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Original Article

The rationality of anti-malarial drug prescriptions and its conformity with the National Protocol for treatment of Malaria in Wad Medani, Sudan

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ABSTRACT

This study was conducted at Wad Medani, Gezira State, Sudan in February 2010, to determine the pattern of anti malarial drugs prescriptions and to test their conformity to the National Protocol for treatment of Malaria. One hundred sixty prescriptions were collected and reviewed. The majority of prescription (95.6%) was written by house officers and medical officers. The most common anti- malarial drug prescribed was "Artesunate 100 mg and Sulfadoxine 500 mg –Pyrimethamine 25 mg" combination (75%), followed by Quinine injections (15.6%), Artmether injections (5.6%), Lumefantrine and artemether combination (1.9%) and Quinine tablets (1.9%). This study revealed that although most of the prescriptions conform to the National Protocol for treatment of Malaria, regarding the first line therapy of uncomplicated malaria, but most prescriptions were irrational (61.2%).

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Key words: Anti-malarial prescription, Rational drug use.

INTRODUCTION

Malaria is the most important parasitic disease of human, with a global incidence of 450-500 million cases and 1-2 million deaths per year. Malaria is the main epidemic disease in many parts of Africa, which account for approximately 90% of malaria cases in the world [1]. Malaria is an endemic disease in Sudan and it is a major public health problem, it is a leading cause of morbidity and mortality, resulting in an estimated 7.5 million cases and 35000 deaths annually. It represents 30% of all attendants to health facilities and a common cause of death in hospital [2].

Gezira State is one of the most productive states in Sudan, with an area of 35,304 km and population of 4 millions, 75% of them are rural and 60% of the area is irrigated. The State is made up of seven localities, which are divided into administrative units. Wad Madani is the capital of the state, located at the west bank of the Blue Nile River, 187 Km south of Khartoum [3]. Malaria constitutes a major health problem, causing serious disease, mainly in children and pregnant ladies. The predominate species is *plasmodium falciparum* (95%) and the main vector for transmission is *Anopheles arabiensis*. The transmission is seasonal and coincides with rain fall except irrigated schemes and along the Blue Nile bank where a longer transmission is found. Its prevalence is increased by many factors that include rapid spreading of resistance to anti malarial drugs, resistance to insecticides, climatic changes, poor community participation, and substantial extension in agriculture and population movement. The high morbidity and mortality among children is produced from interplay of malaria infection, malnutrition and schistisomasis, which are common in Gezira [2].

Several classes of anti malarial drugs are available in Sudan, previously chloroquine (CQ) was very effective as first line therapy for malaria treatment, but due to the widespread resistance it was withdrawn and replaced by Artemesinin based combination (ACT), that is include Artesunate (AS) and Sluphadoxine – Pyrimethamine (SP), to conform to the National Malaria Control Programme (NMCP) recommendations for treatment of malaria which expected to reduce the incidence of malaria and delay the development of resistance to drugs used in combinations. The National Malaria Control Program (NMCP) recommends to use (ACT) as the first line treatment for uncomplicated malaria. The second line treatment is "Artemether – Lumefantrine "oral tablets. The third line treatment is Quinine oral tablets. Quinine or Artemether injections are recommended for treatment of severe malaria [4-5].

The main objective of this study is to determine the patterns of prescriptions of anti malarial drugs in Wad Medani Health Facilities, and to assess the rational prescribing of anti malarials by the medical doctors.

METHODS

This research was conducted in Wad Medani Town, where malaria is stratified as mesoendemic to hyperendemic with unstable transmission pattern. A total of 160 prescriptions were collected and reviewed from 4 random pharmacies, during the 20 to 28 of February, 2010, this period is considered by researchers and physicians to be the low season for malaria infection in Gezira State. A checklist was filled to assess the conformity of the prescriptions to the National Protocol standards of drugs dosages, frequency of administrations and duration of dosages.

RESULTS

All 160 prescriptions collected and analyzed were for anti-malarial drugs. 6 prescriptions (3.8 %) were combined with antibiotics. 1 prescription (0.6 %) was combined with analgesics. (50.6 %) prescriptions were prescribed for male patients. (95.6 %) were for adults and only (4.4 %) for children, this is because most prescriptions were collected at Wad Madani Teaching Hospital (WMTH) which is for adults. (95.6 %) were written by the house-officers and medical officers, while (4.4 %) were written by consultants as shown in table (1):

The most common anti-malarial drug prescribed was AS + SP combination (75%), as shown in Figure (1). Prescriptions of Quinine injections were 25 (15.6 %), while prescriptions for Artemether injections were 9 (5.6 %). Coartem (Artemether and Lumefantrine combination) and Quinine tablets prescriptions attained same frequency and percentage of 3 (1.9%).

Regarding the type of inconformity to the recommended guidelines, the study revealed the fact that 111 (69.4 %) of prescriptions were not complying with the stated strength, while 85 (51.2%) were not conforming to the recommended dose. The details per each drug were shown in table (2)

Table (1): Anti-malarial drugs prescribed by the different health providers

The Anti-malarial drug	House-officers& Medical -officers	Specialists
AS+SP	98.3%	1.7%
Quinine injection	100%	0%
Artemethre injection	55.5%	44.5%
Aremether+ Lumefantrine	66.6%	33.4%
Quinine tablet	100%	0%
Total	**95.6%**	**4.4%**

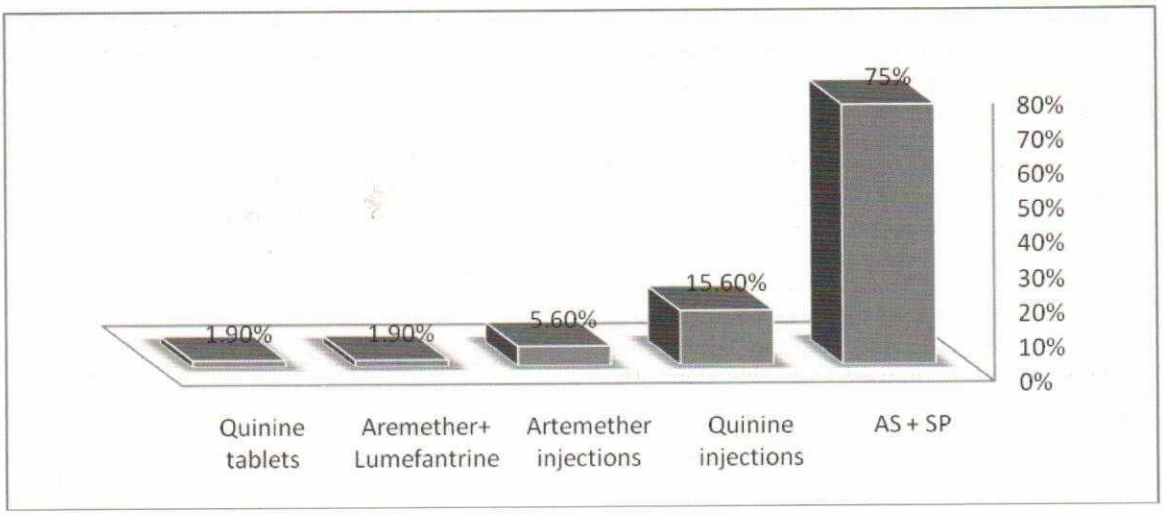

Figure (1): Percentage of anti-malarial drug prescriptions

Table (2): Rationality of prescriptions of anti-malarial drugs

Anti malarial drug	Strengths		Dose	
	Mention %	Not Mention %	Correct %	Not Correct %
AS+SP	21.7	78.3	55.8	44.2
Quinine injection	56	44	0	100
Artmether injection	66.6	33.4	55.5	44.5
Coartem	100	0	100	0
Quinine tabs	0	100	0	100
Total	**30.6**	**69.4**	**46.8**	**51.2**

DISCUSSION

The analysis of the prescriptions revealed that the majority of prescriptions (95.6 %) were written by house-officers and medical officers , this can be explained by the fact that most of the prescriptions (81.2%) were collected from WMTH Internal Pharmacy, located at the outpatient clinic which is covered by house-officers and medical officers, as well as the type of treated malaria since the most treated cases were simple and uncomplicated malaria that normally tackled by house officers, while the referred cases were treated by consultants.

More than 60% of the screened antimalarial prescriptions in this study showed a high rate of prescribing irrationality. AS+SP combination is the most commonly prescribed anti-malarial drug (75 %). Most of AS + SP prescriptions were irrational (58.8 %), being written as Artesunate without mentioning of its strength or SP component. This indicates that although health providers adhere to the national protocol for treatment of malaria, regarding the first line therapy for uncomplicated malaria, but their prescriptions were mostly written irrational. Similar results obtained by M.E.A. Yousif and S. A. Abd Elrazig [6].

A quinine injection, used for treatment of severe malaria, is the second prescribed anti-malarial drug (15.6 %). All were written in one or two doses only, this may be explained by the possibility that patients get their medication on daily basis .This may have a serious consequences as the patients may show some improvement after the first few doses and may not complete the total dose of Quinine for 7 days, in this case the symptoms of malaria may recur and patient condition deteriorates and

this may contribute to the development of resistance to this effective drug. Artemether injections, used for treatment of severe malaria, represented (5.6 %) of all prescriptions collected. A similar early study in Wad Medani, done by Mirghani et al, found that Artemether injections were the commonly prescribed anti-malarial drug (51.1%). Most of Artemether injections prescriptions (55%) were rational.[7]

The prescriptions of Coartem (Artemether - Lumefantrine combination), the second line therapy for treatment of uncomplicated malaria, were (1.9 %), and all prescriptions (100 %) were rational. Quinine tablets, the third line therapy for uncomplicated malaria, is the least prescribed anti-malarial drug (1.9 %). All were written in low dosage.

The least number of prescriptions for Coartem and Quinine tablets probably indicates that the health providers comply with the NP for treatment of malaria and the first line therapy, AS+SP combination, is still effective and the malaria parasite is sensitive to it.

The limitations of this study were the few numbers of pharmacy samples included and most prescription samples obtained from governmental hospital pharmacy which may not reflect exactly the situation in private community pharmacy.

CONCLUSION

This study showed that health providers were adhered to the national protocol for treatment of malaria regarding the first line therapy but in irrational manner, which may enhance the development of resistance and treatment failure. Efforts are needed to train and update the knowledge of the health providers, in the guidelines of the national protocol for treatment of malaria, and introduction of rational prescribing in the curricula of medical schools.

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