Antimalarial prescribing under the National Health Insurance Scheme (NHIS)

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ABSTRACT

Background: Malaria is still a dreaded disease in many developing countries. Artemisinin-based Combination Therapy (ACT) was adopted for malaria control as it offers better efficacy to previous chloroquine-based remedies. The National Health Insurance Scheme (NHIS) was established to provide access to qualitative care at an affordable cost from different professional members of the healthcare team. Enrolees access care for approved health conditions in accredited facilities.

Objectives: The objective was to document the antimalarial prescribing practices on prescriptions from NHIS-accredited medical facilities received in an NHIS-accredited community pharmacy in Lagos.

Methods: A retrospective review of all the prescriptions received at the target NHIS-accredited pharmacy from four NHIS-accredited clinics over a 3-year period (2006-2008) was carried out using a modified WHO/INRUD prescribing indicator form. Data obtained was analyzed using descriptive and inferential statistics at p=0.05. Results were presented as frequency tables and charts.

Results: About 51% of the prescriptions were for female patients. Over 60% of the prescriptions included an antimalarial. About 45% of the antimalarials prescribed was sulphadoxine/pyrimethamine (syrups and tablets). The use of ACTs increased over the 3-year period from about 9% to about 46% mainly as Artesunate plus a sulphadoxine-pyrimethamine product.

Conclusion: Most of the antimalarial prescriptions did not comply with the antimalarial treatment policy of the country. Continuing Medical Education programs are required to improve prescriber knowledge and practice. Supervision of facilities by NHIS officials to ensure sustainability and good health outcome is recommended.

Key words:
Malaria, NHIS, Antimalarial Prescriptions, Treatment guidelines, ACT(s)

Prescription des antipaludiques dans le cadre du système national d'assurance santé (SNIS)

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RÉSUMÉ

Contexte: Le paludisme reste une maladie redoutable dans de nombreux pays en développement. Combinaisons thérapeutiques à base d'artémisinine (ACT) a été adopté pour le contrôle du paludisme car il offre une meilleure efficacité de remèdes à base de chloroquine précédentes. Le régime national d'assurance santé (SNIS) a été créé pour fournir un accès aux soins qualitatifs à un coût abordable à partir de différents membres professionnels de l'équipe de soins de santé. Personnes inscrites ont accès aux soins pour les conditions de santé agréés dans des établissements agréés.

Objectifs: L'objectif était de documenter les pratiques de prescription antipaludiques sur les ordonnances de NHIS accrédité équipements médicaux reçus dans une pharmacie communautaire SNIS accrédité à Lagos.

Méthodes: Une étude rétrospective de toutes les prescriptions reçu à la cible pharmacie SNIS accrédité de quatre cliniques SNIS accrédités sur une période de 3 ans (2006-2008) a été réalisée en utilisant une forme d' i dicateur de l'OMS / INRUD de prescrire modifié . Les données obtenues ont été analysées à l'aide de statistiques descriptives et inférentielles à p = 0.05. Les résultats ont été présentés sous forme de tableaux et graphiques fréquence.

Résultats: Environ 51 % des prescriptions étaient pour les patients de sexe féminin. Plus de 60% des prescriptions inclus un antipaludique. Environ 45% des antipaludiques prescrits était la sulfadoxine / pyriméthamine (sirops et comprimés) . L'utilisation des ACT a augmenté au cours de la période de 3 ans d'environ 9 % à environ 46 %, principalement en Artésunate plus un produit sulfadoxine -pyriméthamine.

Conclusion: La plupart des prescriptions antipaludiques n'étaient pas conformes à la politique de traitement antipaludique du pays. Poursuite des programmes de formation médicale sont nécessaires pour améliorer la connaissance et la pratique prescripteur. Contrôle des installations par des fonctionnaires SNIS pour assurer la durabilité et de bons résultats de santé est recommandée.

Mots clés: paludisme, SNIS, antipaludiques prescriptions, directives de traitement, ACT (s)

INTRODUCTION

Malaria constitutes a major health problem in most developing countries. [1] It causes significant morbidity and mortality, especially in children and pregnant women. The costs associated with malaria and its treatment is often enormous.[1,2] The disease is a major cause of poverty in Nigeria as about 46 percent of an average household income is expended on treatment of malaria.[2] Globally, 300-500 million people are believed to contact the disease annually resulting to about 1.2-2.7 million deaths,[3-5] the majority of which occur in sub-Saharan Africa.[1,6] Malaria accounts for the greatest singular cause of morbidity and mortality in Nigeria.[6,7] ACTs have been adopted for malaria control by many African countries including Nigeria.[8,9] The World Health Organization (WHO) guidelines on malaria control stipulates that adequate clinical and parasitological response of levels less than 75% should be addressed by a drug policy review.[10-14] Use of Chloroquine and other monotherapies such as sulphadoxine-pyrimethamine (SP) was discontinued and the new anti-malarial policy adopted in 2005 with Artemeter/Lumefantrine combination being the selected drug of choice.[8,9,14] ACTs offer better efficacy than the traditional drug regimens to which the *falciparum* species have developed near complete global resistance.[9,14,15]

The National Health Insurance Scheme (NHIS) was established by Decree 35 of 1999 but formally launched in Nigeria in April 2005.[16,17] Health care facilities including Hospitals, Pharmacies and Laboratory facilities are accredited to provide care to enrolees.[16] Prescriptions generated by NHIS-accredited medical facilities are required to be filled by NHIS-accredited pharmacies. Though awareness of the NHIS is not yet optimal,[18-20] those that have registered are utilising the services for the treatment of various approved healthcare conditions. The treatment policy advocates use of artemether/lumefantrine as drug of choice for malaria and it is expected that care provided is in line with this policy. The main objective was to document the antimalarial prescribing practices on prescriptions from NHIS-accredited medical facilities received in an NHIS-accredited community pharmacy in Lagos.

METHODS

The survey was conducted in an NHIS-accredited community pharmacy where prescriptions are sent by different NHIS-accredited medical facilities. All prescriptions filled at the pharmacy in the selected time frame of year 2006 - 2008 was assessed. (The time frame was chosen to coincide with the initiation of NHIS activities in the State as launch of NHIS was followed by different administrative requirements before activities actually started). A total of 1232 prescriptions were analyzed over the three-year period from four NHIS-accredited clinics. A modified WHO/INRUD detailed prescribing indicator form[21] was used to collect relevant information (such as number of drugs prescribed) from the prescriptions. In addition demographic and NHIS-specific information was collected on each prescription. Data obtained was analyzed using standardized WHO/INRUD formula,[21] Microsoft Excel and EPIINFO statistical software. Results were presented as frequency tables and charts. Where appropriate, inferential statistics using the Chi-squared test using relevant critical values and degrees of freedom (at 95% confidence interval, p=0.05) was determined.

RESULTS

A total of 1232 prescriptions were available over the 3 year period under review. Most of the prescriptions were for adult patients across the various facilities and years of assessment. About 51% of the prescriptions were for female patients. Over 66% of the patients were above 19 years of age and about 23% are 11 years and below. Eleven prescriptions (1.1%) had no clinic indicated, eight had no gender (0.6%) of patients indicated, six (0.48%) had no date of prescription indicated and 18 prescriptions (1.5%) had no age indicated (Table 1).

Table 1: Prescription source by patient age

Items	Age of Respondents (in years)				
	Not indicated N=18	0-11 years N=288	12-19 years N=109	>19 years N=817	TOTAL (%) N=1232
Clinic					
Not indicated	4	2	2	6	14 (1.1)
A	10	128	40	365	543 (44.1)
B	1	54	21	182	258 (20.9)
C	0	10	7	43	60 (4.9)
D	3	94	39	221	357 (29.0)
Total (%)	**1.5**	**23.4**	**8.8**	**66.3**	**100.0**
Gender					
Not indicated	4	1	0	3	8 (0.6)
Female	6	146	51	424	627 (50.9)
Male	8	141	58	390	597 (48.5)
Year					
Not indicated	6	0	0	0	6 (0.5%)
2006	2	123	58	400	583 (47.3)
2007	2	51	19	107	179 (14.5)
2008	14	114	32	304	464 (37.7)
Total (%)	**1.5**	**23.4**	**8.8**	**65.8**	**100.0**

Average number of drugs was calculated to be 4 drugs per prescription/encounter. Over 63% of the prescriptions had between 3 to 6 drugs prescribed across the various patient age groups (Table 2)

Table 2: Number of drugs prescribed by patient age

No. of Drugs	Age of Respondents (in years)				
	Not indicated N=18	0-11 years N=288	12-19 years N=109	>19 years N=817	Total (%) N=1232
1	0	5	7	50	62 (5.0)
2	0	25	5	97	127 (10.3)
3	7	49	11	178	245 (19.9)
4	2	73	30	181	286 (23.2)
5	2	75	29	141	247 (20.0)
6	3	34	14	90	141 (11.4)
7	1	20	9	42	72 (5.8)
8	1	3	4	30	38 (3.1)
9	1	3	0	6	10 (0.8)
10	0	1	0	2	3 (0.2)
11	1	0	0	0	1 (0.1)

Sixty-one percent of the prescriptions featured an antimalarial medication over the three year period while 39% of them had no antimalarial prescribed (Figure 1).

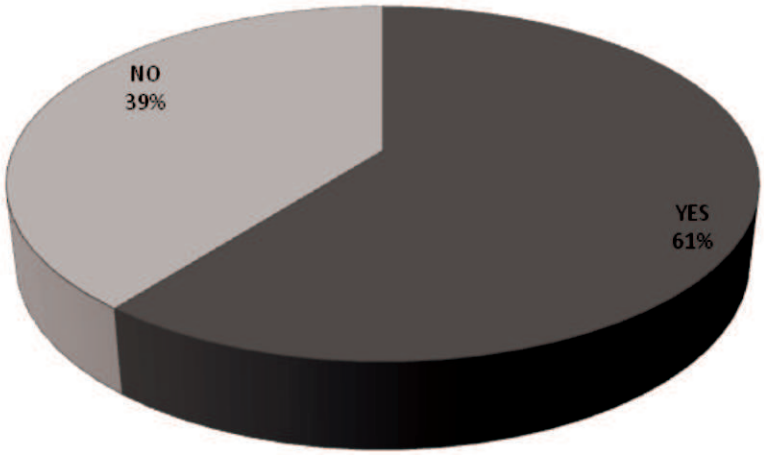

Figure 1: Antimalarial present in prescription

Table 3 shows a breakdown of antimalarial dosage forms prescribed over the 3-year period. As adult patients were in the majority, tablets represented the most frequently utilized form of antimalarials.

Table 3: Antimalarials prescribed

Antimalarials prescribed	Frequency	Percentage
Injection		
Artemether Injection	1	0.1
Total injection		**0.1**
Syrup		
Chloroquine	38	4.2
Sulphadoxine/Pyrimethamine	36	3.9
Artesunate	25	2.7
Halofantrine	8	0.9
Artemether	3	0.3
Amodiaquine	2	0.2
Dihydroartemisinin&Piperaquine Phosphate	10	1.1
Total syrups	**122**	**13.3**
Tablets		
Sulphadoxine/Pyrimethamine	371	40.6
Artesunate	228	25.0
Chloroquine	70	7.7
Amodiaquine	30	3.3
Halofantrine	12	1.3
Proguanil	1	0.1
Quinine	1	0.1
Artesunate&Amodiaquine	65	7.1
Dihydroartemisinin&Piperaquine Phosphate	10	1.1
Artemether&Lumefantrine	2	0.2
Artesunate&Mefloquine	1	0.1
Total tablets	**791**	**86.6**

Over the various age groups, monotherapy, either with an artemisinin product (like Artesunate) or other non-artemisin product (like Fansidar®) was common (Table 4).

Table 4: Antimalarial drug type by patient age

Items	Age of Respondents (in years)				
	Not indicated N=18	0-11 years N=285	12-19 years N=108	>19 years N=808	Total (%) N=1219
ACT	10	55	25	114	204 (16.7)
ART-mono	2	40	16	76	134 (11.0)
Combination	0	15	0	16	31 (25.4)
Other-mono	1	91	38	244	374 (30.7)
None	5	84	29	358	476 (29.0)

KEY: ART-Mono (Monotherapy with Artemisinin-based product); Other-Mono (Monotherapy without an artemisinin-based product) Combination (Two or more antimalarials without Artemisinin-based product); AL – Artemeter/Lumefantrine

Table 5 shows that prescribing of ACTs and Artemisinin monotherapy increased from about 9% to about 46% from year 2006 to 2008 and a concurrent decline in the prescription of other monotherapies ('Other-Mono') and combination antimalarials without an Artemisinin product ('Combination') occurred in the same time frame (about 38% to about 11%) (Table 6).

Table 5: Antimalarial drug type prescribed by year

Items	2006 (%) N=583	2007 (%) N=179	2008 (%) N=456	Sub-Total (%)	Total (%)	χ^2 (Critical value)
ACT	33 (4.4)	14 (1.9)	157 (21.2)	204 (27.5)		
ART-Mono	32 (4.3)	55 (7.4)	47 (6.3)	134 (18.1)		299.2 (15.51)$^{\alpha}$
Combination	17 (2.3)	4 (0.5)	9 (1.2)	30 (4.0)		
Other-Mono	266 (35.8)	33 (4.4)	75 (10.1)	374 (50.4)		
Sub-total	348	106	288	742 (100.0)	742 (60.9)	
None	235	73	168		476 (39.1)	

$^{\alpha}$ Statistically significant, p value = 0.05;
KEY: ART-Mono (Monotherapy with Artemisinin-based product); Other-Mono (Monotherapy without an artemisinin-based product) Combination (Two or more antimalarials without Artemisinin-based product)

DISCUSSION

The results show that ACTs were used in about 28% of the treatments. The malaria treatment policy recommends Artemether/Lumefantrine and Artesunate/Amodiaquine as the recommended drugs for malaria.[9,14] However, Artemether/Lumefantrine was prescribed only twice in the three year period under survey. Conformity to policy recommendation was low in this study probably because of cost considerations or availability of the product. This is contrary to the findings from a survey carried out in Ghana where most of the prescriptions followed the treatment policy of the country.[22]

Artesunate (AS) was highly deployed either alone or prescribed along with other antimalarials such as Sulfadoxine-Pyrimethamine (SP), Chloroquine (CQ) and Amodiaquine (AQ). Use of AS monotherapy is not recommended in the malaria treatment policy[9] and its continued use is extremely worrisome as it may promote resistance to artemisinin-based combinations and compromise the effectiveness of the ACTs.[8,23,24]

Over the 3-year period, only one injectable antimalarial was prescribed. This is not surprising as community pharmacists are not licensed to administer injections and so prescriptions coming to the pharmacy would ideally not include injections. The 3 most common antimalarial syrups prescribed were chloroquine syrup (usually as monotherapy), branded Sulphadoxine-Pyrimethamine (Fansidar®) syrup (usually in combination) and Artesunate syrup (usually in combination). The 3 most common antimalarial tablets prescribed were Artesunate tablets (alone or in combination), branded Sulphadoxine-Pyrimethamine (Fansidar®) tablets (alone or in combination) and another branded Sulphadoxine-Pyrimethamine (Malacure®) tablets (usually as monotherapy). Coartem®, the only Artemether/Lumefantrine combination prescribed featured in only two prescriptions over the three year period.

The single most prescribed drug for malaria in this survey was branded Sulphadoxine-Pyrimethamine (Fansidar®), prescribed alone or in combination with other drugs including AS, CQ and AQ. Sulfadoxine-Pyrimethamine (SP) is cheaper than other malaria medicines and was the second line treatment in the old malaria treatment policy[24,25] and may have been favoured for these reasons. However, prescription of SP monotherapy was discontinued along with CQ when the malaria treatment policy was changed.[12,16] Prescription of AS with SP became popular and adopted as an Artemisinin-based combination product because of the reduced cost for the treatment of malaria.[26] This is perhaps in compliance with the new treatment policy. In a previous study, utilization of SP was also high though not as high as documented in this study.[22]

The high level of use of CQ in this study was also unexpected. The results reveal that CQ was the most commonly prescribed antimalarial liquid dosage form and the third highest solid dosage form prescribed and it was prescribed alone and in combination with other drugs such as AS and SP. Since the drug efficacy tests carried out in the six geopolitical zones in the country showed a national average of 39.2% efficacy[12-14] for CQ, one would have expected healthcare providers (Doctors and Pharmacists) to refrain from prescribing it and stocking it in their dispensaries.[25] Breakdown of the result shows that CQ use was more in the early years of NHIS (year 2006) than the later (year 2008).

It is worthy of note that though prescription of other remedies apart from AS is high, the trend decreased significantly over the 3 years of the survey from about 36% to 10%. Also prescription of ACTs, and even artemisinin monotherapy, which was low in the year 2006 increased over the years to the year 2008 from about 4% to almost 30% for ACTs. This increase can be explained by the fact that the change in treatment policy was still fairly recent.[9,14] As in this study, a similarly low utilization of ACTs was recorded for this period in another study which buttresses the fact that the change in policy was yet to be well entrenched.[24]

Results obtained in this study revealed that few instances of fixed dose combination artemisinin-based products or co-formulations were used compared to use of two single products used together. The most utilized co-formulation contains AS-AQ which is the second-line treatment for malaria. The reason for this is unclear and may be adduced to more favourable pricing or availability of the product over the other co-formulated products. However, the malaria treatment policy states that the selected ACTs are co-formulated Artemeter and Lumefantrine (AL) and Artesunate/Amodiaquine (AS-AQ), which is presently available in co-packaged blisters.[9,14] Co-formulations would greatly help adherence to the anti-malarial medication.[23]

The result obtained buttresses the fact that malaria is a major cause of illness in developing coutries with over 60% of the prescriptions having an antimalarial prescribed. Literature documents that malaria is an important cause of death and illness in children and adults in tropical countries.[25,27,28]

CONCLUSION

Over the three years covered by this survey, it can be concluded that antimalarials are highly deployed for use on the NHIS-prescriptions. A gradual increase in use of ACTs was observed over the 3 years surveyed with artesunate in combination with other drugs being the most prescribed form. It showed that Sulphadoxine/Pyrimethamine and Artesunate are used significantly either alone or in combination with other anti-malarials and that Chloroquine was still being prescribed for the treatment of malaria. Continuing education programs on the malaria treatment policy should be carried out with prescribers to improve their practice. Appropriate monitoring by the management of NHIS should be carried out regularly to ensure continuous good practice by the prescribers

ACKNOWLEDGEMENTS

The authors declare no conflict of interest associated with this work. No funding was received for the conduct of the study nor preparation of the paper.

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