BioMedSciDirect Publications

Int J Biol Med Res
Volume 10, Issue 2, April 2019

International Journal of
BIOLOGICAL AND MEDICAL RESEARCH

PRESCRIPTION PATTERN IN ADMITTED MALARIA PATIENTS WITH RESPECT TO NATIONAL MALARIA GUIDELINES.

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A R T I C L E   I N F O

Keywords:

A B S T R A C T

Malaria is a disease caused by infection with single celled protozoan parasite of the genus plasmodium and five plasmodium species are known to infect humans- P. falciparum, P. vivax, P. ovale, P.knowlesi and P. malaria. Of these, majority of cases reported are due to infection with P. falciparum and P. vivax. P. falciparum is associated with the most severe form of the disease (1).

1. Introduction

The transmission of the malaria infection occurs via the bite of plasmodium-infected female anopheles mosquito. The infective form is sporozoite which passes through pre-erythrocyte phase in liver followed by erythrocytic phase in red blood cells (2).Malaria is one of the most prevalent and devastating diseases in the tropics. Inspite of considerable efforts throughout the century to eradicate or control malaria, it is still The most prevalent and most devastating disease in the tropics mainly due to poor therapy or Irrational drug use. . Evidence abounds on the improper use of anti-malarial drugs, such as the use of monotherapy and other less effective anti-malarial drugs, as well as inappropriate use of ACT (3). National malaria guidelines recommend treatment of malaria based on species and associated complications for better outcome. According to guidelines plasmodium vivax malaria is treated with chloroquine. Plasmodium falciparum, mixed malaria and complicated malaria is treated with artemisinin combination therapy(4).. The study focused on evaluating percentage of patients whose treatment is deviating from guidelines and to assess whether this deviation is associated with poor outcome.

Aims:-

1. To assess the percentage of patients whose treatment is deviating from national malaria treatment guidelines.
2. To assess whether this deviation is associated with poor outcome.

Methods:-

Study area:-Justice K S Hegde Charitable Hospital, Deralakatte, Mangalore.

Study Design

Retrospective study on prescription pattern of admitted malaria patients from 2013-2015 was carried out by random sampling.

Sample Size:- 210

Procedure:- Data about 210 admitted patients with malaria was collected from medical records department noting species, treatment, complications, duration for defervescence and duration of hospital stay during 2013-2015.

Statistical analysis

The statistical software Statistical package for Social Science (SPSS) version 16, was used to analyze the data. Quantitative variables were described using appropriate summary statistics (mean, median, standard deviation, and range); categorical variables are presented using frequency and proportions. Association between two categorical variables was assessed using independent t test . Data were analyzed at 5% significant level. Values of $p < 0.05$ were considered statistically significant.

Group Statistics

	group	N	Mean	Std. Deviation	Std. Error Mean
Defervesence-Day	1	169	2.2189	1.14148	.08781
	2	40	2.2250	1.16548	.18429
Hosp-stay Duration	1	169	5.3550	2.85221	.21940
	2	40	5.2250	1.76123	.27847

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Defervesence-Day	Equal variances assumed	.139	.709	-.030	207	.976
	Equal variances not assumed			-.030	58.025	.976
Hosp-stay Duration	Equal variances assumed	1.855	.175	.276	207	.783
	Equal variances not assumed			.367	94.033	.715

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TABLE 1

GENDER DISTRIBUTION-

Males	174(83%)
Females	36(17%)

Mean age of presentation is 34.

37(17.6%) were plasmodium falciparum, 30(14.2) were plasmodium vivax, 143(68.2%) were mixed malaria.

TABLE 2-
SPECIES DISTRIBUTION

FALCIPARUM	37(17.6%)
VIVAX	30(14.2%)
MIXED	143(68.2%)

40(19%) patients treatment was deviated from national guidelines, 170(81%) patients treatment was according to guidelines.

TABLE 3
TREATMENT

ACCORDING TO GUIDELINESS	170(81%)
DEVIATED FROM GUIDELINESS	40(19%)

Out of 37 patients of P.falciparum 6(16%) patient's treatment deviated from guidelines. According to guidelines Plasmodium falciparum patients should receive Artemisinin and long acting anti malarial. Deviation is mainly monotherapy.2 patients got chloroquine and remaining 4 patients got only artemisinin.

TABLE 4
6 DEVIATED FALCIPARUM CASES

CHLOROQUINE	2
ARTEMESININ	4

Out of 30 patients of Plasmodium vivax 15(50%) patients treatment deviated from guidelines. According to guidelines chloroquine is drug of choice. In this study 6 patient got artemether and lumefantrine ,4 patients got artesunate and chloroquine,2 patients got plain artesunate,1 got artesunate and doxycycline,1 got chloroquine and doxycyline

TABLE 5
15 DEVIATED VIVAX CASES

AM+LF	6
AS+CQ	4
AS	2
AS+DX	1
CQ+DX	1

19 of mixed malaria patients treatment is deviated from guidelines. ACT is treatment according to guidelines. All patients got monotherapy.

31 patients of plasmodium falciparum got treatment according to guidelines, 13(40%) patients got artemether+ lumefantrine combination, 11(36%)got artesunate+ doxycycline combination,6(20%)got artesunate + chloroquine ,1(3%) artesunate + sulfadoxine pyrimethamine.

TABLE 6
FALCIPARUM CASES TREATED ACCORDING TO GUIDELINESS

AM+LF	13(40%)
AS+DX	11(36%)
AS+CQ	6(20%)
AS+SP	1(3%)

15 patients of plasmodium vivax got treatment according to guidelines.12patients are complicated and 3 patients are uncomplicated.3 uncomplicated patients got chloroquine.

Out of these 12 complicated patients 7(58.3%) patients got artesunate plus doxycycline,4(33.3%) patients got artesunate plus chloroquine,1 (8.3%) got artemether plus lumefantrine combination.

TABLE 7

COMPLICATED VIVAX CASES TREATED ACCORDING TO GUIDELINESS

AS+DX	7(58.3%)
AS+CQ	4(33.3%)
AM+LF	1(8.3%)

Out of 143 mixed malaria patients 124 patients are treated according to guidelines,46(37%)cases got artemether+lumefantrine combination therapy,47(37.9%) got artesunate +doxycycline,26(21%)chloroquine+artesunate combination,3(2.4%) got artesunate+sulfadoxime pyrimethamine ,2 (1.6%)got chloroquine+doxycycline

TABLE 8

CORRECTLY TREATED MIXED MALARIA PATENTS

AM+LF	46(37.2%)
AS+DX	47(37.9%)
CQ+AS	26(21%)
AS+SP	3(2.4%)
CQ+DX	2 (1.6%)

Complications-total of 57 patients have complications.

16(53.3%) of plasmodium vivax patients, 37 (25.8%) of mixed malaria patients, 4 (10.8%) plasmodium falciparum are complicated.

TABLE 9

COMPLICATED CASES DISTRIBUTION ACCORDING TO SPECIES

MIXED	37 (25.8%)
VIVAX	16(53.3%)
FALCIPARUM	4 (10.8%)

most common complication is hepatitis which is seen in 16(28%)cases.13(22.8%)have acute kidney injury.10(17.5) patients have severe anemia.7(12%)patients have hepatitis plus acute kidney injury.4(7%) patients have cerebral malaria2 patients have ards,2 patients have shock.

TABLE 10

COMPLICATIONS OF MALARIA

HEPATITIS	16
ANEMIA	10
ARDS	2
AKI	13
CEREBRAL MALARIA	4
SHOCK	2
HEPATITIS+AKI	10

Mean duration of defervescence in patients whose treatment is deviated is 2.275 days and correctly treated patients in 1.95 days.

TABLE 11

MEAN DURATION OF DEFERVESCENCE

DEVIATED PATIENTS	2.275 days
CORRECTLY TREATED	1.95 days

Mean duration of hospital stay in patients whose treatment is deviated is 5.2 days and correctly treated patients is 4.2 days.

TABLE 12

MEAN DURATION OF HOSPITAL STAY

DEVIATED PATIENTS	5.2 DAYS
CORRECTLY TREATED	4.2 DAYS

Discussion-

Approximately 80% of India's population lives in malaria risk areas. Our area also comes under endemic region for Malaria as confirmed by the number of cases (n=210) reported during the one year study period. Kumar A et al., also found that in spite of a rise in malaria cases, India is making really slow progress regarding control of malaria in comparison to other countries. As suggested by higher number of cases found in our study. There are also other reasons for higher number of cases in our study as our hospital is closer to rural areas as compared to urban areas.

it is most commonly seen in males indicates a higher incidence of malaria infection among the males. The higher incidence among the male may be a mere reflection of the sex distribution in the study population or an indication of a stronger immunity developed by the females. Malaria is not known to be associated with any sex preference but several studies have reported a higher incidence in male(6,7). Mean age of occurrence is 34 years. A study in a teaching hospital in Nigeria where the drug prescribing pattern was assessed revealed that a high percentage of recorded malaria cases was reported in patients between 21 and 50 years of age(8) Most of the patients were found to be mixed malaria (plasmodium vivax and falciparum)..

In this study we found that the majority of antimalarial prescriptions in this hospital are according to national malaria guidelines.81 percent patients got treatment according to guidelines. chloroquine is first choice of drug for uncomplicated plasmodium vivax malaria.

In complicated plasmodium vivax most of patients got artemether + lumefantrin, artesunate +chloroquine combination, while few patients got artesunate+doxycyline,chloroquine+doxycycline tablets.

Half of the patients of plasmodium falciparum got artemether+lumefantrine combination therapy.36% patients got artesunate+doxycycline combination therapy.few patients got artesunate +chloroquine,artesunate+sp combination therapy. Very limited studies have been done on the drug utilization of falciparum malaria. In a study by Chedi BAZ et al (2010) it was seen that oral Chloroquine was prescribed to near about 25% patients and Artesunate and Sulfadoxine-Pyrimethamine combination was prescribed to 24%(9).

In a study by Faheem Mubeen et al (2012) it is seen that Artesunate and Sulfadoxine-Pyrimethamine were prescribed to 46.1% patients having single infection with Plasmodium falciparum.another interesting observation is that chloroquine is not prescribed to plasmodium falciparum case..a wide publicity generated that chloroquine was resistant to plasmodium falciparum accounted for this.To counter the threat of resistance of P. falciparum to

monotherapies, and to improve treatment outcome, combinations of antimalarials are now recommended by WHO for the treatment of falciparum malaria Two or more blood schizontocidal drugs with independent modes of action and thus unrelated biochemical targets in the parasite are used and at present Artemisinin Combinations (ACTs) are the recommended treatments for uncomplicated falciparum malaria. Most of mixed malaria patients got artemisinin combination therapy(10).

6 patients of plasmodium falciparum got treatment that is deviated from guidelines. According to guidelines, Plasmodium falciparum patients should receive Artemisinin and long acting anti malarial. Deviation is mainly monotherapy.2 patient's got chloroquine and remaining 4 patients got only artemisinin.

Out of 30 patients of Plasmodium vivax 15(50%) patients treatment deviated from guidelines. According to guidelines chloroquine is drug of choice. In this study 6 patient got artemether and lumefantrine ,4 patients got artesunate and chloroquine,2 patients got plain artesunate,1 got artesunate and doxycycline,1 got chloroquine and doxycyline

19 of mixed malaria patients treatment is deviated from guidelines. ACT is treatment according to guidelines. All patients got monotherapy.

Most common complication seen in patients with malaria is hepatitis in our study. The recent data percolating from different areas of India reflects adrastic change in favour of renal and hepatic involvement, whereas the predominant presentation earlier was with cerebral malaria(11). The exact cause of increased incidence of hepatic or renal injury is not known but may be due to selective involvement of these organ by a different strain of P.falciparum(12)

Mean duration of defervescence in patients whose treatment is deviated is 2.275 days and correctly treated patients in 1.95 days.

Mean duration of hospital stay in patients whose treatment is deviated is 5.2 days and correctly treated patients are 4.2 days. In another study, the median duration of survival after hospitalization was 3 days and majority of deaths due to severe malaria occurred in the first 48 hours of admission(13)

So according to this study mean duration of defervescence and hospital stay is more in patients whose treatment deviated from national malaria guidelines(p>0.05).though statistically not significant, prompting need for reinforcement of guidelines.

Conclusion:-

Most of patients got treatment according to guidelines. 19% of patients had treatment deviation from guidelines and they had prolonged duration for defervescence and hospital stay though statistically not significant, prompting need for reinforcement of guidelines. Most common malaria in this study is mixed malaria. Most common complication is hepatitis.

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