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Original Research Article

Clinical and biochemical profile of malaria: retrospective observational study from a tertiary centre

Kirankumar Meti, Rajendrakumar Parakh*, Kiran Aithal, Hemamalini G.

Department of General medicine SDM College of Medical Sciences and Hospital, Dharwad, Karnataka, India

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***Correspondence:**
Dr. Rajendrakumar Parakh,
E-mail: drrajendra80@gmail.com

ABSTRACT

Background: Malaria is one of the common causes of acute febrile illness in tropical countries. Malaria presents with varied manifestations. This retrospective study carried to know the clinical profile and laboratory abnormalities seen in malaria patients.
Methods: The data was collected retrospectively from 1st January to 31st December 2017. Inclusion criteria: all fever cases above 15 years of age of both the sexes diagnosed as malaria by peripheral smear examination and malaria card test. Exclusion criteria: combined malaria with other fevers such as dengue, chikangunya. Fever cases negative for malaria tests. Malaria cases with history of chronic kidney disease, chronic liver disease such as cirrhosis of liver, chronic viral hepatitis, liver abscess, and chronic illness such as rheumatoid arthritis, diabetes, and hypertension. The data regarding the clinical presentation of patients and laboratory values such as hemoglobin, total leukocytecount, platelet count, total bilirubin, SGOT, SGPT, albumin values collected and analyzed with tables and percentage.
Results: A total of 57 malaria cases were analyzed, 71.9 % males, 28.1% were females. The commonest age group was between 15- 30 years (61.4%). 29 patients (50.9%) had *P. vivax*, 20 patients (35.1%) *P. falciparum* and 8 patients (14%) mixed infection. The most common clinical presentation was fever with chills (100%) followed by vomiting (68.4%), splenomegaly (56.1%), headache (45.6%), pain abdomen (43.9%).19 cases (33.3%) had hemoglobin less than 10gm/dl; 42 cases (73.6%) had thrombocytopenia; 46 cases (80.7%) had urea ≥30mg/dl; 14 cases (24.6%) had creatinine ≥1.4; 26 cases (45.6%) had total bilirubin >1.2mg/dl ; 17 cases (29.8%) had SGOT >45 IU; 33 cases (57.9%) had SGPT > 45 IU and 32 cases (56.1%) had albumin level ≤3.5gm/dl.
Conclusions: In the study malaria due to *P. vivax* was more common than *P. falciparum*, malaria affected young adults, males more than females. Reduced hemoglobin and platelet count, deranged liver and renal function and reduced serum albumin seen commonly in malaria.

Keywords: Malaria, Platelet count, SGOT, SGPT

INTRODUCTION

Malaria is one of the common febrile illnesses seen in tropical countries. Malaria is a major public health problem in India and one which contributes significantly to the overall malaria burden in Southeast Asia. India contributes about 70% of malaria in the South East Asian Region of WHO. Although annually India reports about two million cases and 1000 deaths attributable to malaria, there is an increasing trend in the proportion of Plasmodium falciparum as the agent. In 2014, there were 2.14 million confirmed *P. vivax* cases globally, 18% of which occurred in India.[1] *Plasmodium vivax* accounts for approximately a third of all malaria cases in India. Although malaria control measures have had impacts on both *Plasmodium falciparum* and *P. vivax* malaria, in most states, the recent declines in malaria cases and mortality have been achieved predominantly through the

successful control of *P. falciparum*.[2] The clinical features of malaria vary from mild to severe, and complicated, according to the species of parasite present, the patient's state of immunity, the intensity of infection and also the presence of concomitant conditions such as malnutrition and other diseases. Malaria parasite affects multiple organs of the body such as liver, spleen, brain, gastro intestinal tract, gall bladder, pancreas, blood vessels and placenta. Hence the clinical picture could be of wide spectrum ranging from simple malaise to life threatening central nervous symptoms like coma. Hematological abnormalities have been observed in patients with malaria, with anemia, and thrombocytopenia being the most common.[3,4] The clinical pattern of malaria has changed worldwide including India in last decade. Earlier cerebral malaria was the predominant manifestation of severe malaria; whereas now the combination of jaundice and renal failure are more common[5].This retrospective study was carried out see the clinical and biochemical profile of malaria in a tertiary centre located at north Karnataka.

METHODS

This retrospective study was carried out in the department of medicine SDM College of Medical Sciences and Hospital Dharwad, Karnataka. The study period was from 1st January to 31st December 2017. The data was collected retrospectively.

Inclusion criteria

All fever cases above 15 years of age of both the sexes diagnosed as malaria by peripheral smear examination and malaria card test.

Exclusion criteria

Combined malaria with other fevers such as dengue, chikangunya. Fever cases negative for malaria tests. Malaria cases with history of chronic kidney disease, chronic liver disease such as cirrhosis of liver, chronic viral hepatitis, liver abscess, and chronic illness such as rheumatoid arthritis, diabetes, and hypertension.

The data regarding the clinical presentation of patients and laboratory values such as hemoglobin, total leukocyte count, platelet count, total bilirubin, SGOT, SGPT, albumin values collected and analyzed. The results analyzed with tables and percentage.

RESULTS

A total of 57 malaria cases were analyzed. The age and sex distribution of the cases is as shown in Table 1.

Total of 41 (71.9 %) cases were males and 16 (28.1%) cases were females. The commonest age group of cases was between 15-30 years; 35 patients (61.4%), followed by 31-45 year: 10 patients (17.5%), 46-60 years: 8 patients (14%), >60 years: 4 patients (7%).

Table 1: Age and Sex distribution of cases.

Age (years)	Male	Female	Total (percentage)
15-30	23	12	35 (61.4)
31-45	9	1	10 (17.5)
46-60	6	2	8 (14)
>60	3	1	4 (7)
Total	41 (71.9)	16 (28.1)	57 (100)

Out of 57 cases 29 patients (50.9%) had *P. vivax* infection, 20 patients (35.1%) *P. falciparum* infection and 8 patients (14%) mixed infection as shown in Table 2.

Table 2: Distribution of malaria due to different species based on sex.

Plasmodium species	Male	Female	Total	Percentage
Vivax	21	8	29	50.9
Falciparum	15	5	20	35.1
Mixed	5	3	8	14.0
Total	41	16	57	100

Clinical features observed in total number of patients with percentage (Table 3).

Table 3: Clinical features at presentation.

Clinical features	No. of patients	Percentage
Fever with chills	57	100
Headache	26	45.6
Vomiting	39	68.4
Pain abdomen	25	43.9
Breathlessness	5	8.8
Hepatomegaly	20	35.1
Splenomegaly	32	56.1
Combined organomegaly	18	31.6
Altered sensorium	4	7.0
Convulsion	4	7.0
Shock	3	5.3

The most common clinical presentation was fever with chills (100%) followed by vomiting (68.4%), splenomegaly (56.1%), headache (45.6%), pain abdomen (43.9%). 4 patients presented with convulsion and altered sensorium and 3 patients with shock.

Out of 57 malarial cases 19 cases (33.3%) had hemoglobin less than 10gm/dl rest >10gm/dl; 14 cases (24.6%) had TLC <4000/mm^3, rest had TLC >4000mm^3; 42 cases (73.6%) had thrombocytopenia, rest had normal thrombocyte count; 4 cases (7%) had hypoglycemia; 46 cases (80.7%) had urea ≥30mg/dl, rest had urea<30 mg/dl; 14 cases (24.6%) had creatinine ≥1.4, rest had creatinine <1.4 mg/dl; 26 cases(45.6%) had total

bilirubin >1.2mg/dl, rest had billirubin less than 1.2 mg/dl; 17 cases (29.8%) had SGOT >45 IU, rest had <45 IU; 33 cases (57.9%) had SGPT >45 IU, rest had SGPT<45 IU and 32 cases (56.1%) had albumin level ≤3.5gm/dl. Laboratory parameters in malaria cases (Table 4).

Table 4: Laboratory parameters in malaria cases.

Lab parameter	Values	No. of cases	Percentage
Hemoglobin	≤10 mg/dl	19	33.3
	>10 mg/dl	38	66.7
Total leucocyte count	<4000/mm^3	14	24.6
	≥4000/ mm^3	43	75.4
Platelets	≤1.5 lakhs/ mm^3	42	73.6
	>1.5 lakhs / mm^3	15	26.4
Hypoglycemia	Yes	4	7
	No	53	92.9
Urea	<30 mg/dl	11	19.3
	≥30mg/dl	46	80.7
Creatinine	<1.4 mg/dl	43	75.4
	≥1.4mg/dl	14	24.6
Total billirubin	≤1.2 mg/dl	31	54.4
	>1.2mg/dl	26	45.6
SGOT	≤45IU	40	70.2
	>45 IU	17	29.8
SGPT	≤45 IU	24	42.1
	>45 IU	33	57.9
Albumin	≤3.5 gm/dl	32	56.1
	>3.5 gm/dl	25	43.9

DISCUSSION

This retrospective study on clinical and biochemical profile of malaria was carried out on the patients admitted to SDM Medical college hospital and research centre Dharwad during 2017. In the present study data was collected from 57 cases diagnosed as malaria, the common age group affected was 15- 30 years (61.4%), a study done by Estacio RH et al reported that most of their patients (30%) were in between 19-35 years of age, Kumar VG et al reported 33% cases were in the age group of 21-30 years of age.[6,7] In the present study 71.9 % cases were males and 28.1% cases were females ,this was similar to a study done by Dash SC et al had males 77.77% and females 22.23%.[8] In the present study 29 patients (50.9%) had *P. vivax* infection, 20 patients (35.1%) *P. falciparum* infection and 8 patients (14%) mixed infection which was similar to the study done by Muddaiah M et al reported that *P. Vivax, P. Falciparum* and mixed malaria infection were 52.54 %, 33.75 % and 13.69% respectively.[9] In the present study 42 patients (73.6%) had thrombocytopenia comparable to study by Patel U et al 78.4%[10].In the present study 26 patients (45.6%) had total bilirubin >1.2 mg/dl, 17 and 33 patients had elevated SGOT and SGPT levels respectively. Hyperbilirubinemia in malaria appears to have hemolytic, hepatic and cholestatic components.[11] Rise in transaminase levels in patients with falciparum malaria have also been reported bymany previous investigators.[12,13] Serum albumin level in our study was ≤3.5 gm/dl in 32 cases (56.1%). The study has shown decreased albumin levels in malaria this is because plasma albumin is a negative acute phase protein.[14]

CONCLUSION

The incidence of complicated malaria has reduced due early diagnosis and prompt treatment of malaria. In the present study young adult hood (15-30 yrs.) commonly affected with malaria and, in males more common than females. Malaria due to plasmodium vivax is more common than falciparum than mixed infection. Thrombocytopenia, altered liver and renal parameters commonly seen in malaria. Patient presenting with acute febrile illness with thrombocytopenia still malaria to be considered one of the differentials.

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