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Research Article

Prescription Pattern of Antimalarial Drugs in Two Secondary Health Facilities in Rivers State, Nigeria

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Abstract

Background: Malaria is a major public health problem and is still accounting for increased morbidity and mortality till date when not properly treated. It is caused by species of the parasite, *Plasmodium* of which *P.falciparum* is mostly implicated. The disease burden is still very high in Nigeria where it accounts for more cases and deaths than any other country in the world. Prescription practices have been shown to influence the emergence of resistance to antimalarial drugs[2]

Objective: To assess the prescription pattern of antimalarials in adults at two secondary health facilities in Rivers State, Nigeria

Method: Prescription pattern of antimalarial drugs was carried out at General Hospitals Terabor and Ahoada with collection of data from medical records of 299 and 339 case notes respectively of malaria patients which were sorted out from the records for a period from January 2016 - September 2019. Essential data collected were age, type of anti-malarial prescribed, other drugs on prescription, total number of drugs per prescription and injectables prescribed. Descriptive statistics from Statistical Package for Social Sciences (SPSS version 22) was used for the analysis.

Results: The result showed that Artemisinin-based Combination Therapies (ACTs) was the most frequently prescribed antimalarial with Arthemeter/Lumefantrine having a prescription frequency of 181 (60.5%) and 248 (73.1%) respectively for Terabor and Ahoada General Hospitals followed by Dihydroartemisinin/Piperaquine 70(23.4%) and 58(17.1%) then Artesunate – Amodiaquine 17 (5.7%) and 12 (3.5%) respectively. The non-ACTs prescribed were Injection Artemether [8(2.7%) and 2(0.6%)]; Injection Arteether [7(2.30) and 15 (4.4%)]; Inject ion Artesunate [11(3.7%) and 3(0.9%)]; Quinine [3(1.0%) and 1(0.3%)] all for Terabor and Ahoada General Hospitals respectively. Also, Sulphadoxine/Pyrimethamine 2 (0.7%) for Terabor and none for Ahoada.

Conclusion: Artemisinin-based combination therapies were most frequently prescribed as antimalarial drug in the two Health facilities. This indicates adherence to WHO 2015 Guideline on the prescription of anti-malarial medications for uncomplicated malaria. However, adherence to National Guidelines for the diagnosis and treatment of Malaria was not total. Percentage of drug prescribed using unbranded generic names was much lower as prescriptions were majorly either in innovator brand name or branded generic names.

Keywords: Prescription, pattern, Artemisinine-based combination therapy

INTRODUCTION:

Malaria is still a major public health problem till date notably in sub Saharan Africa and other malaria endemic zones of the world and is still accounting for increased morbidity and mortality especially when not properly treated[1]. It is however, preventable and curable[2]. Five main species of *Plasmodium: Plasmodium ovale; P. vivax; P. malariae and P. falciparum* and *P. knowlesi* have been known to cause malaria in human with *P. falciparum* being mostly implicated in the sub-Saharan Africa. Other species are still being investigated. Appropriate treatment with the right medication is a key component of any national or global malaria control program.

WHO recommends the use of Artemisinin-based combination therapy (ACT) in all cases of uncomplicated *Plasmodium falciparum* malaria for the treatment and management[3] Nigeria ado[6]pted Artemether-Lumefantrine and Artesunate Amodiaquine as first and second line antimalarial therapy for uncomplicated malaria since 2005[4]. And subsequent review of the Guideline in 2010 was concluded without inclusion of other ACTs like Artesunate-Mefloquine, Artesunate-sulphadoxine/Pyrimethamine or Dihydroartemisinin-Piperaquine which are also been prescribed and used in the country but only recognized their availability in WHO Antimalarial Guidelines recommendations. There was therefore a change in malaria treatment policy in Nigeria since 2005 from monotherapies of Chloroquine or Sulphadoxine/

Pyrimethamine to Artemisinine-based combination therapies based on WHO's recommended Guidelines and Nigeria's adoption of her first- and second-line ACTs necessitated by the prevalence of resistance of the malaria parasite, *Plasmodium falciparum* to the then known efficacious antimalarial drugs[5]

Irrational use of anti-malarial medication is one of the major challenges affecting the prevention, treatment and cure of malaria[6]. This has stemmed from certain unwholesome prescription practices which have been shown to influence the emergence of resistance to some of the antimalarial drugs[7], thus the success of any treatment policy or Guidelines would to a great extent depend on the adherence of health providers and patients to Policy or Guidelines recommendations[8]. Some studies in Nigeria have revealed that appreciable gaps in knowledge exist with respect to rational drug use among health care professionals[9,10].

Therefore, assessment of prescription pattern for antimalarial drugs could help in determining rational and irrational prescription practices among health care practitioners in relation to malaria treatment.

General Objectives

To evaluate the prescription pattern of antimalarial drugs and level of Adherence to National Malarial Treatment Guidelines in two Secondary Health facilities in Rivers state, Nigeria

Specific Objectives

- To assess the types of Antimalarial drugs commonly prescribed and used in the selected health facilities.
- To determine the most frequently prescribed antimalarial for the treatment of uncomplicated malaria in the selected facilities
- To assess the level of adherence to National Guidelines in the Diagnosis and Treatment of malaria in the selected health facilities in the State

METHODS

Research design: A cross-sectional retrospective evaluation of the Antimalarial drugs on prescriptions for uncomplicated malaria for the past three years in two strategic Government secondary Health facilities, one from a senatorial zone in the State

Study site: The study was conducted at the Outpatient Departments (OPD) of General Hospitals, Terabor in Gokana Local Government Area and Ahoada in Ahoada East Local Government Area both in Rivers State, Nigeria.

Study Population

The study population includes patients, who attended the OPDs of the stated Hospitals in Rivers State and their prescriptions contained antimalarial drug(s) in the period under study.

Techniques of Data collection

Prescriptions of 299 patients containing antimalarial drug(s) were randomly selected one out of two from antimalarial prescriptions sorted out from the records at the OPD of General hospital, Terabor. While 339 antimalarial prescriptions were selected from General Hospital, Ahoada using the same protocol all for a period of three years (January 2016 - September 2019). The essential data are the age, type of anti-malaria drug prescribed and prescription pattern using generic names or brand names.

Level of adherence of prescribed antimalarials to National Guidelines (NG) was calculated as:

% adherence to National Guideline =

$$\frac{\text{No. of prescriptions written according to NG}}{\text{Total no. of prescription written in the period}} \times 100$$

$$= \frac{\text{sum of prescription with Artemether- Lumefantrine or Artesunate-Amodiaquin}}{\text{Total no. of antimalarial prescriptions written in the period}} \times 100$$

Percentage of encounter with injection

$$= \frac{\text{Frequency of antimalarial injection prescribed}}{\text{Total no. of prescribed antimalarial in the period}} \times 100$$

% encounter with antibiotics = $\frac{\text{Total no. of antibiotics on prescription}}{\text{Total no. of prescriptions}} \times 100$

Inclusion Criteria: Prescriptions of patients having antimalarial drug(s) and selected

Exclusion Criteria

Prescriptions of patients without antimalarial drug(s) in the period under study

Ethical Consideration

Ethical approval was obtained from the Health Research Ethics Committee of the Rivers State Government. While administrative approval was obtained from the Rivers State Hospitals Management Board, Port Harcourt with Reference No: RSHMB/DMDS/4/VOL.9/201 for the sites before the commencement of the study.

Data analysis

Descriptive statistics was used to assess frequencies and percentages using SPSS version 21

RESULTS

Results of the retrospective study of the prescription pattern of antimalarials used in the two secondary Hospitals in Rivers State were as indicated below.

Table 1: Demographics

Gender	Terabor n(%) N=299	Ahoada n(%) N=339
Male	135 (45.2)	142 (41.9)
Female	164 (54.8)	197 (58.1)
Age (Years)		
< 5	94 (31.4)	46 (13.6
5 – 12	28 (9.4)	29 (8.6)
>12 – 18	10 (3.4)	18 (5.3)
>18 – 35	97 (32.4)	101 (29.8)
>35	70 (23.4)	145 (42.7)

Table 2: Types of Antimalarial drugs on prescriptions

Drug	Terabor n(%) N=299	Ahoada n(%) N=339
Artemether-Lumefantrine	181 (60.5)	248 (73.1)
Artesunate- Amodiaquine	17 (5.7)	12 (3.5)
Dihydroartemisinine- Piperaquine	70 (23.4)	58 (17.1)
IM Artemether	8 (2.7)	2 (0.6)
IM Arteether	7 (2.3)	15 (4.4)
IM Artesunate	11 (3.7)	3 (0.9)
Quinine	3 (1.0)	1 (0.3)
Sulphadoxine-Pyrimethamine	2 (0.7)	-

Table 3: Antibiotics co-prescribed

Antibiotic drug	Terabor n(%) N=299	Ahoada n(%) N=339
Amoxicillin	25 (8.36)	32 (9.43)
Amoxicillin-Clavulanic acid	7 (2.34)	9 (2.65)
Cefuroxime	10 (3.34)	15 (4.42)
Ceftriazone	3 (1.00)	12 (3.53)
Ciprofloxacine	42 (4.04)	58 (17.1)
Co-Trimoxazole	20 (6.68)	31 (9.14)
Doxycycline	3 (1.00)	5 (1.47)
Erythromycin	8 (2.6)	5 (1.47)
Fluconazole	8 (2.67	10 (2.94)
Laevofloxacine	2 (0.67)	5 (1.47)
Metronidazole	19 (6.35)	30 (8.84)

Table 4: Other Classes of drugs prescribed

Class of drug	Terabor n(%) N=299	Ahoada n(%) N=339
Analgesics	266(88.96)	298 (87.90)
Anthelmintics	12 (4.01)	18 (5.30)
Antiemetics	3 (1.00)	4 (1.17)
Antihistamines	51 (17.05	74 (21.82)
Antihypertensives	11 (3.67)	13 (3.83)
Antiulcers	7 (2.34)	12 (3.53)
Cough syrups	18 (6.02)	26 (7.66)
Drugs for sleep disorders	3 (1.00)	5 (1.47)
Multivitamin	289 (96.65)	318 (93.80)

Table 5: Facility performance as per WHO Drug Use Indicators

Variable	Facility	
	Terabor G.H.	Ahoada G.H.
Average no. of drugs/encounter	3.69	3.89
% encounter with antibiotics	49.1	62.5
% encounter with injection	8.69	5.89
% Adherence to National Guidelines on malaria management	66.2	76.6

DISCUSSION:

Rational prescribing practices have not yet been realized globally and are still leading to unwanted consequences in patients. Studies assessing prescription pattern in disease conditions seems to be a common phenomenon in many developing countries yet, improvement in prescribing practices is still far from being optimal. Majority of antimalarial prescriptions covered in the study were those of the age 18 years and above. This does not mean that adults are rather having higher malaria prevalence in the area but that their selection could possibly be due to chance. It however agrees with the work of Builders *et al.,* 2014[11] where the most affected age was found to be between 21 – 50 years. Average number of drugs per encounter were 3.69 and 3.89 respectively which were higher than the WHO admissible range of 1.6 – 1.8 drugs per encounter. This is evidence of polypharmacy which may reduce medication adherence while encounter with injection was lower than WHO permissible level of 13.4 to 24.1. This is somehow encouraging as oral medication is most often recommended first in medical practice except where the condition warrants injectable. Percentage encounter with antibiotics (49.1 and 62.5) was however higher considering the WHO/INRUD specifications of 20 – 26.6. This is an indication of over prescription of antibiotics which could lead to antibiotic resistance and therefore should be discouraged. Antibiotic Stewardship program could benefit these facilities. Adherence to National Guidelines was respectively 66.2% and 76.6% for Terabor and Ahoada General Hospitals as such, adherence was therefore not optimal. Prescription of medicines in their generic names was not common as majority of drugs were prescribed in their brand names. This was not expected as recommendation for prescriptions of drugs in their generic names has long been made by WHO as a way of enhancing medication cost reduction and affordability (WHO, 1995) especially for developing economies[12].

CONCLUSION:

Artemisinin-based combination therapies were the antimalarials mostly prescribed and used with Artemether-Lumefantrine having the highest frequency. There were however, certain antimalarial monotherapies also prescribed.

Adherence of prescriptions to National Guidelines in the two hospitals were both above average but not optimal, with Ahoada adhering relatively more than Terabor General Hospital

Prescription of medicines in their generic names was not common as majority of drugs were prescribed in their brand names

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Author's Contribution: Dr B. M. Bagbi conceived the idea for the Study and designed the processes for the work. Dr. Alagala M.B. assisted in the data collection, sorting and collation. Dr Bagbi analyzed the data and wrote the Article and Dr. Alagala edited it.

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REFERENCES:

1. World Health Organization (2014). World Malaria Report 2013. World Health Organization Google Scholar, Geneva

2. WHO (2019) Malaria www.who.int/malaria/areas/treatment/en/

3.WHO. Guidelines for the treatment of Malaria. 3rd edition (2015). Accessed at http://who.int/iris/bitstream/10665/162441/1/9789241549127_eng.pdf

4. FMOH. National Guidelines for the Diagnosis and Treatment of Malaria. 3rd edition, 2015.

5. Gbotosho GO, Happi1 CT, Ganiyu A, Ogundahunsi OA, Sowunmi A, Oduola AM. Potential contribution of prescription practices to the emergence and spread of chloroquine resistance in south-west Nigeria: caution in the use of artemisinin combination therapy. Malar J. 2009: 1-8 https://doi.org/10.1186/1475-2875-8-313 PMid:20042098 PMCid:PMC2807872

6. Bagbi B. M., Ukwe C. V. and Adibe M. O. Antimalarial drug utilization pattern amongst staff of three health facilities in Rivers State, Nigeria. African Journal of Pharmacy and Pharmacology. 2021;5(12):219 - 229. https://doi.org/10.5897/AJPP2021.5280

7. Yousif MA, Adeel AA. Antimalarials prescribing patterns in Gezira State: precepts and practices. East Mediterr Health J. 2000; 6:939-947. https://doi.org/10.26719/2000.6.5-6.939

8. Zurovac D, Rowe AK, Ochola SA, Noor AM, Midia B, English M, Snow RW. Predictors of the quality of health worker treatment practices for uncomplicated malaria at government health facilities in Kenya. Int J Epidemiol. 2004; 33:1080-1091. https://doi.org/10.1093/ije/dyh253 PMid:15256523

9. Chukwuani C. M., Onifade M. and Sumonu K. Survey of drug use practices and Antibiotic prescribing pattern at a general Hospital in Nigeria. Pharm World Sci 2002; 24:188-95. https://doi.org/10.1023/A:1020570930844 PMid:12426963

10. Okoh A. (2012). An assessment of rational drug use in public tertiary hospital in Edo State, Nigeria. Geneva Health Forum GHF Research Project; 2012

11. Modupe I Builders, Hannah Degge , Jonah Y Peter and Emmanuel Ogbole. Prescription Pattern of Antimalarial Drugs in a Teaching Hospital in Nigeria. British Biomedical Bulletin. 2014.

12. World Health Organization (WHO) 1995. The Use of Essential Drugs (including the 8th Model List of Essential Drugs). Geneva: World Health Organization, 1995. Technical Report Series 850. Available at: who-dap-94-11en.PDFs.