table 3: Reasons for non-adherence to ACTs.

Reasons for non-adherence	Responses	Frequency	Percentage
I prefer herbal preparations to acts	Agree	24	14.0
	Sometimes	32	18.6
	Disagree	116	67.4
Acts are too expensive for me to purchase	Agree	33	19.2
	Sometimes	91	52.9
	Disagree	48	27.9
I am allergic/react to acts	Agree	16	9.3
	Sometimes	39	22.7
	Disagree	117	68.0
I just don't like taking medicine	Agree	50	29.1
	Sometimes	87	50.6
	Disagree	35	20.3
The quantity of act tablets to take is too much for me	Agree	54	31.4
	Sometimes	88	51.2
	Disagree	30	17.4
I sometimes forget to take my ACTs	Agree	40	23.3
	Sometimes	74	43.0
	Disagree	58	33.7
The ACTs are not potent enough for me	Agree	18	10.5
	Sometimes	42	24.4
	Disagree	112	65.1
Total		172	100

Perception of patients on antimalarial medication

In assessing patients' perception about anti-malarial medications in Table 2, 45.9% of respondents said taking malarial medication was unpleasant. Most respondents (49.4%) agreed that they sometimes dislike their malarial medications. Also (39.5%) of respondents agreed that taking malaria treatment makes them weak, with an overwhelming 76.6% saying that they feel that the good things about taking anti-malarial medication outweigh the bad. Majority of the respondents agreed that too many tablets are involved during malarial treatment, minority of respondents (14%) agreed that they use some herbal preparations in addition to their malaria medication, since that feel the antimalarial drugs are not potent enough for them.

Factors influencing non-adherence to antimalarial medication

Table 3 below looks at the reasons for non-adherence to ACTs. From the respondents, 116 (67.4%) disagree with the preference of herbal preparations to ACTs, 91 (52.9%) postulated that sometimes ACTs are too expensive for them to purchase, 117 (68.0%) disagree that they are allergic to ACTs and 87(50.6%) sometimes just do not like taking medicine. Considering the quantity of ACT tablets and forgetfulness as a reason for non-adherence, majority (51.2% and 43.0%, respectively) posited that it sometimes affects their adherence and 112 (65.1%) disagree that ACTs are not potent enough for them.

DISCUSSION

This study documents respondents' adherence and non-adherence to anti-malarial medications, factors influencing non-adherence to antimalarial medications and their perception about antimalarial medications. In regard to adherence to antimalarial medication, majority (63.4%) of respondents self-reported of non-adherence to antimalarial medication, meaning they were not able to complete the treatment course. Minority of respondents (36.6%) were found to be completely adherent. Adherence level was measured by respondents self-reporting of completing the treatment course of antimalarial medication (ACTs).

The current study finding is in accordance with Depoortere et al, where they reported a low adherence level of 39.4% in a Zambian refugee settlement.¹⁹ The study finding is also in agreement with the findings of Amponsah et al, Gore-Langton et al, Yeung and White, where they reported low adherence level to antimalarial medications.²⁹⁻³¹ The current study finding disagrees with Aung et al, where (85.7%) of respondents in Rakhine State, Myanmar were classified as probably adherent, and 23 (14.3%) as non-adherent group.² Also, the study finding is not in accordance with Fogg et al. where they reported high adherence to the combination of

Artemether and Lumefantrine in Uganda in which 90% of the children were documented as being probably adherent, 7.1% being definitely non-adherent.³² These disparities with the current study finding and the other studies might be due to varied methodological approach used per each study conducted. Also, some of the studies were conducted using children to assess their adherence level, one can stipulate that children can be monitored by their parents to strict adherence to anti-malarial medication, thereby bring about higher adherence level. Where as in adults because of their busy schedules, most people do not adhere to antimalarial medication due to varied reasons or factors.

Interestingly, over 90% of respondents agreed that the malarial medication they took had bad taste and it was an unpleasant feeling for them taking malarial medication (ACTs). Patients with the perception that malarial medications have bad taste and unpleasant for consumption are more likely to be non-adherence to malarial medication because of the preoccupied mindset about the bad taste of anti-malaria medications. The study also found that majority of the respondents also disliked their current anti-malarial medication which they used. This is most likely to affect adherence levels drastically since people would not like to continue using drugs they dislike. Souares et al, revealed that, taste, cost and complexity were some of the most considered perspectives of patients in choosing a malaria drug during self-medication in their study in Senegal.³³ This can probably be the case in Ho.

Some of the respondents also said their malarial medication usually or sometimes make them feel weak after taking the drug. Some researchers have attributed client's weakness after taking malaria medication to the inability of patients to eat properly before taking their medication. Malaria comes with loss of appetite for food, so most patients attempt to take their medication on empty stomach where the drug reactions make them lose their biochemical equilibrium and feel weak and dizzy after taking the drugs.³⁴

Many of the respondents were of the view that, the number of tablets in their malaria treatment dose are too many and it discourages adherence to the medication. However, some of the respondents still bought some more drugs to complement the prescribed medication since they feel the ACTs are not potent enough. Nevertheless, over 62% of them do not agree to this and said they do not add any other medication to their prescribed doses for their malaria treatment. This current finding is not in accordance with Yukich et al, in Zambia where most of the patients even reduced their prescribed doses and add self-medication to their malaria treatment.³⁵

It is interesting to know that most of the respondents agreed to some factors affecting their non-adherence to anti-malarial medication and cost was one of these

factors. As reported by Elmannan et al, cost of drug is a major factor influencing drug adherence.³⁶ Though Ghana and many other African countries have seen price subsidies on the cost of malaria medication, most (over 53%) of the respondents in this study still agreed that the cost of the medication is a hindrance to their adherence to the medication. The government of Ghana is already working hard at reducing the cost burden of healthcare in Ghana through the national health insurance scheme (NHIS) which will go a long way to reduce cost of most anti-malarial medication.³⁷

Most patients also have the believe that the ACTs given to them in the hospitals are not potent enough to cure their current condition, so they go in to purchase malaria medications with higher cost. Also, patients believed that the number of tablets, and forgetfulness contributes to non-adherence, they mentioned that, when the malaria symptoms subsides after taking the medications for sometimes, they usually forget to continue with the rest of the medication. This act as said, earlier, contributes greatly to non-adherence leading to massive drug resistance in future episodes of malaria. Some of the patients also naturally, just do not like to take medications. The current study findings are similar to that of a study by Aung et al, where they worked on “assessment of adherence to three days course of artemether-lumefantrine treatment in Rakhine state, Myanmar” where they revealed that, discontinuation as condition improved, skipped one or more dose (s), intended to take dose later and side effect of drug were most reasons for patients’ non-adherence to anti-malarial medications (artemether-lumefantrine treatment).²

Similarly, a study by Mbiti found the following factors as reasons for non-adherence to malaria medication; schedule was hard to follow, dose repeated after child vomited, caregiver work schedules, artemether-lumefantrine dose forgotten and Some artemether-lumefantrine tablets got spoiled.³⁸ Finally this study did not monitor patients during their treatment course but only assessed patients adherence and non-adherence level through self-report and contributing factors that influenced their non-adherence to anti-malarial medication.

CONCLUSION

The findings of this study revealed low level of adherence to antimalarial medication among patients that visited VRH. Most of the respondents (63.4%) self-reported non-adherence to antimalarial medication. The following factors were found to be attributed to patients’ non-compliance to anti-malarial medications; bad taste, number of tablets involved, busy work schedule, cost of antimalarial drug, forgetfulness and also dislike for malarial medication and other medications as well. Based on our findings, we would like to recommend that, the number of tablets to be taken per dose, should be reduced, in order to improve adherence. Also,

manufacturers should work on the taste and smell of the malarial treatment drugs to enhance compliance. Further studies should be tailored towards ways to improve patients’ adherence to antimalarial medication in other to avoid drug resistance in the near future.

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