

## Original Article

## Prescribing and Dispensing Practices for Malaria at Dispensary Level, White Nile State, Sudan 2005

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### Abstract

**Background:** The National Malaria Control Programme has adopted recently a new treatment guideline. The guideline recommends the use of artemisinin based combination therapy (ACT) as first and second line for uncomplicated malaria at all levels of health system. The aim of this study is to assess the prescribing and dispensing practices at the level of dispensaries in relation to treatment of malaria.

**Methods:** This is a descriptive, cross sectional, health facility based study conducted in White Nile State, central Sudan in September to October 2005, where all the four localities were included and represented by random selection of six administrative units. Out of all, 20 dispensaries and their health workers, as well as 734 patients were selected randomly and investigated using a modified WHO manual.

**Results:** The study found that 90% of the health workers have not been trained on the new protocol and Only 20% of dispensaries have a copy of the new protocol in poster form. Malaria diagnosis in only 25% of dispensaries depends upon symptoms, signs and microscopy. There is a high rate of prescribing combination of antibiotics with antimalarial as well as high rate of injectable preparations; 52.4% and 45% respectively. The most frequent antimalarial drug available in the dispensaries and prescribed for patients was chloroquine (32.1%). Out of all, 56.1% of prescription was a single drug and 57% of the prescription contained analgesic.

**Conclusion:** The implementation of the new treatment guideline at this level of health system is far from the required. Efforts are urgently needed to increase the coverage with ACTs

**Key words:** Prescribing and Dispensing, New Malaria Treatment Protocol. Dispensary

### Background

Malaria is amongst the most common diseases in the tropical areas. By the end of 2004, there were 107 countries and 3.2 billion people at risk of malaria transmission. An estimated 350–500 million clinical malaria episodes occur annually; mostly *Plasmodium falciparum*. This leads to death of more than one million individuals each year, mainly in young children and pregnant women<sup>(1)</sup>.

In Africa, malaria accounts for 25–35% of all outpatient visits, imposing a great burden on the already fragile health-care systems<sup>(2)</sup>. In the Sudan Malaria is endemic throughout the country, with 80% of the population living in epidemic-prone areas. More than 90% of cases are caused by *Plasmodium falciparum* and the primary vector is the *Anopheles arabiensis*. In Sudan, 7.5 million cases and 35,000 deaths are due to malaria every year; which is about 50% and 70% of all EMRO cases and deaths respectively. Malaria accounted for 37.2% of all maternal deaths in Sudan at

hospital level<sup>(2)</sup>. It also contributes by 17.4–4.8% of all outpatient clinic visits; it leads to 9.6–36.3% of all hospital admissions and results in 10–15% of total deaths that occur at hospital level. Case fatality rate is ranging between 0.9 to 6.9%<sup>(3)</sup>. The enormous economical impact of malaria is a result of the reduction in the productivity among farmers, as calculated by lost working hours and days; a total of 8409 hours within 1579 days were lost as a direct result of malaria<sup>(4)</sup>. It costs an amount of US\$5.2 per case in Gezira State<sup>(5)</sup>.

The RBM Strategic Plan 2001 – 2010 for the Sudan has been developed aiming at halving malaria-associated mortality by 2010 and again by 2015<sup>(2)</sup>. Abuja Summit in 2000, agreed to reduce the burden of malaria in Africa<sup>(6)</sup>.

In Sudan, dispensaries as part of the health system provide treatment services for the common communicable and non-communicable diseases. The care providers there are medical assistants and 1–2 nurses. Dispensaries form the bottom of

curative and preventive health system in Sudan, so they reflect the adoption and adherence to the national protocol for treatment of malaria in the whole system if positively found although the reverse is not true. White Nile State has high prevalence of malaria, and it was selected among the first states to implement the activities of RBM and testing the new protocol hence it may give hints to the status in other States.

The National Malaria Control Programme recommends the use of ACT as the safest and most effective treatment, this is in the form of the Artesunate plus Sulfadoxine-Pyrimethamine (AS+SP)", Artemether-lumefantrine and Quinine as the first, second and third lines treatment consequently with the dosage and regimens indicated<sup>(7)</sup>.

### Methods

*Study design and setting:* This is a descriptive, cross sectional, health facility based study. It took place in the White Nile State in the centre of the Sudan; its estimated area is 38,865 km<sup>2</sup>. It is consisted of 4 localities and 24 administrative units. The total population is about 1,600,000 of which 64% are rural, 33% urban and 3% are nomads. It has a long rainy season, up to 5 months; so there is huge burden of seasonal malaria. There are 30 hospitals, 66 health centers, 126 dispensaries and 68 PHC units. There are 2.6 consultants, 9.6 medical doctors, 1 pharmacist, 25.9 medical assistants, 51.3 nurses and 1.3 public health officers for every 100,000 people.

*Sampling:* The study population constitutes dispensaries, health care providers as well as patients diagnosed as having malaria at the time of the study. Multi-stage clustering sampling was followed. All the four localities in the state were included. Six administration units out of 24 were chosen randomly and 20 dispensaries were selected randomly and assigned to the selected

administrative units according to "probability proportional to size" approach. All care providers in the 20 dispensaries were targeted. All patients who were diagnosed as malaria cases were selected from each dispensary on the day of the visit to avoid bias that might occur on remaining for more than one day in the same dispensary. Data collectors shifted then to another dispensary till the proposed sample size in the cluster is reached. The process of shifting had been previously determined by giving random numbers to each dispensary within the administrative units and the shifting followed the order of numbers from one upwards. Patients had been interviewed after explaining the purpose of the study and taking his/her consent. This process took place in the period from 26<sup>th</sup> of September to 6<sup>th</sup> October 2005. Four teams each with two members had been trained on filling the modified WHO prescribing and dispensing indicators form, patient care form, the check list and the questionnaire. Four field supervisors, one in each locality also were selected and trained using the module described in the WHO manual. Then a pretest using the tools was carried out in 4 dispensaries from the unselected administrative units. The recommended prescribing and dispensing indicators forms which are recommended by WHO are not applicable at this level of health facilities because there are no dispensing services and the one who prescribes usually is the dispenser and in most times delivers the medications without written prescriptions. These facts necessitated the modification of those forms

### Results

A total of 734 patients and 20 care providers were interviewed in the 20 dispensaries. The majority of care providers were over 40 years old. Of them 90% (18) were medical assistants and the other 2 were trained nurses. Children under 5 years

represented 16.8% (123) and those between 5–15 years old were 39.8% (292). Malaria at the selected dispensaries was diagnosed on the bases of clinical presentation in 75% (15) and based on clinical presentation and microscopy in the rest (5). Antimalarial drugs were available at the dispensaries with various degrees. Health workers preference to injectable form reaches up to 45%. The private sector is the source of the drugs in 17 dispensaries (83%) – Table 1.

**Table 1: availability, formulae and source of antimalarial**

Variables	Freq	%
- Availability of antimalarial drugs		
o Chloroquine (CQ)	18	90
o SP	14	70
o Quinine	12	60
o Artemether inj.	05	25
o Coartem	00	00
o AS+SP	07	35
- Formulae preferred by care providers		
o Injectable	09	45
o Oral	11	55
- Source of antimalarial drugs		
o Private	17	85
o Revolving Drug Fund	03	15

(n=20)

Only 50% of health workers know that the first line recommended for treatment of malaria is (AS+SP). Still 45% use CQ as a first-line, that may be because only 2 health workers were trained on the new treatment protocol and that the protocol was found in poster form in only 4 dispensaries as shown in table 2.

**Table 2: Knowledge and use of the new treatment protocol among Health workers (n=20)**

Variables	Freq	%
- Recommended 1 <sup>st</sup> line according to new treatment protocol		
o AS + SP	10	50
o CQ	9	45
o Quinine	1	5
- Health workers trained		
o Yes	2	10
o No	18	90
- New Treatment protocol available as poster		
o Yes	4	20
o No	16	80
- Reasons for not using the protocol		
o Not trained	9	45
o Drugs not available	4	20
o Both	6	30

Antimalarial drugs were prescribed with antibiotics in 51.4% of patients (377) and more than 60%

receiving injectable form. Different reasons were given for high using rate of injectable form by health workers, these include patient preference, compliance and cost. Almost more than 50% of the patients classified as having prescription of two or more drugs with only 43.9% know the right dose (table 3)

**Table 3: Drugs prescribed at dispensaries**

Variables	Freq	%
- Drugs prescribed (n=733)		
o Antimalarials + antibiotics	377	51.4
o Injectable antimalarial	446	60.8
- Reasons for using injectable form more than oral (n=20)		
o Patient compliance	4	20.0
o Patient compliance + cost	6	30.0
o Cost	2	10.0
o Cost + tolerance	1	05.0
o Tolerance	7	35.0
- Classification of patient according to No. of drugs prescribed (n=73)		
o One	381	52.0
o Two	286	39.0
o > 2 drugs	66	9.0
- Classification of patient according to No. of drugs dispersed (n=733)		
o One	395	53.9
o Two	271	31.9
o > 2 drugs	67	9.2
- Patient knew the right dose (n=733)		
o Yes	322	43.9
o No	411	56.1

### Discussion

Half of the health workers lie in the age group 40 to 49 years which means that they have more than 10 to 20 years before retiring, so training could be cost-effective. The fact that the majority of them are medical assistants and the rest are trained nurses, may make it easier to hold unified training without modification for different groups.

Symptoms are used by the health workers as the main tool to diagnose malaria on their practice, this could be due to scarcity of resources for laboratory diagnosis on one hand; on the other hand when this service is available many patients cannot pay for it. Percentage of health workers prefer injectable formulae over oral preparations in this study, is higher when compared to 17.1% - 33.5% in Yemen<sup>(8)</sup> and 44.7% in Gezira State<sup>(9)</sup>. Reasons for such high rate as stated by health workers are; injectable preparations are more tolerable than oral

forms, they are better for ensuring compliance, and some workers think that only the less cost affects choosing such formulae. Younger patients received injectable medications more frequent than their older counter parts. Health workers believe that this will ensures compliance and much easier to be administered than the oral preparations for young children.

The most frequent antimalarial drug found in the dispensaries was chloroquine, a similar finding was shown in Nigerian villages health units<sup>(10)</sup>, followed by SP and then quinine, artesunate+SP was available in minority of dispensaries while none have had coartem in the stock. This shows that health workers in the dispensaries of the State are still fixed to the old protocol, either due to insufficient training or high cost Artemisinin based drugs that patients can not afford.

Health workers tend to prescribe one or two drugs rather than prescribing more. This may be due to economical factors despite the international policy to use combination therapy to avoid resistance. Anyhow, there is no relationship between detection of fever as a symptom and the number of drugs prescribed. On the other hand, there is slight difference between the numbers of drugs prescribed and those actually dispensed; this could be due to inability of patients to buy the items. From another point of view similar figures drugs prescribed and dispensed could be due to the fact that health workers in those dispensaries are responsible for both activities, therefore they prescribe what is available in the health unit.

Among those who were examined clinically, some were asked to do blood film investigation for malaria (25%); this may be an all or non phenomenon where those health workers who are adherent to the protocol tend to follow the whole recommended steps. Compared to 46% in Zambia<sup>(11)</sup> and 21.1% in Hajjah in Yemen<sup>8</sup>, this

reflect the insufficiency of the laboratory services in those dispensaries necessary to conduct microscopic examination and thence health workers there depend largely on clinical diagnosis.

More than half of patients who were diagnosed as having malaria received a combination of antimalarial drugs and antibiotics, a phenomenon which may reflect the hesitancy about diagnosis at those health units due to poor diagnostic tools both clinical and laboratory. These results are higher than those obtained from Gezira State where only 18.3% of cases received such combination<sup>9</sup>; this is statistically higher for children less than 15 years because of coexistence of bacterial infections.

Most of the patients who know the right dose of their medications prescribed are old when compared to the younger age groups. The low level of knowing the right dose among patients studied may be due to the fact that the health worker who is resident in those small villages is usually responsible for administration of doses specially the injectable.

Only half of health workers know recommended drugs to treat malaria, this may show the gap in understanding and adherence to the new protocol when realizing that 90% of health workers have heard about it but only one tenth of them were trained on it. A study in Nigeria showed that only 20% of health workers in villages had received training on malaria management guidelines<sup>(10)</sup>.

Dispensaries receive their drug supply mainly from the private market as a loan, which, they have to pay it back usually on monthly bases. This fact may explain the tendency of health workers in those dispensaries to provide cheaper drugs that patients can afford and hence avoid drugs such as Artemisinin based combinations. This also explains the weak adherence of those workers to the protocol. Only 20 % of the dispensaries have the poster of the new protocol for malaria management.

This was considered high at dispensaries level if compared with other countries<sup>(12)</sup>. From this study, we can conclude that, there is still a gap between the health policy at the central levels and the actual practices at the bottom of the health system.

Health workers are still fixed to the older protocol with the chloroquine being the most prescribed and available antimalarial drug in the dispensaries. Most of the health workers haven't been trained on the new protocol and they face difficulty in providing the ACTs drugs as their main route of supply is through the private pharmacy with a huge economical burden on them.

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