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COUNSELING AND EDUCATIONAL INFORMATION RECEIVED BY PATIENTS PLACED ON ARTEMISININ COMBINATION THERAPY FOR MALARIA FEVER TREATMENT AND THE INFLUENCE OF SUB-OPTIMAL INFORMATION ON PATIENTS PERCEPTION

John David OHIEKU* and Emmanuel Elisha WIRBUIN

Department of Clinical Pharmacy and Pharmacy Administration, Faculty of Pharmacy, University of Maiduguri, PMB 1069, Maiduguri, Borno State, Nigeria.

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***Corresponding Author**
Dr. John David OHIEKU
Department of Clinical Pharmacy and Pharmacy Administration, Faculty of Pharmacy, University of Maiduguri, PMB 1069, Maiduguri, Borno State, Nigeria.

ABSTRACT

Introduction: Patients counseling and education is an important tool that motivate patient's medication adherence while the understanding of adherence problems or perceptions about ACT and the level of information or its understanding thereof received by patients is key to formulating appropriate strategies toward optimizing ACT pharmacotherapy. **Objective:** The objectives of the study were to assess the counseling and educational information obtained by patients on ACT used in malaria treatment, and to assess patients' specific factors that may affect medication rates and compliances. **Results:** Malaria illness affects all age strata but a very high proportion (80%) of cases occurred in those who are between the age bands of 10-30 years. The proportion of female patients in the study 207(51.8%) is slightly higher than the male patients 193(48.2%). Many patients 127 (31.2%) witnessed multiple malaria fever episodes in the last one year while 273(68.8%) patients had one case each during the same period. Among the repeated episode group, 48(37.8%) previously used non ACT agents. Only 79(19.8%) were advised to take lumefantrine containing ACT with fatty meal in order to enhance good outcome while about 215(53.8%) were counseled to complete their medication even when they feel well half-way into their medications use. Only 86 (21.5%) were told to repeat another dose if vomiting occurred within 30 minutes of ACT oral use. As high as 345(86.2%) do not know that ACT is not meant for preventive therapy. In evaluating patients compliant regarding ACT use, 249(62.2%) indicated that they feel better before completing ACT therapy and may

sometimes abandon subsequent dose(s). About 165(41.2%) do not like the side effects of ACT while 75(18.3%) feel that the duration of ACT is too long. High costs of ACT were the issues raised by 155(38.8%) patients and 116(29.0%) further indicated having compliance problems with ACT therapy. **Conclusion:** A high proportion of patients do not receive enough drug counseling and educational information on ACT medication, which may have reflected for the various inappropriate perceptions toward ACT and malaria fever management.

KEYWORDS: Artemisinin Combination Therapy, Malaria fever, patients' perceptions.

INTRODUCTION

Malaria is one of the endemic illness ravaging several countries in Sub-Saharan regions of the world that has an outcome of high morbidity and mortality in children, pregnant women and other populace. The illness is also associated with very high economic loss particularly in malaria endemic regions. For, instance, in some countries of Sub-Saharan Africa, high rate of monthly income may be spent in managing malaria illness using ACT and other adjunct therapies and management plans.[1]

Among the various species of malaria viz plasmodium vivax, ovale, falciparum and malariae; plasmodium falciparum and vivax are identified as the most common cases[2] with the falciparum specie causing substantial morbidity and majority of mortality.

The clear objectives and goals of treatments in malaria therapy is to prevent morbidity and mortality across any age stratum in falciparum malaria while at the same time preventing resistances to medications as well as curtailing the transmission of malaria by reducing the parasite reservoir. Owing to the established resistances of the parasite to conventional monotherapy, the attainment of positive clinical outcomes and goal of therapy is currently based on ACT based approach with other measures.[3]

The introduction of ACT as a therapeutic agent in the management of uncomplicated malaria fever has made great impact in malaria management. However many issues relating to patients, health care providers, and ACT medication are far from being resolved. Among the most common combinations of ACTs in used currently as double combination are arthemether-lumefantrine, artesunate-amodiaquine, artesunate-mefloquine, and dihydroartemisinin-piperaquine while triple combination is artesunate-sulfadoxine-

pyrimethamine. ACTs have been adjudged to have efficiency of over 90% in treating malaria[4] and with combinations like artemether-lumefantrine and dihydroartemisinin-piperaquine to be tolerated in addition to their excellent efficacies worldwide.[5]

ACTs combinations offers a double therapeutic benefits as artemisinin components or its derivatives act fast to cause early parasitic clearance, the partner drugs sustained the clearance of all parasites in addition to preventing recrudescence in uncomplicated malaria[4], thereby preventing each other's resistance.[6] The combination is furthermore important in the sense that artemisinins alone are short acting antimalarial agents that kill parasite more rapidly than conventional antimalarial drugs while one or two long–acting antimalarial drug such as amodiaquine, mefloquine, sulfadoxine/pyrimethamine or lumefantrine as ACT to prevent resistance[7] and sustain clearance.

With these sterling advantages couple and good safety and effectiveness profile, ACT is no doubt has made an impressive impact and revolution in malaria management today thereby making it mainstay therapy in malaria management. But there are worries here and there of problems associated with adherences, poor knowledge of patients and patients' perceptions as well as the level of instruction received by patients from health care professionals regarding ACT. According to some authors[8] for instance, patients adherences is an interplay of a range of factors including patients' view and attribute, illness characteristics, social context, access and services issues. Therefore, making ACT and other treatment modalities accessible is not enough to eradicate the ever growing problems in malaria disease but the treatment must also be appropriately directed by health care providers.

OBJECTIVES

The objectives of this study are to assess the counseling information obtained by patients on ACT for malaria treatment, and to assess patients' specific factors that may affect medication rate and compliance.

MATERIAL AND METHODS

The study was carried out at the University of Maiduguri Medical Center and University of Maiduguri Teaching Hospital (UMTH). Both health facilities are situated in Maiduguri, the capital city of Borno state located in North-Eastern Nigeria. Borno state has a total landmass of 57,799Km^2 (22,316 SqM) (Wikipedia) ranked the 3rd biggest state in Nigeria, with the population of 4,171,104 (2006) and density of 72/Km^2 (190/SqM).

The cross-sectional survey involve patients with uncomplicated malaria reporting to Pharmacy units of University of Maiduguri Medical Center and that of University of Maiduguri Teaching Hospital were, who met the criteria of presenting with malaria fever without other illnesses and showing a laboratory evidence of the illness.

Ethical clearance was obtained from the Research and Ethical Committee, University of Maiduguri Teaching Hospital (UMTH). The study focused on whether all patients diagnosed with uncomplicated malaria get appropriate information on the treatment course and what their view was about ACT. Compliance was ascertained through administration of a semi-structured questionnaire to the patients or caregiver. A total of 400 patients were enrolled into the survey and the study lasted for five months from January to May.

The patients' demographic data (age, sex, marital status, occupation) were retrieved from prescription and/or questionnaire administered. Other information such as the patients' understanding of ACT, type of ACT used or prescribed, compliance and factors affecting compliance were either obtained from their prescription orders or from on formation provided in the questionnaire. Descriptive statistics were used to presents result of variables.

RESULTS

The mean age and standard deviation of the studied population is 24.45 ± 9.71 years. Malaria illness affects all age strata but a very high proportion (80%) of cases occurred in those who are between the age bands of 10-30 years (Table 1). The proportion of female patients in the study 207(51.8%) is slightly higher than that of male patients who are 193(48.2)-Table 2. Majority 290(72.5%) of the patients are single with 85 (21.2%) constituting the married population. A total of 269 (67.2%) patients have either attained or undergoing tertiary level of education Table 2).

Malaria cases within the last one year were new episode in 273(68.8%) cases while multiple episodes occurred in 127 (31.2%). Among the repeated episode group, 48(37.8%) previously used non ACT agents (Table 3).

Only 79(19.8%) were advised to take ACT with fatty meal in order to enhance good outcome while 215(53.8%) were counseled to complete their medication even when they feel well half-way into their medications usage. In another relatively poor result, only 86 (21.5%) were told to repeat another dose if vomiting occurred within 30 minutes of ACT oral use. However

a high proportion 251(62.8%) were told why they must use analgesic along with ACT and 241 (60.2%) of patients were given preventive measure of sleeping under mosquito treated nets. A little above average 214(53.5%) knows what ACT meant but just 90(22.5%) knew its use in malaria therapy. In another assessment, on 55(13.8%) were told not to use ACT for prevention while as high as 345(86.2%) do not know that ACT is not meant for preventive therapy (Table 4). More than average population studied 226(56.5%) were told to return to facilities if symptoms persisted. Although more than average 214(53.5%) have the knowledge of what ACT meant but only 90(22.5%) are aware of its use in uncomplicated falciparum malaria (Table 4).

In evaluating patients problems relating to ACT medication use, 88(22.0%) reported not understand the need for ACT use while 69(17.2%) do not believe the usefulness of ACT medication. However 249(62.2%) indicated that they feel better before completing ACT therapy. About 165(41.2%) do not like the side effects of ACT while 75(18.3%) feel that the duration of ACT is long. The compliant by 155(38.8%) patients is on high cost of ACT and 116(29.0%) further indicated having compliance problem. Multiple medication use is a problem in 137(34.2%) cases while the problem of 108 (27.0%) patients is not having time to take medication. Forgetfulness was reported by 153 (38.2%).

Table 1: Tabular Representation of Categorized Age of Patients.

Age Bands (yrs)	Frequency	Percentage (%)
0.1-10.0	7	1.8
10.1-20.0	139	34.8
20.1-30.0	184	46.0
30.1-40.0	42	10.5
40.1-50.0	20	5.0
50.1-60.0	5	1.2
60.1-70.0	3	0.8
Total	400	100

Table 2: Other Demographic Characteristics of Patients.

Domain	Characteristics	Frequency	Percentage (%)
Sex	Male	193	48.2
	Female	207	51.8
	Total	**400**	**100**
Marital status	Single	290	72.5
	Married	85	21.2
	Divorced	16	4.0
	Widow	7	1.8
	Widower	2	0.5
	Total	**400**	**100**
Educational status	Primary	33	8.2
	Secondary	69	1.2
	Tertiary	269	67.2
	Adult education	14	3.5
	Informal	11	2.8
	Uneducated	4	1.0
	Total	**400**	**100**

Table 3: A Tabular Representation of the Type of drug previously Used in the Past.

	Type of Drug	Frequency	Percent (%)
	NA	273	68.2
	Artemether/Lumefantrine	62	15.5
	Artesunate/Amodiaquine	14	3.5
	Sulphadoxine/Pyramethamine	48	12.0
	Artequick	1	0.2
	Dydroartemisinin-piperaquin	1	0.2
	Artesunate/mefloquine	1	0.2
	Total	400	100.0

Table 4: A Tabular Representation of Counseling Information Given to Patients.

Domain	Information Given to Patient	Proportion informed			Total (%)
		Yes (%)	No (%)	NA (%)	
Medication use	To complete drug even if well half-way	215(53.8)	185(46.2)	-	400(100)
	To take medication with fatty meal	79 (19.8)	270 (67.5)	51(12.8)	400(100)
	To repeat dose if vomit occurred within 30 minutes	86 (21.5)	314 (18.5)	-	400(100)
	To take ACT along with analgesic	251(62.8)	149 (37.2)	-	400(100)
Follow-up	To return to facility if symptoms persist	226(56.5)	174 (43.5)	-	400(100)
Prevention	To sleep under a mosquito treated bed net	241(60.2)	159(39.8)	-	400(100)
Knowledge	Monotherapy not used in *P. falciparum*	109 (27.2)	291 (72.8)	-	400(100)
	Knowledge of ACT side effects	80 (20.0)	320 (80.0)	-	400(100)
	That ACT is not for malaria prevention	55(13.8)	345(86.2)	-	400(100)
	ACT not used in pregnancy	76(19.0)	324(81.0)	-	400(100)
	Knowing the meaning of ACT	214(53.5)	186 (46.5)	-	400(100)
	ACT recommended in uncomplicated falciparum malaria	90(22.5)	310(77.5)	-	400(100)

Table 5: A Tabular Representation of Factors Affecting ACT Medication Use.

Patients Factor Relating to ACT use	Response/Problems		Total (%)
	Yes (%)	No (%)	
Do not understand the need for ACT medication	88 (22.0)	312 (78.0)	400(100)
Do not believe the usefulness of ACT medication	69 (17.2)	331 (82.8)	400(100)
Feel better before finishing ACT regimen treatment course	249 (62.2)	151 (37.8)	400(100)
Do not like the side effects of ACT drugs	165(41.2)	235 (58.8)	400(100)
Feel worst whenever ACT regimen is taken	52 (13.0)	348 (87.0)	400(100)
Duration of ACT treatment is long	75 (18.8)	325 (81.2)	400(100)
ACT medication is expensive	155 (38.8)	245 (61.2)	400(100)
ACT medication has no effect	65 (16.2)	335 (83.8)	400(100)
Cannot take ACT medication as prescribed	116 (29.0)	284 (71.0)	400(100)
Have to take many medications	137 (34.2)	263 (65.8)	400(100)
Not having time to take medication	108 (27.0)	292 (73.0)	400(100)
Do not like taking medications	198 (49.5)	202 (50.5)	400(100)
Always forgetting to take drugs	153 (38.2)	247 (61.8)	400(100)
Lacking confidence on competences	36 (9.0)	364 (91.0)	400(100)

DISCUSSION

Malaria is one of the most frequent tropical diseases with no preferences with little or no age, gender, occupational and educational preferences. Malaria illness affects all age strata but a very high proportion of cases occurred in those who are between the age bands of 10-30 years in this study. WHO[2] also reported that majority of malaria fever occurs in children and adolescents. This result is not unexpected since majority of the subjects studied are within this age bracket. The female population in this study is slightly higher than that of the male, a pattern that is similar to the work of Uzochukwu and Onwujekwe[9] in South-East Nigeria. Our result may not have indicated that there is preponderances of malaria fever in female over their male counterpart in the region since previous reports suggested that the health seeking behavior using institutional facilities is higher among females compared to the males.[10,11] Other authors have reportedly explained in other related studies in the region that the male often have preferences in using non-institutional health facilities in cases not considered severe so as to avoid economic loss or time wastage or safe time for other purposes.[10] However, the overwhelming dominance observed in marital status where the singles are higher than the married population and in educational status where those undergoing tertiary level of education are higher than other levels is expected since it represents a reflection of the studied environment.

In this study, we observed frequent repeated episode of malaria fever in close to one-third of the population as adjudged by frequent use of ACT or antimalarial agents (Table 3). This

pattern of result may have confirmed the pandemic nature of the illness or suggested the high level of poor adherences to these agents or both as the case may be. Generally, malaria may appeared to be poorly managed because most people seeking for interventions from providers or health professional may have tried one form of self-medication or other treatment modalities that failed before seeking further superior management.

We observed gaps in knowledge in many patients about malaria fever as an illness, its management or treatment purposes, ACT use and so on. Many patients do not understand the fundamental basis of malaria management. Also the level of information relating to use of ACT is deficient in many respects. For instance, as low as one-fifth of the population studied were told to take artemether-lumefantrine with fatty meal, a combination that enhanced absorption and efficiency.[12] Food intake significantly enahances the bioavalability of both artemethether and lumefantrine, an effect which is more apparent for the highly lipohilic lumefantrine. A meal with only a small amount of fat is considered sufficient to achieve adequate exposure to lumefantrine.[13]

Only a small proportion of patients were told not to use ACT during the first trimester of pregnancy. There is limited data available regarding safety profile of artemisinins in early pregnancy. They are, therefore, not recommended by WHO as first-line treatment for malaria in first trimester due to associated embryo-foetal toxicity in animal studies.[14] Communicating this information to pregnant women or women seeking to be pregnant is important, moreso that most people are involved in self-medication.

The problem of poor communication or insufficient patients' education on ACT use appeared to a general occurrences. Similar studies made by Chatio and associates[15] in Northern Ghana revealed lack of knowledge as a result of health providers' inability to educate patients on the proper use of medication affected ACT medication adherence.

Furthermore, only a little above one-fifth were told to repeat another dose of ACT if vomiting occurred within 30 minutes of previous intake, an instruction that become necessary since both medication side effects and malaria symptoms can present with nausea and vomiting.

Many patients may also stop their medications half-way when they perceived wellness during the course of medication intake. This problem has long being identified in previous studies.[16] Close to half of the patients were never warned on such practices. However, a little

above half of the populations studied were told to complete the treatment course even when half way well, and return to facility if symptoms persisted. Incomplete therapy is one of the fundamental problems because not just because of therapy failures or chances of increasing resistance development that will constitute a health care burden, but also the fact that the health facilities may be overstressed due to increased or repeated physician visits, re-hospitalization and economic loss arising from lost wages.

Patient counseling and education is an important tool to improve patient's adherence to ACT medication. Using analgesic concomitantly with ACT and using of mosquito nets were the only major point of emphasis by the professionals in this study. Many patients (close to two-fifth) were however, not counseled to adopt preventive such measures by sleeping under mosquito nets. It is often assumed that patients should know this information. This notwithstanding, efforts should always be made to control environmental conditions that favor mosquito breeding.

It is easy to explain the reasons for poor counseling information received by several patients in this study. Firstly, we previously reported that as an academic environment where the study is conducted, most patients are often faced with having to meet up with deadlines and as such not much time is given to dispensing counseling.[17,18] Secondly, even when time is not a factor, the availability of qualify professional personnel detailed with this responsibility are either unavailable or deficient in number. Thirdly, many patients may obtain their medication from several sources outside the institution health facilities or from non-professional outlets.

There are numerous factors that affects ACT medication adherence rate that were self-reported patients. Among the topmost factors is perceived wellness after the initial few doses greatly. This is consistent with the study carried out in Northern Ghana by Chatio and associates[15] on adherence and uptake of ACTs for uncomplicated malaria where most respondent felt that the illness or condition was better after they had taken the initial dose of the medication and made them stop taking the remaining medicine.

Individual attitudes toward the drug, not liking taking drugs and the side effects associated with the use of these ACTs were found to be the main factors affecting adherence to the use of ACTs. It is worthy of note that other factors such as poly-pharmacy and forgetfulness also affects adherence rate to a lesser extent. These findings is in contrast with the study made by

Chatio and associates[15], forgetfulness and intake of many medications by patients affected ACT adherence in patients with malaria. Problem relating to affordability of ACT affect patients' ACT use was not reported as major factor in this study, and this finding is in accordance with the study made by Onyango and colleagues[19] in Kenya which revealed that ACT was more affordable at government health institution as compared to other sources.

Several negative perceptions by patients capable of affecting adherence, which could only be solved through patients education and counseling were reported by several patients. Some patients do not understand the need or believe on the usefulness of ACT possibly because of previous experiencing of poor clinical outcomes in the past that may be occasioned by inadequate supervision or guidance of ACT usage. Side effects and intolerance were reasons advanced by some patients when on ACT. Many people who are possibly used to the erstwhile single dose monotherapy believe that the duration of ACT use is too long and complex while many more has consider cost as deterrent cause to their non-preference to the use of ACT. One will envisage these groups of individual in an educational institution where this study was conducted and more so that a high proportion of the population studied are university students. For some others persons high pills burden and do not like to take medication is their issues with ACT use.

One key responsibility health care professionals owe patients in respect to appropriate use of ACT in a setting like ours is appropriate and continuous patients education and counseling since ACTs take a number of days to complete.

CONCLUSION

Understanding patients' related adherence problems or perceptions about ACT and the level of information or its understanding thereof received by patients is vital toward formulating appropriate strategies toward optimizing ACT therapies during patients' pharmacotherapy care.

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