Antimalarial Drugs Prescribing in Dar es Salaam

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A retrospective survey of antimalarial prescribing by health care providers was carried out in four dispensaries to investigate three important parameters namely: commonly prescribed antimalarials, laboratory identification for malarial parasites and weighing patients prior to antimalarial prescribing by health providers. The study revealed that 70% of the patients had received chloroquine while 30% received other antimalarial drugs such as sulphalene/pyrimethamine (metakelfin), sulphadoxine/pyrimethamine (fansidar), quinine, and a combination of chloroquine and co-trimoxazole. The most preferred mode of administration for chloroquine was the intramuscular route (86%) and oral (14%). For quinine the intramuscular route accounted for 65%, slow intravenous infusion (16%) and oral (19%). Treatment of 80% cases were based on laboratory parasite identification and 20% were based on clinical diagnosis. It was also indicated that, when weight was used as a basis for dosage regimens of chloroquine, 9% of all the patients received the correct dose, 16% were overdosed, while 75% were under-dosed. The correlation coefficient between doses and body weights was poor for weights above 60 kg. There was a statistically significant association between the laboratory parasite identification and prescribing of antimalarial drugs.

Key words: antimalarials, prescribing, dosage.

INTRODUCTION

Malaria is caused by protozoan parasites that belong to the genus *Plasmodium*. It is a public problem in many developing countries including Tanzania. *Plasmodium falciparum* is of much interest because it causes life threatening acute attack of malaria and there are many reports of resistance to most classes of antimalarial drugs [1]. Globally mortality rate resulting from malaria stand at about 1.5 - 2.7 million persons every year and about 40% of the world's population is currently at risk of being infected [2,3]. Malaria is considered a priority disease by the World Health Organization (WHO) and is one of the six targeted diseases. In Africa, malaria is responsible for about 30-50% of fever cases, 30% of outpatient consultations and 10 - 15% of hospital admissions [2]. Malaria ranks high as a cause of morbidity and mortality in Tanzania with more than 100,000 deaths every year [4]. Hospital based reports show that 19-25% of outpatient attendances are due to malaria. This is probably an under-estimation due to poor reporting system. There are basically two measures of controlling malaria and these include both preventive and curative approaches [5]. The curative measure is based on use of antimalarial drugs.

The on-going economic reforms in Tanzania allowed free importation of drugs from abroad. There is the possibility of irrational use of antimalarial drugs and consequently drug resistance [6]. Chloroquine is among the commonly used antimalarial drugs and resistance to some species of Plasmodia has been reported [7].

Other factors that are likely to lead to drug resistance include under dosage of drugs and wrong clinical diagnosis [7,8]. The aim of this study was to investigate the diagnostic criteria used in prescribing antimalarial drugs by health providers in four private dispensaries. Other objectives included identification of preferred drugs and use of body weight as a basis for prescribing chloroquine.

MATERIALS AND METHODS

A retrospective study was carried out in four private dispensaries located in different parts of Dar es salaam to ascertain the practice of prescribing of different antimalarial drugs available in the market. The study covered the period 1st February to 31st May 1996. Patients' treatment cards kept at the reception were the only source of information.

A total of 713 outpatient records were randomly selected for the study. The information obtained included names of antimalarial drugs prescribed, sex, body weight, route of administration and basis of diagnosis.

RESULTS

Chloroquine, quinine, sulphalene/pyrimethamine, sulphadoxine/pyrimethamine and co-trimoxazole were among the commonly prescribed antimalarial drugs.

Out of 713 patients studied 381(53%) were males and 332(47%) were females.

Studies on laboratory identification for malaria parasites indicated that 571 (80%) patients had received medication after malaria parasite identification. One hundred and forty two(20%) of the patients received treatment without parasite identification.

Table 1 shows the distribution of prescribed drugs. Out of 713 patients, 221 (31%) had received chloroquine alone and 256 (36%) received a combination of chloroquine and co-trimoxazole. Quinine accounted for 51 (7%) cases while sulphalene/pyrimethamine accounted for 49 (7%) cases. Only 14 (2%) patients were treated with sulphadoxine/pyrimethamine. Other rarely prescribed drugs such as halofantrine, tetracycline, artemisinin, primaquine and amodiaquine accounted for 93 (12%) cases.

The preferred routes of administration and drug regimens showed that intramuscular injection for chloroquine accounted for 429 (86%) and oral route for 71 (14%) patients. For quinine intramuscular route accounted for 52 (65%) intravenous injection, 13 (16%) and oral 15 (19%) cases.

Body weight (mean 63 kg) was another parameter used as an indicator for chloroquine dosages. WHO recommended dose for chloroquine is 25 mg/kg-body weight. This study excluded children under five years of age. It was shown that among 477 patients treated with chloroquine 43 (9%) received the correct dose, 358 (75%) received low doses and 76 (16%) received high doses. Prescribed chloroquine dose against body weight indicated a weak correlation (r = 0.44) as compared to the standard dose against body weight (r = 0.99).

TABLE 1: Distribution of Various Antimalarial Regimens (n=713)

Drug regimen	Frequency	%
Chloroquine	221	31
Quinine	51	36
Chloroquine/Co-trimoxazole	256	7
Quinine/Sulphadoxine/Pyrimentamine	29	4
Sulphalene/Pyrimethamine	49	7
Rarely prescribed drugs*	93	13

*Halofantrine, Tetracycline, Artemisinin, Primaquine, Amodiaquine

DISCUSSION

Several antimalarial drug regimens were encountered in this study. They included chloroquine, sulphalene/ pyrimethamine, quinine, paludrine, halofantrine, artemisinin, amodiaquine and a combination of chloroquine/co-trimoxazole. Of the 713 malaria cases studied 221 (31%) had received chloroquine and 256 (36%) had received a combination chloroquine/co-trimoxazole. When considered singly chloroquine still ranked highest because a total of 477 (67%) patients were treated with chloroquine either alone or in combination. Similar results were obtained in a study that was carried out at the ante natal clinic at Muhimbili Medical Centre, in Dar es salaam. Among different antimalarial drugs used for prophylaxis by pregnant women chloroquine ranged high [10]. Despite the fact that chloroquine -resistant falciparum malaria has been reported, chloroquine is still widely used for treatment and chemoprophylaxis of malaria because of its low cost and low case of side effects, but also due to maintained clinical efficacy in semi-immunes [11,12]. Furthermore it was established that oral route was the mostly preferred mode of administration for many antimalarial drugs with exception of chloroquine and quinine. The parenteral route was found to be the mostly preferred mode for chloroquine and quinine administration. It was noted that patients on chloroquine therapy 410 (86%) received the drug through parenteral route while 67 (14%) received it orally. Parenteral administration of chloroquine should be discouraged for routine use due to the possibilities of under dosing it especially when not given according to the body weight. Parenteral administration should be instituted to seriously ill and vomiting patients who cannot swallow anything and should be given in adequate doses. Low levels of chloroquine in blood may play an important role in development of resistance [13]. Quinine is also one of the drugs often used in treating malaria in many African countries including Tanzania because resistance has not been encountered.

Unfortunately, quinine does not kill circulating parasites which remain available and sequester in deep structures, possibly worsening the outcome [9]. In this study 52 (65%) patients were given quinine by intramuscular route, 15 (19%) were given by intravenous infusion and 13 (16%) were given orally. Proper diagnosis is essential for malaria containment. And it should be emphasized that treatment of malaria without parasite identification is irrational prescribing practice and can as well lead to drug resistance [10]. However in this study, parasite identification was highly emphasized ($p<0.0011$). And when body weight was used as an indicator for chloroquine dosage regimens, 43 (9%) of the patients had received correct doses, 358 (75%) had received inadequate doses (underdose), and 76 (16%) had received higher doses (overdose). The correlation coefficient (r) between doses administered and body weights was 0.44 indicating that there was weak association between those two parameters especially for patients of body weight above 60 kg. Thus it indicates lack of drug compliance that could mistakenly be reported as resistance and encourages selective pressure in favour of falciparum resistant strains.

CONCLUSION

This study revealed that, health providers in private dispensaries in Dar es salaam prescribe chloroquine as a drug of choice for malaria treatment and oral route is the mostly preferred mode of administration to majority of the antimalarial drugs available. Laboratory identification of the malaria parasite was highly emphasized. However it has been noted that chloroquine was not given according to body weight. The seventy five percent under-dose cases suggest that body weight as indicator to prescribing chloroquine is not emphasized We speculate that if this practice continues it might result in an increase of the falciparum resistant strains. There is a need to educate health providers as well as the community as a whole on the importance of using chloroquine according to body weight.

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