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Research Article

ANALYSIS OF PRESCRIPTION PATTERN OF ANTIMALARIALS AND ITS COST IN MALARIA AT A TEACHING HOSPITAL

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ABSTRACT

Malaria is a major public health problem in India, accounting for sizeable morbidity, mortality and economic loss. Apart from preventive measures, early diagnosis and complete treatment are the important modalities that have been adopted to contain the disease. The aim of the study was to analyze the prescription pattern and cost of antimalarials in malaria. The study was conducted on 148 patients, diagnosed with malaria for a period of 8 months. The prescription pattern analysis was done by collecting the details of patient's data from the case sheets and laboratory reports. The cost of the antimalarials prescribed was analyzed by using price list from pharmacy. The study result showed that prevalence of malaria was more in males and in the age group of 18-30 years, most of the cases were reported from rural areas. The *P.vivax* was responsible for most of the malaria cases, out of 148 prescriptions most preferred antimalarial was artesunate and least preferred was artesunate +pyrimethamine+sulfadoxin combination therapy. In majority of the patients monotherapy was preferred over the combination therapy, the cost analysis reveals that the prescribers have least concern about the cost of the therapy. The study calculated that there is a need to bring the awareness among the prescribers regarding rational use of drug therapy and encourage them to follow the standard treatment guidelines, in this regard the intervention of clinical pharmacist can play very important role.

Key words: Antimalarials, malaria, prescription, cost

INTRODUCTION

Malaria is a hematoprotozoan parasitic infection transmitted by certain species of anopheline mosquitoes.[1] Malaria epidemic has repeatedly become one of the serious public health problems in many countries since the late 1980's mainly due to climatic change[2] and other factors related to changes in land use, drug resistance, migration of non-immune people, inadequate health facilities.[3,4] Malaria was previously considered as a major public health threat to people living in lowland areas of the country.[5]

In recent years, however, the disease has been expanding its extensive geographic coverage, and is increasingly recognized as a major health problem in midlands (temperate) and even in some highland areas of the country.[6] In addition, non-immune people living in highland areas frequently move to malaria endemic areas for various purposes such as settlement, search for fertile lands, seasonal migration

of pastoralists, and those seeking job opportunities.[7,8] India reported the highest number of malaria cases in the South-East Region and the second highest number of deaths due to malaria. Each year approximately 2.5 million cases and 4,000 deaths are reported.[9]

Prescribing practices can be defined as the ability of health professionals to differentiate and discriminate among the various choices of drugs and to determine the need of therapy will be most beneficial to their patient.[10] Prescription practices have been shown to influence the emergence of resistance to Antimalarial drugs. To prevent the emergence of resistant malaria parasites, drug use patterns can be evaluated in terms of prescribing and dispensing practices as well as patients' use of the drug.[11]

The World Health Organization (WHO) has recommended anti-malarial treatment guidelines. The correct use of antimalarial drug is the key not only to therapeutic success but also to deterring the spread of drug resistance malarial. Most cases of malaria are treated based on the clinical symptoms within the community and it is unavoidable that some patients will receive treatment irrationally. In order to develop rational policies concerning drug-use pattern, information must be in the perceptive of both dispensers as well as the consumers. Informal use of antimalarials could increase the risk of under-dosage, over-dosage or incorrect dosing, treatment failure, the resistance to antimalarial drugs, occurrence of adverse drug reaction and drug interactions which could impact negatively on antimalarial treatment safely.[12]

Medical audit improves the standards of medical treatment at all levels of health care delivery system. The study of prescribing pattern is a component of medical audit which seeks monitoring, evaluation and necessary modifications in the prescribing practices of the prescribers to achieve rational and cost effective medical care. It is necessary to define prescribing pattern and to identify the irrational prescribing habits to drive a remedial message to the prescribers.[13,14]

Keeping all facts in consideration the study entitled “Analysis of prescription pattern of antimalarials and its cost in malaria at a teaching hospital” was planned to analyze the pattern of drug use at Basaveshwar Teaching and General Hospital which will help to bring the necessary modification in the prescription practices, which in term helps in rational use of drugs and cost effective medical care.

OBJECTIVES

General objectives:

- To analyze prescription pattern of antimalarials and its cost in malaria.

Specific objectives: To assess

- The demographic data of patients.
- The type of malaria.
- Category of antimalarials used.
- Monotherapy or combination therapy.
- Most preferred and least preferred antimalarials.
- Cost of the antimalarials.

METHODOLOGY

Study site:

Study was conducted at Department of Medicine, HKES's Basaveshwar Teaching and General Hospital, Gulbarga. Which is a 765 bedded teaching hospital, and is a one of the largest hospital in Gulbarga.

Study duration:

The study was carried out for a period of eight months.

Study design:

The study was a prospective-observational study**.**

Study criteria:

The patients admitted to inpatient department at Department of medicine were enrolled in to the study by considering the following inclusion and exclusion criteria after taking consent from the Patients/ attendant of the patients.

Study criteria: The Study was carried out by considered following criteria:

Inclusion Criteria:

1. Patients diagnosed with Malaria.
2. Patients of above 18 years and of either sex.

Exclusion Criteria:

1. Patients who were not willing to participate in the study.

Source of data:

1. Case sheet of inpatients diagnosed with Malaria.
2. Lab data of inpatients diagnosed with malaria.

Study procedure:

Study was conducted at the Department of medicine. Patients diagnosed with malaria were enrolled in the study considering the inclusion and exclusion criteria. Informed consent was taken from each patient at the time of enrollment in to the study. Details regarding demography, disease and treatment were collected from the case sheets/lab reports of the patient in a specially designed patient data collection form.

The collected data was analysed by the following standard sources.

The analysis of prescribed antimalarials were carried out by using Text books, Internet, Micromedex, CIMS, MIMS, Drugs Today and other relevant sources.

The cost of the antimalarials prescribed was analyzed by using price list from pharmacy. The difference of cost between the brands of same antimalarials was noted.

Ethical Committee approval certificate

Prior to the study, Institutional Ethical Committee Clearance was obtained from the Mahadevappa Rampure Medical College (MRMC), GULBARGA.

RESULTS

A total of 148 malaria infected patients were enrolled into the study.

Table 1: Demographic data for all patients that participated in the study (n= 148)

Gender	**n = 148**
Male	93
Female	55
Age (years)	
18-30	65
31-40	28
41-50	20
51-60	18
61 and above	17
Region wise distribution	
Rural	105
Urban	43
Occupation	
Labour	53
Farmer	44
Business	22
Employee	16
Housewife	13
Education	
University	16
Pre-university	24
School	33
Illiterate	75
Habit of Smoking	
Smoker	12
Non Smoker	57

Table 2: Details of diagnosis of the patients

Sl. No	Diagnosis	No. of patients	Percentage
01	P. Vivax	89	60.14%
02	P. Falciparum	49	33.10%
03	Mixed malaria	10	06.76%

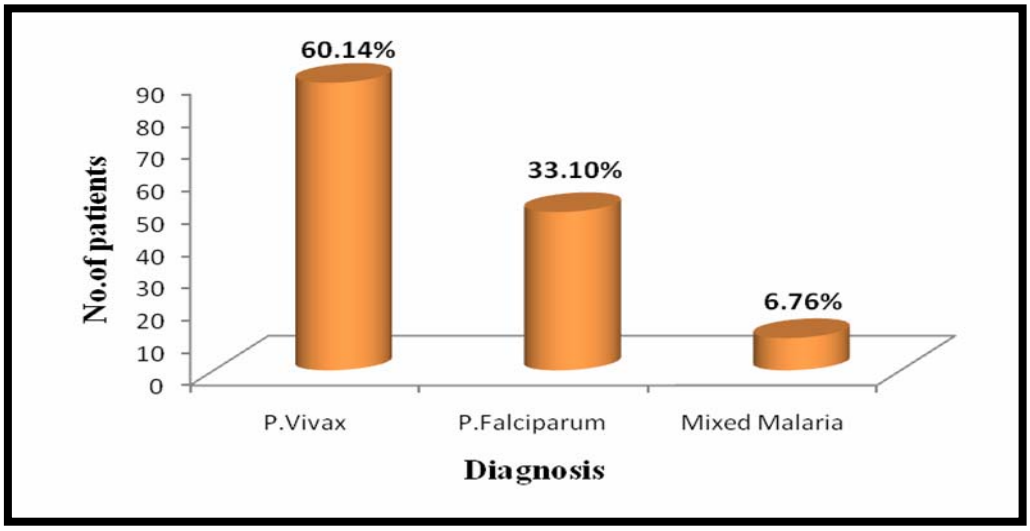

Figure 1: Details of diagnosis of the patients

Table 3: Details of type of therapy

Sl.no	Therapy	No. of patients	Percentage
01	Mono-therapy	115	77.71%
02	Combination therapy	33	22.29%

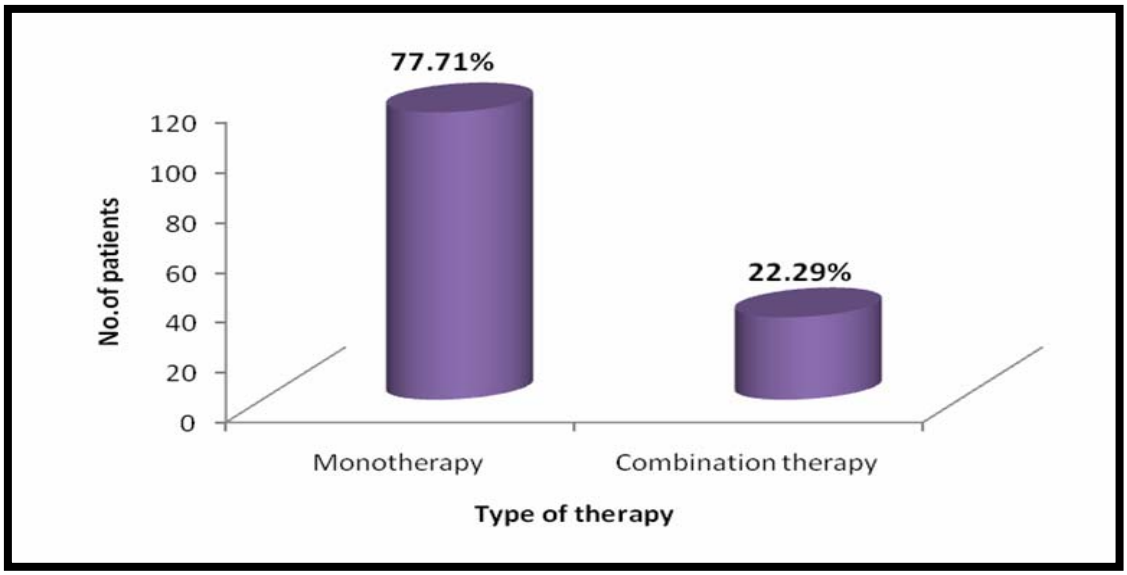

Figure 2: Details of type of therapy

Table 4: Details of prescribed antimalarials

Sl.No	Prescribed antimalarials	No.of prescriptions	Percentage
01	Artesunate	107	46.53%
02	Primaquine	54	23.47%
03	Chloroquine	42	18.26%
04	Artemether+Lumifantrine	12	5.21%
05	Quinine	08	3.48%
06	Pyrimethamine+Sulfadoxine	04	1.73%
07	Artesunate+Pyrimethamine+Sulfadoxine	03	1.30%

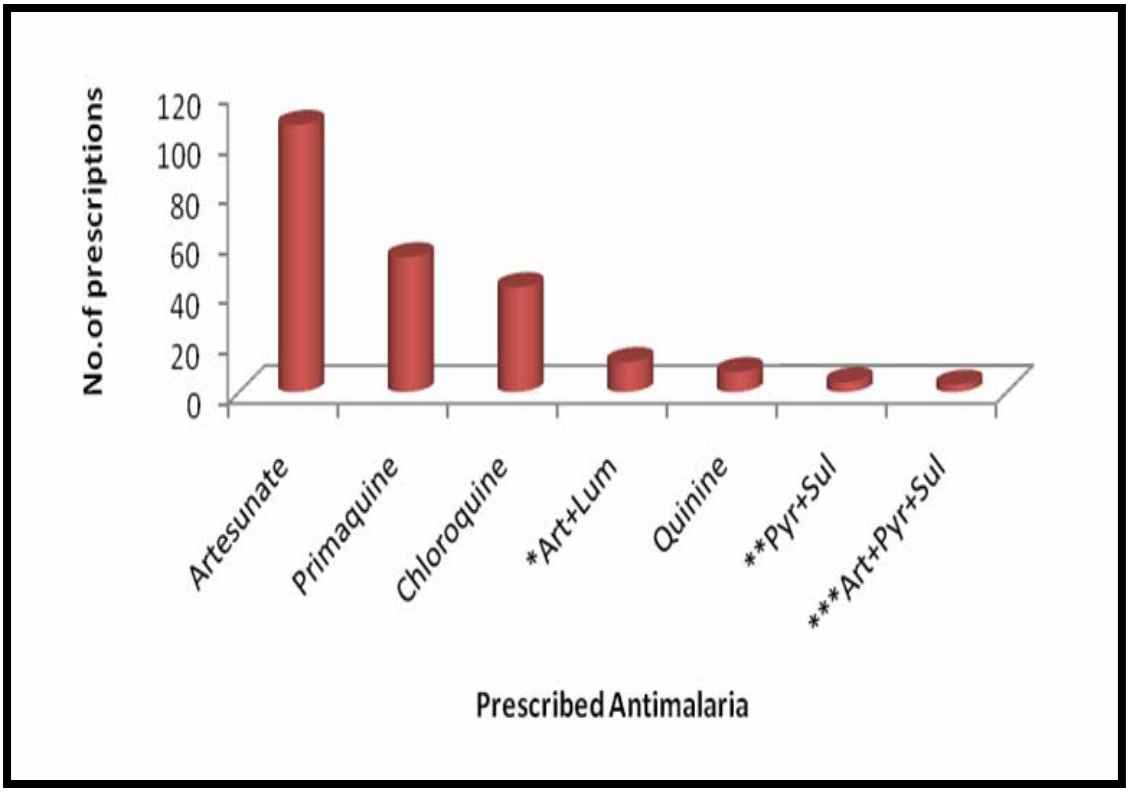

Figure 3: Details of prescribed antimalarials

Table 5: Details of cost difference between different brands of same antimalarial

Sl. no	Prescribed antimalarials	Dosage form	Highest cost/Unit (In rupees)	Lowest cost/unit (in rupees)	Difference Cost/unit (In rupees)	Difference In times
1	Artesunate (60mg)	Inj	225	140	85	1.60
2	Chloroquine (500mg)	Tab	1.21	1.07	0.14	1.13
3	Artemether (80mg)+Lumifantrine (480mg)	Tab	19.70	15	4.70	1.31
4	Premaquine (15mg)	Tab	4.28	2.45	1.83	1.74
5	Quinine(300mg)	Tab	8.00	5.00	3.00	1.6
6	Sulphadoxine (750mg)+Pyrimethamine (37.5mg)	Tab	3.42	3.33	0.9	1.02
7	Artesunate(200mg)+Sulphadoxine(750mg) + Pyrimethamine (37.5mg)	Tab	45	37.26	7.74	1.20

Condition of the patient at the time of discharge:

Out of 148 patients, 129 (87.16%) patients were improved, 17 (11.49%) were discharged under request and 02 (1.35%) patients were died.

Cost analysis of different brands of antimalarials

During the study period, different brands of the same antimalarial drugs were prescribed. Within the prescribed antimalarials, the maximum and minimum price of prescribed antimalarial regimen was analysed.

DISCUSSION

During the study period a total number of 148 patients were enrolled in to the study. Out of which 93(62.84%) patients were male and 55(37.16%) were female. The maximum cases were reported in males. As per region wise categorization, maximum number of patients 105 (70.95%) were from in the rural area, and least number of patients 43 (29.05%) were from urban area. The prevalence of malaria was more in rural area this may be due to lack of awareness about disease and not taking proper preventive measures.

According to occupation status of the patients, maximum numbers of cases were labours 53 (35.82%), followed by farmers 44 (29.72%) and least patients were house wives 13 (8.78%) .It may be due to labours and farmers generally live in a poor hygienic area and their economic and education level is also poor. At the study site, the more number of patients 89 (60.14%) were diagnosed as *Plasmodium vivax* followed by 49 patients (33.10%) as *Plasmodium falciparum* and least mixed malaria cases were 10 (6.76%).This may be due to *P.vivax* are more common in tropical regions and also they are more resistant to dry weather as compare with the *P.faciparum.*

Out of 148 patients, a total number of 230 antimalarials were prescribed. Among 230 antimalarials the maximum number of prescriptions were with artesunate 107(46.53%) followed by primaquine 54(23.47%), chloroquine 42(18.26%), artemether+lumifantrine 12(5.21%), quinine 8(3.48%), pyrimethamine+sulfadoxime 4(1.73%) and artesunate+pyrimethamine+sulfadoxime 3(1.30%). Among 148 patients the most preferred therapy was monotherapy. 115 (77.71%) followed by combination therapy. 33(22.29%) Out of 230 antimalarials prescribed, 224(97.40%) were prescribed with their brand name and 06(2.60%) were with generic name.

After analysing the difference of cost between brands of same antimalarials (highest to lowest), the maximum cost difference was 1.74 times and minimum cost difference was 1.02 times. It indicates that the prescribers are not much concerned about the cost of the antibiotics prescribed.

At the time of discharge the more number of patients were improved i.e.87.16%. Some patients were discharged under the request i.e.11.49% and death rate was 1.35%. During study period no patients were referred for higher centres.

CONCLUSION

Inappropriate use of antimalarial drugs undermines therapeutic efficacy and promotes the emergence and spread of drug-resistant malaria. Strategies for improving compliance require accurate information about current practices.

In our study the more number of malaria cases were found in the rural area and majority of patients were illiterate. Hence, there is need to educate the rural public, about hygienic life style. Thus health care providers should conduct the malaria awareness community programmes in the rural areas and educate the people.

At the study site, the majority of patients were diagnosed with *P.vivax.* This is due to the *P.vivax* parasites will survive in dry weather as compared to *P.falciparum*. Several studies shows that, most of the *P.falciparum* cases were found in Western Ghats of the India.

The most preferred therapy at the study site was monotherapy than combination therapy and most preferred drug regimen was artesunate parenteral therapy. As per WHO guidelines, ACT combination therapy should follow to treat malaria to minimize the drug resistance and which is also cost effective. As per the prescribed brands at the study site the cost of the antimalarial drugs varying from 1.02 to1.74 times. By this kind of prescribing practice, the patient has to pay more cost, Hence while prescribing the

drugs the prescriber has to prescribe cost effective drugs to reduce the cost of the treatment which reduces the financial burden on the patient.

At the study site the most of the patients treated with mono therapy, culture sensitivity test was nao carried in any of the patients, this may develop drug resistance. At the study site there is need to bring the awareness among the prescribers regarding rational (safe, effective & economic) drug therapy and encourage them to follow the standard treatment guidelines.

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