WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 6.805
Volume 5, Issue 5, 1411-1419. Research Article ISSN 2277– 7105

PRESCRIBING TRENDS OF ANTIMALARIAL DRUGS IN A PRIMARY HEALTH CARE FACILITY IN DELTA STATE

Arute John E.*[1], Ojieabu Winifred A.[3], Patani-Okolosi Omotejohwo E.[2], Iwor Chioma P.[1]

[1]Department of Clinical Pharmacy and Pharmacy Administration, Faculty of Pharmacy, Delta State University, Abraka, Nigeria.

[2]Department of Pharmaceutical Microbiology, Faculty of Pharmacy, Delta State University, Abraka, Nigeria.

[3]Department of Clinical Pharmacy and Biopharmacy, Faculty of Pharmacy, Olabisi Onabanjo University, Sagamu, Ogun State, Nigeria.

Article Received on
16 March 2016,
Revised on 08 April 2016,
Accepted on 30 April 2016
DOI: 10.20959/wjpr20165-6119

***Corresponding Author**
Arute John E.
Department of Clinical Pharmacy and Pharmacy Administration, Faculty of Pharmacy, Delta State University, Abraka, Nigeria.

ABSTRACT

Introduction: Malaria is one of the most prevalent and devastating diseases in the tropics. The objective of this study is to evaluate the prescribing pattern of antimalarial drugs in a primary health care centre using WHO current guidelines and WHO prescribing indicators. **Methods:** A retrospective study of prescriptions of antimalarials between January 2009 and December 2013 was carried out by systematic random sampling among outpatients aged 0-100 in a Primary Health Care Centre at Ika South Local Government Area of Delta State Nigeria. Data was collected and recorded using a WHO Prescriber Indicator Form. Data was analyzed using descriptive statistics of frequency and percentages with the aid of Microsoft Excel. **Results:** Of the 1030 prescriptions selected, 733 were antimalarial prescriptions. Malaria prevalence was higher in the age group 0-10 (55.5%). Combination therapy was 75% of the 733 prescriptions and the commonest combination treatment was Artemether-Lumefantrine (63.7%). The average number of drugs per encounter was 4.6. The percentage of antimalarial drugs prescribed by generic name was 43.1. The percentage of antimalarial prescriptions with antibiotics and an injection were 30.2 and 24.3 respectively. The percentage of antimalarials prescribed from the EDL was 97.6. **Conclusion:** The pattern of antimalarial drug prescription

in this study is in tandem with the current WHO guidelines on the treatment of uncomplicated malaria with most of the prescriptions being Artemisinin Combination Therapy (ACT).

KEYWORDS: Malaria, Antimalarials, Prescriptions, Prescribing Indicators.

INTRODUCTION

Malaria is one of the most prevalent and devastating diseases in the tropics. Primary health care centres are the entry point into the health care sector aimed at providing health care services to the grass root. It is estimated that only about 20% of malaria cases are treated in health care centres as the management of malaria in primary health centres is adjudged as low.[1]

Inspite of considerable efforts throughout the century to eradicate or control malaria, it is still the most prevalent and most devastating disease in the tropics mainly due to poor therapy or irrational drug use. Following the change in the policy for malaria treatment in Nigeria, artemisinin-based combination therapies (ACTs) were adopted in 2005 as first-line therapy instead of chloroquine due to reports of resistance.[2] Although, this policy may be effective as claimed by some authorities [3], the mortality rate of malaria is still high. To address this issue, it is important that prescribing trends be assessed to ensure the effectiveness of this new policy.

OBJECTIVES

Main Objective

- To evaluate prescribing trends of antimalarial drugs with WHO current guidelines and WHO prescribing indicators.

Specific Objectives

- To determine the prevalence of malaria at a Primary Health Centre.
- To compare prescribing trends of antimalarial drugs with WHO current guidelines and WHO prescribing indicators.

METHODS

Study Area: The study was carried out at the Primary Health Centre, Ika South Local Government Area, Agbor, in Delta State, Nigeria. Ika South Local Government Area lies between latitude $6^0$13m and $6^0$20m in the North and Longitude $6^0$25m and $6^0$29m 162,594.[4]

The vegetation of the study area is mainly luxirant, deciduous and evergreen forest. The climate is a tropical climate characterized with rainy and dry season. Rainfall is between 17cm and 200cm annually. Average temperature is about 24^0C (70^0F).

It is made up of twelve clans. Agbor is the headquarters of Ika South Local Government Area. The people speak Ika dialect of the Ibo language and are well known for their farming prowess.

The principal malaria vector is *Anopheles gambiae* species with predominant transmission of *Plasmodium falciparum* infection.

Study Design: A retrospective study of prescription pattern of antimalarials between January 2009 and December 2014 was carried out by systematic random sampling.

Study Population: The study population consists of a total of prescription records of both male and female outpatients aged 0-100 years. A large sample size which exceeded the minimum of 100 suggested by WHO was employed in order to enhance the reliability of the results since only one health facility was used in the study.[5]

Study Sample: Systematic random sampling was employed. The average number of prescription for each year was 1236, that is a total of 6,180 prescriptions for five years (2009-2013). This resulted in a sampling interval (factor) of 6. That is every sixth prescription was assessed for antimalarial drugs prescribed. This was summed to 206 prescriptions per year.

Sampling interval (factor) $K = \frac{N}{n}$

Where n is the sample size (1030) and N is the population size (6,180).

$$K = \frac{6{,}180}{1030}$$

$$= 6$$

Data Collection: Data was collected and recorded using a WHO Prescriber Indicator Form [5] which consists of demographic information, number of medicines prescribed as generic, name of prescribed drugs, number of prescriptions with an antibiotic and injection.

Data Analysis: Descriptive statistics of frequency and percentage were used for analysis with the aid of Microsoft excel.

Procedure for Calculating Prescribing Indicators

Average number of drugs per encounter was calculated by dividing the total number drugs prescribed by the number of prescriptions surveyed. Percentage of drugs prescribed by generic name was determined by dividing the number of drugs prescribed by generic name by the total number of drugs, which was then multiplied by 100. Percentage of encounters with a antibiotic and injection prescription was calculated by dividing the number of patient encounters during which an antibiotic or an injection was prescribed by the total number of encounters surveyed, which was then multiplied by 100, respectively. Percentage of drugs prescribed from the essential drug list was determined by dividing the number of products prescribed form the essential drug list of the hospital by the total number of drugs prescribed, and then multiplied by 100.

Ethical Clearance

Ethical clearance was obtained from the Health Department of Ika South Local Government Secretariat prior to the study.

RESULTS

Among the 1,030 prescriptions assessed during the study, 733 were considered valid for analysis of antimalarial prescription pattern in the PHC, as shown below in Table 1.

Table 1: Types of diseases treated at the PHC

Disease diagnosed	Frequency	Percent %
Malaria	733	71.2
Diarrheal disease	76	7.4
Respiratory tract infection	66	6.4
Dermatitis	55	5.3
Others	100	9.7
Total	**1030**	**100**

* Others = UTIs, Typhoid fever, Anaemia, Ear and eye infection,

The demographic characteristics of the patients treated of malaria disease are shown in Table 2 and Figure 1. Analysis of the 733 prescriptions indicates that more females 420 (57.3%) than male 313 (42.7%) patient were admitted for malaria treatment.

Table 2: Age and Sex distribution of patients treated of malaria disease

Characteristics	Frequency	Percent %
Sex: Male	313	42.7
Female	420	57.3
Total	733	100
Age (years)		
0-10	407	55.5
11-20	106	14.5
21-30	126	17.2
31-40	53	7.2
>40	41	5.6
Total	**733**	**100**

Malaria prevalence was higher in the females and the vulnerable age group 0-10 years. Monotherapy accounted for 25% of the 733 prescriptions. The commonest drug prescribed as monotherapy was chloroquine (14.2%). Combination therapy was 75% of the 733 prescriptions and the commonest combination treatment was Artemether – lumefantrine (63.7%). (Table 3).

Table 3: Prescription pattern of antimalarial drug combination and monotherapy.

Antimalarial Drug Regimen Prescribed	Frequency	Percent %
Monotherapy		
Chloroquine	104	14.2
Quinine	42	5.7
Sulphadoxine-pyrimethamine (SP)	27	3.7
Artesunate	7	1
Artemether	2	0.3
Halofantrine	1	0.1
Combination therapy		
Artemether/lumefantrine	467	63.7
Artesunate/amodiaquine	59	8.0
Chloroquine/sulphadoxine-pyrimethamine	24	3.3
Total	**733**	**100**

Table 4: Prescribing Indicators

Prescribing Indicators	N=733
Average number of drugs per encounter	4.6
% of drugs prescribed by generics	43.1%
% of encounters with an antibiotic	30.2%
% of encounters with an injection	24.3%
% of drugs prescribed from the EDL*	97.6%

*Essential Drug List

DISCUSSION

This was a restrospective study aimed at evaluating the prescribing trends of antimalarials in a Primary Health Care Centre. The index of this study revealed that malaria accounted for the most common cause (71.2%) of outpatient visit in the health centre (Table 1) with prevalence more in the vulnerable group of 0-10 years. This finding is in correlation with that from Agbo et al where malaria accounted for 43.1% of the most common cause of outpatient visit at the urban primary health centre studied with 0-10 years also being the prevalent age group.[6] This is quite different from the study by Builders et al which revealed that the most affected age group was 21-50 years.[7]

This study showed a significant use of Artemisinin based combination therapy (ACT) for the treatment of uncomplicated malaria. This agrees with other recent studies conducted in Nigeria.[8, 7, 9, 10]

The percentage of antimalarial drugs prescribed by generic name was low (43.1%). This corresponds with previous studies by Igboeli et al which highlighted poor use of generic name in antimalarial prescriptions.[8] Similarly, findings from Builders et al revealed a low percentage of antimalarial drugs prescribed by generics name.[7] This contradicts WHO recommendation in promoting rational use of drugs that states that drugs should be prescribed in their international proprietary names.[11]

The pattern of antimalarial prescribing revealed a wide variety of antimalarial drugs. Artemether –lumefantrine, Chloroquine, and Artesunate-amodiaquine were the first, second and third most commonly prescribed antimalarials respectively. Although, ACTs accounted for 75% of the prescriptions, 25% of the prescriptions were other antimalarial compounds (monotherapy) including very low Artemisinin monotherapy (1.3%). This correlates with the current WHO treatment guideline for uncomplicated malaria which advocates the use of ACTs and dissuades the use of Artemisinin monotherapy.[12] This is due to the fact that irrational use of artemisinin and its derivatives as monotherapy may lead to the emergence of drug resistant malaria parasites.[13] The study corresponds to a recent study in Lagos where ACTs formed 95% of first line treatment of uncomplicated malaria in adults and 81% in children.[10] This however was not the case before now as studies conducted prior to the policy change from monotherapy to ACTs recorded frequent prescriptions of monotherapy particularly Chloroquine and Sulphadoxine-pyimethamine. For instance, a study conducted in

University of Benin Teaching Hospital revealed that Chloroquine and SP accounted for 67.2% of antimalarial prescriptions.[2]

Based on WHO prescribing indicators, some of the prescribing patterns encountered in this study fell below the required standard. The average number of drugs prescribed per encounter (4.6) was relatively higher than the recommended range of 1.6-1.8. Similar values have also been encountered in previous studies including Eze & Olowu and Igboeli et al having values of 3.9 and 3.6 respectively.[14, 8] A plausible reason for the high incidence of polypharmacy in the primary health care center may be due to lack of appropriate diagnostic procedures as malaria diagnosis in PHC is mostly based on presenting symptoms and presumptions. This may result in certain drug therapy problems like non-adherence, unnecessary medication and drug-drug interaction.

The study also revealed that less than half of the drugs were prescribed by generics. This finding is comparable to the value observed by another study conducted in Nigeria.[8] This indicates non-compliance to the WHO standard. It is important that prescription of drugs by generic name be implemented as this will improve drug quality and pricing advantage.

The use of antibiotics was above the WHO recommended range of 20-26. Most of the antibiotics prescribed were broad spectrum antibiotics such as Gentamicin. This may result in increased rate of resistance of organisms treated with such drugs.

It is worth noting that the use of injections was within the recommended range of WHO (13.4-24%). The number of antimalarial drugs prescribed from the Essential Drug List was very high similar to that of the study conducted Abuja.[8] This is laudable and will result in the provision of high quality d rugs that are less expensive, effective and safe.

Limitations: This study had certain limitations. The principal limitation was that the prescription data obtained was retrospective; pharmacy outpatient prescriptions were used. This created impossibility for some important data such as on parasitology and clinical profiles of patients to be collected. Therefore, the prescription patterns could not be correlated with clinical assessment that influenced the prescriptions.

Another limitation is that only one PHC was used, which may influence the generalization of the results.

CONCLUSION

The pattern of antimalarial drug prescription in this study is in tandem with the current WHO guidelines on the treatment of uncomplicated malaria with most of the prescriptions being Artemisinin Combination Therapy (ACT).

ACKNOWLEDGEMENT

We the authors appreciate the support of the staff of the primary health centre used for this study. All authors read and approved the final manuscript and declared no conflict of interest.

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