Original Research Article

Clinical profile and therapeutic outcome of falciparum malaria patients in a tertiary care hospital

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Abstract

Background: To study the clinical profile and therapeutic outcome of patients with Plasmodium falciparum malaria in a tertiary care hospital **Materials and methods:** A retrospective observational study was conducted in a tertiary care hospital to study the clinical presentation, diagnosis, treatment and therapeutic outcome of malaria caused by Plasmodium falciparum. Data of patients, diagnosed with P. falciparum malaria during a period of 3 years, was obtained from the medical records library. **Results**: Out of the 191 patients diagnosed with Falciparum malaria during the study period, 85.9% were males and the mean weight of the study population was 62 ±15kg. Highest incidence of malaria was seen within the age group 21-30 years (25.7%) and the majority of malaria cases were recorded from July to September during all these three years. Common presenting symptoms included fever (99%), vomiting (46.1%), and headache (35%) and jaundice (30.9%). 24% of the cases were diagnosed with severe malaria out of which 28% was due to cerebral malaria. While 16% of the total patients required transfusion due to grade 4 thrombocytopenia, severe anemia was reported in 9% of the study group. Artesunate based Combination Therapy (ACT) was the preferred anti malarial regimen which was given to 96% of the patients and only 3 patients on treatment with artemisinin derivatives showed treatment failure. Even though 54.5% of the patients complained of gastro intestinal adverse effects like gastritis, vomiting and diarrhea, anti malarial drug therapy was tolerated well by around 34% of the total patients. **Conclusion:** The study results will provide the much need fill up to anti-malarial studies which will help us to understand the clinical pattern and therapeutic outcome of the disease in a better way.

Key words: Plasmodium falciparum, Malaria, Anti-malarial drug therapy.

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INTRODUCTION

Malaria is an infectious disease caused by Plasmodia species namely, *Plasmodium vivax, P. falciparum, P. ovale, P. malariae* and *P. knowlesi* in humans and is transmitted by the female anopheles mosquito. Among these, Falciparum malaria is associated with higher morbidity and mortality.[1] Malaria is the fifth cause of death from infectious diseases worldwide and the second in Africa, after HIV/AIDS. *India, the country most affected by malaria in the South East Asian region* with an estimated 70-100 million cases each year*, is projected to see a decrease of 50-75 per cent in malaria case incidence by 2015.*[2,3] Anti-malarial combination therapy, especially Artemisinin based Combination Therapy (ACT), is currently regarded as a major strategy to combat drug-resistant Falciparum malaria. The combination of anti-malarial drugs ,with independent modes of action, targeting different stages in the life cycle of the parasite, enables rapid clinical response as well as delays the development of resistance.[4,5] The rapid spread of

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antimalarial drug resistance over the last few decades has increased the need for monitoring in order to ensure proper management of clinical cases. For early detection of changing patterns of resistance, repeated assessment of clinical and parasitological outcomes of treatment during a fixed period of follow-up time is essential to detect any reappearance of symptoms and signs of clinical malaria and/or parasites in the blood.[6] In this retrospective observational study, clinical features, complications, response to treatment and outcome of patients diagnosed with malaria were investigated in a tertiary care hospital. Change in sensitivity of parasite to the treatment given and adverse events with different antimalarial regimen were also analyzed.

MATERIALS AND METHODS

Study design: A retrospective observational study was conducted in the Department of Medicine, Kasturba hospital, Manipal to study the clinical presentation, diagnosis, treatment and outcome of P. falciparum malaria.

Study participants: After obtaining institutional ethics committee clearance, data of patients diagnosed and treated as P. falciparum malaria from January 2011 to December 2013 were obtained from case records in Medical records library.

Inclusion Criteria: All the cases tested positive for falciparum malaria (either by peripheral smear or rapid diagnostic test) and treated in the department of medicine in the age group of 12 years and above were included.

Exclusion Criteria: Patients presenting with fever who were treated empirically (malarial smear and rapid diagnostic test negative) for malaria were excluded.

Methods: Parasitological diagnosis was made by light microscopy and rapid diagnostic tests. As per WHO guidelines, severe falciparum malaria was diagnosed.[7-9] Efficacy of treatment regimen was measured in terms of number of days for: parasite clearance, defervescence and hospital stay. Toxicity was assessed by the adverse events in patients as per their clinical symptoms. Body temperature recorded six hourly was collected and defervescence days was defined as the time taken for the patient to become afebrile. The number of days patient stayed in hospital was also recorded. After treatment, patient was considered cured if he/she did not have fever or parasitemia till Day 28.

Resistance of parasite to the treatment given was assessed as follows:

Early treatment failure (ETF): Development of danger signs or severe malaria on Day 1, 2 or 3, in the presence of parasitaemia; parasitaemia on Day 2 higher than on Day 0, irrespective of axillary temperature; parasitaemia on Day 3with axillary temperature>37.5°C; and parasitaemia on Day 3>25% of count on Day 0.

Late clinical failure (LCF): Development of danger signs or severe malaria in the presence of parasitaemia on any day between Day 4and Day 28 in patients who did not previously meet any of the criteria of early treatment failure; andpresence of parasitaemia on any day between Day 4 and Day 28 with axillary temperature >37.5°C inpatients who did not meet of the criteria of early treatment failure. Treatment failure is defined as a failure to clear detectable parasites from the blood (R3, R2) or a subsequent recrudescence (R1).

Three levels of resistance as defined by WHO are:

Resistance 1(R1)-Following treatment, parasitemia clears but recrudescence occurs

Resistance 2(R2)- Following treatment there is a reduction but not a clearance of parasitemia

Resistance 3 (R3)- Following treatment,there is no reduction of parasitemia.

Ethical consideration: The study protocol was approved by institutional human ethical committee. Informed consent was obtained from all the participants prior to the study. Confidentiality of data was maintained.

Statistical analysis: Data was analyzed using SPSS 20.0. Data was expressed as frequency and percentages.

RESULTS

Out of the 191 patients diagnosed with Falciparum malaria during the study period, 85.9% were males and the mean weight of the study population was 62 ±15kg. Highest incidence of malaria was seen within the age group of 21-30 years (25.7%) and the majority of malaria cases were recorded from July to September during all these three years. Common presenting symptoms included fever (99%), vomiting (46.1%), headache (35%) and jaundice (30.9%). Around 24% of the cases were diagnosed with severe malaria (46 patients) out of which 28% (13 patients) were inflicted with cerebral malaria. While 16% of the total patients required transfusion due to grade 4 thrombocytopenia, severe anemia was reported in 9% of the study group. Artesunate based Combination Therapy (ACT) was the preferred anti malarial regimen which was given to 96% of the patients and only 3 patients on treatment with artemisinin derivatives showed treatment failure. Even though 54.5% of the patients complained of gastro intestinal adverse effects like gastritis, vomiting and diarrhea, anti malarial drug therapy was tolerated well by around 34% of the total patients. A total of 191 patients were admitted with diagnosis of falciparum malaria during the time period. Of which 85.9% were males and 14.1%were females. Majority of cases were from Udupi district (65.4%) followed by Devangere (9.4) and Shimoga (7.3). Mean age was 34.17 ±17.01 years. Highest incidence of malaria was seen with age group 21-30 years (25.7%). Majority of malaria cases were recorded during the time

period July to September all the three years. Almost 99% presented with fever of which 10.5% had altered consciousness and 4 patients presented with seizures. Evidence of pulmonary involvement was seen in 10.5% of patients and meningeal signs were seen in 3.1% of patients. Out of 191 patients 24.1% patients had severe malaria as per WHO guidelines.

Table 1: Criteria of patients

Criteria	Number of patients (%)
SEVERE MALARIA	46(24.1%)
Impaired consciousness (including cerebral malaria)	13(6.8%)
Clinical jaundice plus evidence of other vital organ dysfunction	34(17.8%)
Severe renal impairment (sr. creatinine >3 mg/dl)	19(9.9%)
Severe anemia (Hb<5 gm/dl)	17(8.9%)
Circulatory collapse or shock	12(6.3%)
ARDS	14(7.3%)

Table 2: Clinical symptoms of patients

Clinical symptoms	Number of patients (%)
Fever	189(99%)
Vomiting	88(46.1%)
Headache	86(45%)
Myalgia	51(26.7%)
Abdominal pain	32(16.8%)
Breathlessness	19(9.9%)
Altered consciousness	20(10.5%)
Loose motion	14(7.4%)
Cough	16(8.4%)
Hematuria	17(8.9%)
Oliguria	17(8.9%)
Abnormal bleeding	20(10.5%)
Seizure	4(2.1%)

Table 3: Clinical signs of patients

Clinical signs	Number of patients(%)
Icterus	59(30.9%)
Pallor	40(20.9%)
Splenomegaly	75(39.3%)
Hepatomegaly	69(36.1%)
Hepatosplenomegaly	45(23.6%)
Crackle	20(10.5%)
Metabolic acidosis	13(6.8%)
Pedal edema	13(7%)
Systolic BP <100 mg	19(9.9%)
Neck stiffness	6(3.1%)

Table 4: Lab findings of patients

Lab findings	Number of patients (%)
Anemia	76(39.7%)
Severe anemia	14(7.3%)
Thrombocytopenia	166(86.9%)
Grade 4 thrombocytopenia	31(16.2%)
Leucopenia	33(17.2%)
Leucocytosis	16(8.4%)
Pancytopenia	20(10.4%)
Hyponatremia	106(55.5%)
Hypokalemia	35(18.3%)
Hyperkalemia	9(4.7%)

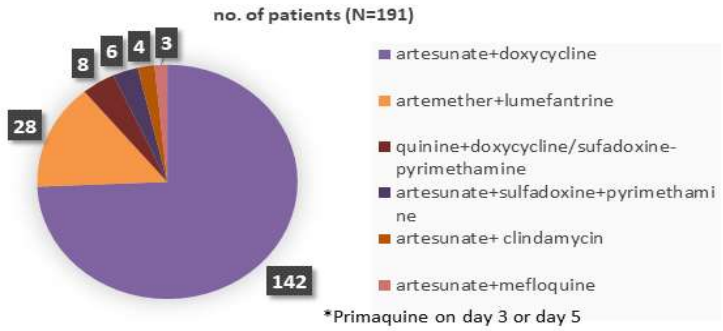

Figure 1: Treatment of patients

Table 5: Treatment failure of patients

	Treatment failure	Frequency
	Nil	186
	early treatment failure +resistance 3 artesunate +doxy	1
	late clinical failure/artesunate+doxy	2
	Early treatment failure Quinine	1
	Total	190
Missing	System	1
	Total	**191**

Table 6: Treatment failure of patients

Adverse drug reactions	Number of patients (%)
Gastritis	68(35.6%)
Headache	59(30.9%)
Anemia	35(18.3%)
Vomiting	27(14.1%)
Giddiness	13(6.8%)
Diarrhoea	09(4.7%)
Hypoglycemia	03(1.6%)
Rash	03(1.6%)
Thrombophlebitis	03(1.6%)
Visual disturbances	02(1%)
Constipation	01(0.5%)

DISCUSSION

In this retrospective observational study, clinical features, complications, response to treatment and outcome of patients diagnosed with malaria were investigated in a tertiary care hospital. Change in sensitivity of parasite to the treatment given and adverse events with different antimalarial regimen were also analyzed. Out of the 191 patients diagnosed with Falciparum malaria during the study period, 85.9% were males and the mean weight of the study population was 62 ±15kg. Highest incidence of malaria was seen within the age group of 21-30 years (25.7%) and the majority of malaria cases were recorded from July to September during all these three years. Common presenting symptoms included fever (99%), vomiting (46.1%), headache (35%) and jaundice (30.9%). Around 24% of the cases were diagnosed with severe malaria (46 patients) out of which 28% (13 patients) were inflicted with cerebral malaria. While 16% of the total patients required transfusion due to grade 4 thrombocytopenia, severe anemia was reported in 9% of the study group. Artesunate based Combination Therapy (ACT) was the preferred anti malarial regimen which was given to 96% of the patients and only 3 patients on treatment with artemisinin derivatives showed treatment failure. Even though 54.5% of the patients complained of gastro intestinal adverse effects like gastritis, vomiting and diarrhea, anti malarial drug therapy was tolerated well by around 34% of the total patients. A total of 191 patients were admitted with diagnosis of falciparum malaria during the time period. Of which 85.9% were males and 14.1%were females. Majority of cases were from Udupi district (65.4%) followed by Devangere (9.4) and Shimoga (7.3). Mean age was 34.17 ±17.01 years. Highest incidence of malaria was seen with age group 21-30 years (25.7%). Majority of malaria cases were recorded during the time

period July to September all the three years. Almost 99% presented with fever of which 10.5% had altered consciousness and 4 patients presented with seizures. Evidence of pulmonary involvement was seen in 10.5% of patients and meningeal signs were seen in 3.1% of patients. Out of 191 patients 24.1% patients had severe malaria as per WHO guidelines. The study results are in accordance with earlier studies.[10,11]

CONCLUSION

The study results will provide the much need fill up to anti-malarial studies which will help us to understand the clinical pattern and therapeutic outcome of the disease in a better way.

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