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Assessment of treatment pattern of uncomplicated malaria in peadiatric patients attending a teaching hospital in northwest Nigeria

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ABSTRACT

Malaria remains an important public health concern in countries where transmission occurs regularly, as well as in areas where transmission has been largely controlled or eliminated. This study assesses the pattern of treatment of uncomplicated malaria in young children attending a Teaching Hospital in Northwest Nigeria and prescribers awareness and attitude towards the new National Antimalarial Treatment Guidelines. The study design consist of a prospective cross-sectional study to assess caregivers treatment seeking habit for uncomplicated malaria in children and prescribers knowledge and attitude on the ACTs and a retrospective study to assess prescribing pattern and adherence to the Federal Government National Antimalarial Treatment Guidelines. The prospective study showed that 72% of the children received ACTs, 6% received chloroquine and 2% sulphadoxine/pyrimethamine, 20% other antimalarials . Analgesics and antibiotics were reportedly administered. 60% were diagnosis with malaria only, 15% malaria plus upper respiratory tract infections and 15% malaria with other conditions. Sixty percent of the physicians recommended ACTs as first line treatment of uncomplicated malaria, Twenty three percent of prescribers rated treatment response to ACTs to be excellent, 55% above average and 18.2% average. In the retrospective study, a total of 342 prescriptions were reviewed. sixty six percent of prescriptions contained ACTs. Average number of medicines per prescription was 5.4. Percentage of prescriptions containing more than 4 medicines was 6.7% and percentage of prescriptions containing less than 4 medicines was 40.4%. The study showed that the pattern of treatment of uncomplicated malaria reflect high compliance with the policy change from chloroquine to ACTs as first line antimalarial drugs. Despite some significant side effects, and irrational prescribing practices most prescribers opined that treatment outcome was above average.

Key words: Antimalarial, Paediatric Patient, Teaching Hospital, Prescribing pattern

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INTRODUCTION

Malaria is a major cause of death among children in many parts of the world, even though simple and effective treatments exist. Nigeria is a malaria-endemic area, and malaria is the principal cause of childhood mortality. The cumulative prevalence rate for malaria infection in most parts of the country is 100 percent in any 18 month period. It is estimated that at least 10 percent of all childhood deaths are due directly to malaria and 25 percent are due indirectly to it (Salako, 2004). Majority of victims are children under five who die because they do not receive treatment quickly enough (Alnwick, 2000; WHO, 1996). Malaria has an insidious and far-reaching effect on economic and social development. In addition to the direct costs of treatment and prevention, malaria is responsible for significant losses in productivity and undermines educational achievement. It discourages savings and investment by household, constrains optimal land use and deters foreign investment and tourism (WHO, 1999).

Roll Back Malaria was launched in 1998 bringing together multilateral, bilateral, nongovernmental, and private organizations. It made a clear pledge—to halve deaths from malaria by 2010. African heads of state endorsed the pledge at a summit in Abuja, Nigeria, in 2000 (Yamey, 2000). This endorsement was vital because 90% of the one million annual deaths from malaria are in Africa, mostly in young children and pregnant women.(Roll Back Malaria, 2004). Reducing the impact of malaria would significantly propel efforts to achieve the Millennium Development Goals, agreed by every United Nations member state. These include not only the goal of combating the disease itself, but also goals related to women's and children's rights and health, access to education and the reduction of extreme poverty (WHO). The roll back malaria aim is to reduce the malaria mortality in African children by half by the year 2010. This could be achieved provided certain criteria are met. These include: evidence of drug efficacy and safety, availability of sufficient quantities of drugs to meet the need, affordability, political commitment on the part of the government to change drug policy and a well thought out strategy to implement the change in drug policy.

The World Health Organization (WHO) has recommended that an antimalarial agent may not be used as first line when the level of resistance is above 25% in an area (WHO, 2001) hence the change in the Nigerian national guidelines for malaria treatment in the year 2005 (FMOH). The guidelines stated that the treatment of choice for uncomplicated malaria should be artemisinin based combination therapy (ACT). This consists of the use of an artemisinin derivative and another effective antimalarial drug and by WHO's definition, these drugs should be administered simultaneously, have schizonticidal effects and independent modes of action and different biochemical targets on the parasites. The basis of this combination therapy is to reduce duration of treatment and theoretically to improve cure rates and the speed at which resistance would develop. In tropical African countries, The combination therapies recommended by WHO (WHO, 2001) are as follows: artemether–lumefantrine, artesunate + amodiaquine, artesunate + sulfadoxine–pyrimethamine, artesunate + mefloquine combinations as the first choice of antimalarial therapy. The correct use of antimalarial drugs is the key not only to therapeutic success but also to deterring the patients' spread of drug resistance malaria (Oboli and Harrison-Church, 1978).

This study was carried out to assess the treatment pattern of uncomplicated malaria in children below 5 years in the Paediatric Out Patient Department (POPD) of Aminu Kano Teaching Hospital (AKTH), and to assess prescribers' awareness and attitude towards the new National Antimalarial Treatment Guidelines.

MATERIALS AND METHODS

Study Area: The study area was the Paediatrics Out-Patient Department (POPD) of Aminu Kano Teaching Hospital, Kano State Northwest Nigeria. Aminu Kano Teaching Hospital was established in August 1988 as the teaching hospital for Bayero University Medical School. The hospital was established to serve as a fully functional 500 bedding teaching hospital with state of the art facilities for provision of service, teaching and research to cater for the needs of the local and wider community.

The hospital currently has sixteen (16) clinical departments offering services, conducting trainings and research as well as over 10 support service departments including a diagnostic centre. The Hospital provides various services to the community in the field of health and social services through its clinical and service departments.

The hospital is a fee paying health facility; therefore, people are required to pay for services rendered at designated points. All patients presenting to the hospital are initially handled by the general outpatient department before further referral to their departments as appropriate.

STUDY DESIGN AND SAMPLING

The study design consist of a prospective cross-sectional study to assess caregivers treatment seeking habit for uncomplicated malaria in children and prescribers knowledge and attitude on the ACTs and a retrospective study to assess prescribing pattern and adherence to the Federal Government National Antimalarial Treatment Guidelines.

For the prospective study, care-givers visiting the hospital were consecutively approached until a target of 200 children with uncomplicated malaria was obtained, between the periods of January 2008-March 2008. They were interviewed (by exit interview) about how they sought treatment for their childrens illness _Their prescriptions were then assessed subsequently and .prescribers were also interviewed about their awareness and attitude towards the new National Antimalarial Treatment Guidelines.

The retrospective study spanned over a period of 6 months from January 2006- June 2006, prescriptions forms were systematically sampled for patients between the ages of 0-5 years from POPD.

Data collection
Questionnaire design and administration

The study instrument were two self administered well structured questionnaires, corrected and validated through peer review. One for the caregivers and the other for the prescribers.The questionnaires for the caregivers contained demographic information and treatment seeking practice while that for the prescribers contained questions to assess the knowledge of the prescribers on the diagnosis of malaria infections, their choice antimalarial drugs in treating the infection, as well as their level of awareness of the federal government national antimalarial treatment guideline on the policy change to ACTs.

In addition all study prescriptions were transcribed unto a data collection form and checked for accuracy before they were sent for analysis.

Ethical Approval: Ethical approval was obtained from the Ethics Committee of Aminu Kano Teaching Hospital.

DATA ANALYSIS

For the questionnaires serial numbers were given to each for ease of sorting and identification and they were coded to ensure correct entry of variables for analysis. They were also edited to ensure that responses were in agreement with each question item in the questionnaire.

For the data collection forms data was analyzed using WHO core drug use indicators. The core – prescribing indicators are:
- Average number of drugs per encounter
- Percentage of encounters with injections prescribed
- Percentage of drugs prescribed by generic name
- Percentage of drugs prescribed from Essential Drug List

Percentage of encounters with different antimalarials and percentage of encounter with antibiotics: percentage of encounters with Artemisinin derivatives only, percentage of encounters with Artemisinin derivatives with other antimalarials and percentage of encounters with ACT were also obtained. Finally correct antimalarials prescription were determined using the current National Antimalarials Treatment Guidelines. The data collected was analyzed using SPSS a statistical package.

RESULTS

Table 1 shows the sociodemographic characteristics of the care-givers at POPD of AKTH.

70% of the care-givers (mothers) reported purchase of their medicines within 24 hours of the child developing fever in the hospital while 10% purchased their medicine from nearby pharmacy or 'chemist' store. The remainder used "fever" medicines available in the home . caregivers with higher educational status were more likely to seek for adequate antimalarial treatment than those with lower status

The prospective study showed that 72% of the children received ACTs, 6% received chloroquine and 2% sulphadoxine/pyrimethamine, 20% other antimalarials (Table 2). Analgesics and antibiotics were reportedly administered. Patients with co-morbid conditions were more likely to receive an antibiotic in addition to their antimalarial medications than those with only malaria . A small percentage of caregivers claimed to use mosquito net, and insecticide treated nets as measures used to prevent malaria

Sixty percent (60%) of the diagnosis were malaria only, 15%, malaria plus upper respiratory tract infections and 15% malaria with other conditions. (Table 4)

In the retrospective study a total of 342 prescriptions were reviewed. Average medicines per prescriptions were 5.4. Percentage of prescriptions containing more than 4 medicines was 6.7% and percentage of prescriptions containing less than 4

Table 1 Sociodemographic characteristics of care-givers in the Paediataric Out Patient Department

Age Group (years)	Frequency	Percentage (%)
Children n=200		
0 - 11 months	65	32.50
1 year – 24 months	68	34
25 months – 5 years	67	33.5
Caregivers n=200		
Do not know		
15 – 20	14	7.0
21 – 25	5	2.5
26 – 30	45	22.5
31 – 35	49	24.5
36 – 40	53	26.5
41 and above	21	10.5
Education		
None	13	6.5
Primary	9	4.5
Secondary	4	2.0
Tertiary	104	52
	83	41.5
Occupation		
None	13	6.5
Self employed	12	6.0
Housewife	120	60
Civil Servant	47	23.5
Student	8	4

Table 2 Frequency of Antimalarial Prescriptions in the POPD of Aminu Kano Teaching Hospital.

Antimalarials	Frequency-P	Percentage	Frequency-R	Percentage
Chloroquine only	12	6	32	9.4
Sulfodoxine/ pyrimethamine(SP)	4	2	15	4.4
	20	10	27	7.9
Artesiminin derivative + CQ	24	12	23	6.7
Artesiminin derivative + sp	80	40	180	52.6
	25	12.5	5	1.5
Artemether+ lumefantrine	15	7.5	20	5.8
Artesunate + mefloquine	20	10	40	11.7
Artesunate +Amodiaquine				
Others				
Total	200	100	342	100

P-Prospective R-Retrospective

medicines was 40.4%. Percentage of prescriptions containing tablets form of antimalarials was 52.6% while percentage containing at least one injectable antimalarial was 2.9%. (Table 3). The percentage of prescriptions containing ACTs was found to be 60%. There was no statistically significant difference in theproportion of prescriptions containing ACTs in the prospective and retrospective study. .Percentage of prescriptions containing at least one antibiotic is 14.6%. Percentage of medicine prescribed in generics is 20% and percentage of medicines prescribed from essential drug list (EDL) is 90%. The percentage of incorrect

antimalarials prescriptions was very low (12%) (Table 5) Pls draw this table and compare with population ref values by Isah et al (check my IJPP 2008 paper)

Table 3 Various dosage forms of antimalarials prescribed in POPD of Aminu Kano Teaching Hospital.

Dosage form	Frequency-P	Percentage	Frequency-R	Percentage
Syrups only	70	35	50	14.6
Tablets only	60	30	180	52.6
Injections only	5	2.5	10	2.9
	30	15	20	6
Injection + syrups	25	12.5	60	17.5
Syrup + tablet	10	5	22	6.4
Injection + tablet				
Total	200	100	342	100

Table 4   Diagnosis of malaria by doctors in POPD

Procedure	Frequency	Percentage
Clinical manifestation	4	40
Malaria parasite (MP) Test	4	40
Both clinical manifestation + MP	2	20
Total	10	100

Findings from the prescribers questionnaires showed that 60% of respondents were males, while 40% were female. Sixty percent (60%) were medical officers, 20% consultant, while senior registrar and others were 30%.

Other antimalarials like quinine, halofantrine, and dihydroartemisinin were frequently used as monotherapy. Forty percent of the prescribers had attended a training programme on the use of ACTs, 50% through seminar, 65% through journals and 5% via television.

Sixty percent of the physicians recommended ACTs as first line treatment of uncomplicated malaria, reason given were: resistance to available drugs (61.4%) and the effectiveness of ACTs (27.3%)

Advantages of ACTs over other antimalarials as stated by the Prescribers include superior efficacy against resistance strains (93%) and fewer side effects (30%). Side effects reported include dizziness (20%), drowsiness (15%), weakness (30%) and others (35%). 28.3% of the doctors rated treatment response to ACTs to be excellent, 55% above average and 18.2% average. 90% of the respondents indicated cost as the possible major setback of ACTs use in our local settings, while 35% believed non-compliance on the part of the patient could be a major threat.

60% of doctors agreed with the national antimalarial treatment policy change from chloroquine to ACTs as first line antimalarial. 40% disagreed with the policy change, gave reasons like cost, subjectivity of chloroquine resistance and inaccessibility of ACTs The cost of treatment of childhood malaria in AKTH

ranges from #140 (USD1.00) (for chloroquine syrup, paracetamol syrup& multivite syrup) to #1,800 (USD12.00) for (Artemether+ Lumefantrine, paracetamol syrup, Amoxiclav suspension),or sometimes (Artesunate + mefloquine,Paracetamol syrup, inj promethazine, Mims drop) etc.

DISCUSSIONS

This study was carried out to assess   the pattern of treatment of uncomplicated malaria in young children and prescribers attitude towards the policy change on antimalarials in North Western Nigeria . The study showed that there were twice as many males than female patients majority of the children with uncomplicated malaria were male although malaria is not associated with sex preference but several studies have reported higher incidence in male (Arnaud et al, 2005; Bello et al., 2004; Etuk et al., 2008). This could be a mere reflection of sex distribution in the study population. The study revealed good knowledge of precribers on the available antimalarials drugs and the policy change. Also most of the care-givers received formal education as such they could promptly treat their children. The policy change from chloroquine to Artemisinin-based combined therapy (ACTs) was initiated in February 2005 while the combination of artemether + lumefantrin (Coartem ®) was officially adopted as the first line antimalarial (FMOH, 2005).

Despite reports from various studies of resistance to chloroquine and the subsequent change in policy (Ezedinachi et al., 1993; Falade et al., 1997; Meshnick et al., 1996), chloroquine was still prescribed. Findings from a previous study in Nigeria showed that chloroquine (CQ) remains the most frequently used drug for falciparum malaria for more than 40 years (Oreagba et al., 2008).This is most probably due to its easy availability and its affordability by patients which had been confirmed by studies carried out before the policy change (Aina, 2005; Taylor et al., 1998). Furthermore, even after the policy change implementation was not accompanied by adequate enlightenment about ACTs, thus the irrational prescribing of artemisinin derivatives as monotherapy. There is need to organize seminar for prescribers to appreciate the potential risk of resistance development if artemisinin is prescribed as monotherapy. Even though majority of the prescribers have good knowledge of the use of artemisinin combination therapy.

The study also showed that children between 12-60 months received highest proportion of ACTs. Study has also shown that this trend is also applicable to hospitalized patients of the same age group, as 29.1% of admissions for malaria in the hospital are below the ages of 5 years.( ) Furthermore, morbidity and mortality due to malaria is commoner in children (Oshikoya, 2007). Therefore interventions are focused more on the vulnerable age groups. In line with this the federal ministry of health made available to Aminu Kano Teaching Hospital coartem tablets to be given to children free. This could possibly explain the high percentage of Artemether + lumefantrine (coartem) prescriptions in the retrospective study. While it was lower in the prospective

study, because it was no longer available free of charge and the prescribers were yet to fully grasp and communicate the benefit of the ACTs to caregivers.

Some prescriptions contained combinations of chloroquine plus artemisinin derivatives. This combination is not in line with current guideline which states that chloroquine should not be used in areas where its resistance is prevalent (FMOH, 2005). Moreover chloroquine, displays pharmacological antagonism by antagonizing the antimalarial activity of artemisinin against P.*falciparium.* (Stahel et al., 1988)

Based on the WHO prescribing indicators, the findings from our study revealed irrational prescribing practices characterized by polypharmacy, i.e an average of 5.4 drugs per prescription. The average number of drugs per encounter is high for a single diagnosis (uncomplicated malaria). This may be due to the fact that malaria patients often bring complaints like aches, cough, reduced appetite and palour which accounts for the unnecessary inclusion of one or more vitamin preparations and antibiotics in the prescriptions. Poly pharmacy is unacceptable because of the possibility of adverse drug reactions, the incidences of which increases with the number of drugs. Also the most important medicines may be missed out during purchases because of high cost. The percentage of incorrect antimalarials prescriptions was very low compared to the results of earlier study which showed a higher percentage (65%) of incorrect prescriptions. (Oreagba et al., 2002)

The study also showed about 14.6% of encounters contained at least one antibiotic, this is within the range with earlier studies carried out in Uganda which is 15% (Obua et al., 2004). The prescription of antibiotics to malaria patients could be due to patients coming to hospitals with multiple infections. Also the result revealed 20% of drug prescribed were in generics, this is very low when compare with those obtained in other developing countries: Zimbabwe 94% and Tanzania 82% generics. One limitation of the study was the fact that the rural state hospitals were not studied. The good knowledge display on artemisinin combined therapy in the teaching hospital might not be applicable to the rural setting.

It is recommended that for easy access to ACTs and to reduce the cost burden on patient, there is need for subsidy on ACTs from government and non- governmental organization

Also to ensure rational use of ACTs by patients, an educational seminar for prescribers and public awareness campaign on the correct use of ACTs is needed.

CONCLUSION

The study showed that the pattern of treatment of uncomplicated malaria reflect high compliance with the policy change from chloroquine to ACTs as first line antimalarial drugs. Despite some significant side effects and irrational prescribing practices most prescribers opined that treatment outcome was above average.

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