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THE STUDY OF CLINICAL AND LABORATORY PROFILE OF FALCIPARUM MALARIA AND CORRELATION OF HEPATIC DYSFUNCTION WITH MORTALITY OF PATIENTS: A PROSPECTIVE STUDY

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ABSTRACT

Background and objectives: Malaria is a major public health problem in the developing world. The remarkable mortality and morbidity in falciparum malaria is due to its dreaded manifestation, multiorgan involvement and dysfunction, late diagnosis and delayed in initiation of proper and adequate treatment. Hepatic involvement in malaria is common and severe hepatic dysfunction is an harbinger of poor outcome .As such we planned a study of clinical and laboratory profile of Falciparum Malaria and relationship of hepatic dysfunction to treatment outcome. Methodology**:** This was a hospital based prospective observational study, conducted in a tertiary healthcare center in Western Rajasthan. Forty consecutive confirmed patients with *P. falciparum* malaria of age >18 years were included in the study and their clinical and laboratory data were collected and analyzed. **Results:** Total 40 patients were included in the study, out of which 22 (55%) were males and 18 (45%) were females. Fever was the most common symptom observed (100%), followed by headache (50%). The most common sign observed was pallor (85%), followed by splenomegaly (60%). Hepatic dysfunction was present in 45% patients and renal dysfunction in 20% patients while 12.5% had both hepatic and renal dysfunction. Cerebral malaria was diagnosed in 25% patients. Elevated serum bilirubin, AST and ALT shows significant relationship with mortality ($p < 0.05$). **Conclusion:** We found that hepatic and renal dysfunction is very common in Falciparum malaria and early recognition of hepatic dysfunction can aid in scrutinizing patients with poor outcome. This may aid in early recognisation of patients with poor prognosis who may need critical monitoring and care with proper use of resources, which is vital in resource constrained areas.

INTRODUCTION

Malaria remains a major public health problem in the developing world. Malaria is endemic in India with an estimated 70-100 million cases each year of which 45-50 % are plasmodium falciparum.[1] Plasmodium falciparum is associated with higher mortality as compared to other strains of malaria. The remarkable morbidity and mortality in falciparum malaria is due to its dreaded manifestation, multiorgan involvement and dysfunction, late diagnosis and delayed in initiation of proper and adequate treatment.[2] The emergence of drug resistance in the parasite and insecticide resistance in vector adds to the seriousness of the problem.[3]

Human malaria has a broad clinical spectrum that includes asymptomatic infection, uncomplicated malaria, and complicated and lethal malaria cases.[4] This clinical spectrum depends on the complex interaction between the parasite, human host and environmental factors.[5]

P. falciparum infection can lead to cerebral malaria, acute renal failure, acute malarial hepatitis, hypoglycemia, hyperpyrexia, noncardiogenic pulmonary edema, adult respiratory distress syndrome, adrenal insufficiency-like syndrome, hyperparasitemia, blackwater fever, cardiac arrhythmias, and gastrointestinal syndromes.[6,7,8]

MATERIAL AND METHOD

This was a hospital based prospective observational study, conducted in the Department of Medicine in a tertiary healthcare center in Western Rajasthan. The study included 40 consecutive patients with *P. falciparum* malaria who were admitted in hospital over a period of one year. Adult patients of >18 years age, either male or female, presenting with fever and confirmed as *P. falciparum* based on the detection of asexual forms of *P. falciparum* in a blood smear were included in the study. Those with a negative peripheral smear for *P. falciparum*, mixed plasmodium infection, or evidence of any coexisting morbid disorder that could

affect the outcome, for example, congestive heart faliure, diabetes mellitus, chronic renal disease, chronic liver disease, rheumatic heart disease, and coronary artery disease were excluded from the study.

Ethical clearance was taken from the hospital committee and informed consent was obtained from all patients or their relatives as the situation demanded. A detailed history was obtained, and clinical examination was done in all the patients. Various laboratory parameters were investigated in all the patients, including a complete blood count, peripheral blood smear (thin and thick), blood sugar, serum bilirubin, aspartate aminotransferase, alanine aminotransferase, urea, creatinine, serum proteins, serum electrolytes, chest X-ray, and arterial blood gas, if needed. All slides obtained for all the patients were examined by the same pathologist to prevent observation error.

Microscope examination of blood films is the gold standard for the diagnosis of malaria. Blood obtained by pricking a finger or earlobe is ideal because the density of developed trophozoites or schizonts is greater in blood from these capillary-rich areas. Both thick and thin smears were prepared separately for each patient. The blood films were air dried, and thin blood films were fixed with methanol. Blood films were stained with Field's/Giemsa stain. The initial thick smear was declared negative only if no malarial parasites were seen after the examination of a 100 × 1.25 oil immersion high-power field. After the detection of malarial parasites, thin smears were used to identify the parasite species.

Clinical and laboratory profile of these patients were tabulated, and outcome in form of recovery or death were also correlated with liver dysfunction.

RESULTS

Total 40 patients were included in study, out of which 22 (55%) were males and 18 (45%) were females.

Fever was most common symptoms observed in all 40 (100%) cases, followed by headache in 20 (50%) cases. Other symptoms observed were altered sensorium (25%), oliguria (20%), vomiting (17.5%), and convulsion (17.5%). (Table -1), (Fig 1)

On physical examination most common sign observed was pallor in 34(85%) cases, followed by Splenomegaly in 24 (60%) cases. Other signs were Hepatomegaly in 12 (30%), icterus in 9 (22.5%), coma in 7 (17.5%), and upper motor neuron signs in 2 (5%) cases. (Table- 2), (Fig 2)

Spectrum of P. falciparum disease is shown in table 3. Fourteen (35%) patients out of 40 were uncomplicated, 18 (45%) patients presented with hepatic dysfunction (serum bilirubin > 2mg/dl, AST and ALT > 40 IU/L. Renal dysfunction (Blood Urea > 45 mg/dl, and serum creatinine > 1.8 mg/dl) was observed in 8 (20%) cases. Five (12.5%) cases had both hepatic and renal dysfunction. Ten (25%) cases had cerebral malaria of which 5 patients had hepatic, two had renal and one had both renal and hepatic dysfunction.

Relationship between hepatic dysfunction and outcome in form of recovery and death was also observed. Five (33.33%) out of 17 cases who had serum bilirubin > 2mg/dl expired, which showed significant ($p < 0.05$) mortality as compare to 1(4.34%) death out of 23 cases with serum bilirubin < 2mg/dl. (Table-4)

Table 5 showed relationship of AST and ALT level with mortality. Elevated ALT & AST level (> 100 IU) have significant ($p < 0.05$) relationship with mortality.

Table-1: Symptoms Observed In Patients Of Falciparum Malaria.

S.NO.	Symptoms	No. of Cases	Percentage
1	Fever	40	100
2	Headache	20	50
3	Altered sensorium	10	25
4	Oliguria	8	20
5	Vomiting	7	17.5
6	Convulsion	7	17.5

Table-2: Physical Signs Observed In Patients Of Falciparum Malaria.

S.NO.	Symptoms	No. of Cases	Percentage
1	Pallor	34	85
2	Splenomegaly	24	60
3	Hepatomegaly	12	30
4	Icterus	9	22.5
5	Coma	7	17.5
6	Upper Motor Neuron(UMN) Signs	2	5

Table-3: Spectrum Of Falciparum Disease.

S.NO.	Falciparum Malaria	No. of Cases	Percentage
1	Uncomplicated	14	35
2	With Hepatic dysfunction (serum bilirubin > 2mg/dl) (ASL & ALT > 40 IU/L)	18	45
3	With Renal dysfunction (Blood Urea > 45 mg/dl) (serum creatinine > 1.8 mg/dl)	8	20
4	With both Hepatic dysfunction and Renal dysfuction	5	12.5
5	Cerebral Malaria	10	25

Table-4: Realationship Of Hepatic Dysfuction To Mortality (Serum Bilirubin).

Serum Bilirubin	< 2 mg/dl		> 2 mg/dl		p value
	No. of patients	Death	No. of patients	Death	
	23	1	17	5	<0.05
Percentage	4.34%		33.33%		

Table-5: Realationship Of Hepatic Dysfuction To Mortality (Ast & Alt).

AST & ALT levels	< 100 IU/L		> 100 IU/L		p value
	No. of patients	Death	No. of patients	Death	
AST	35	3	5	2	<0.05
ALT	36	4	4	2	<0.05

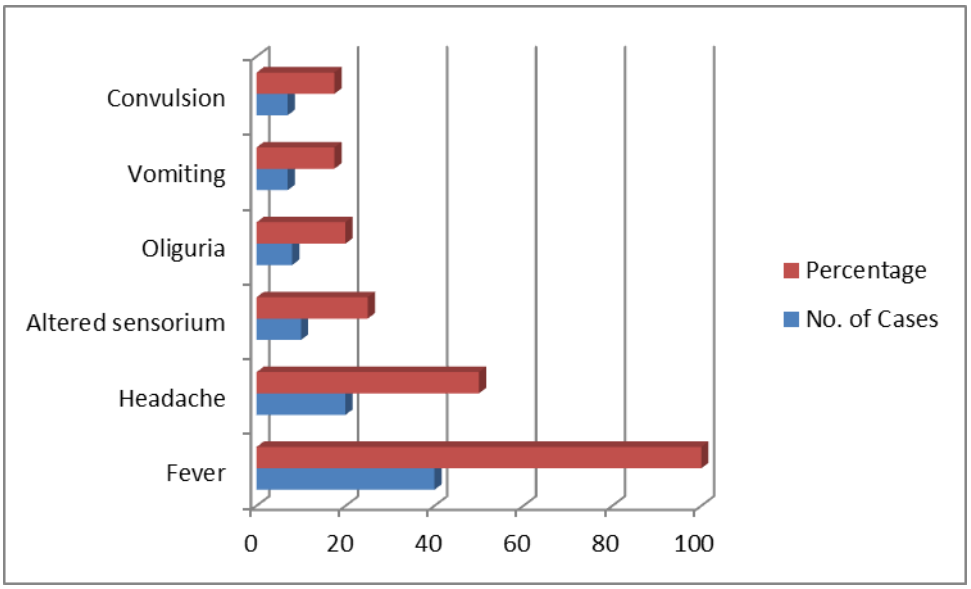

Figure 1- Symptoms Observed In Patients Of Falciparum Malaria.

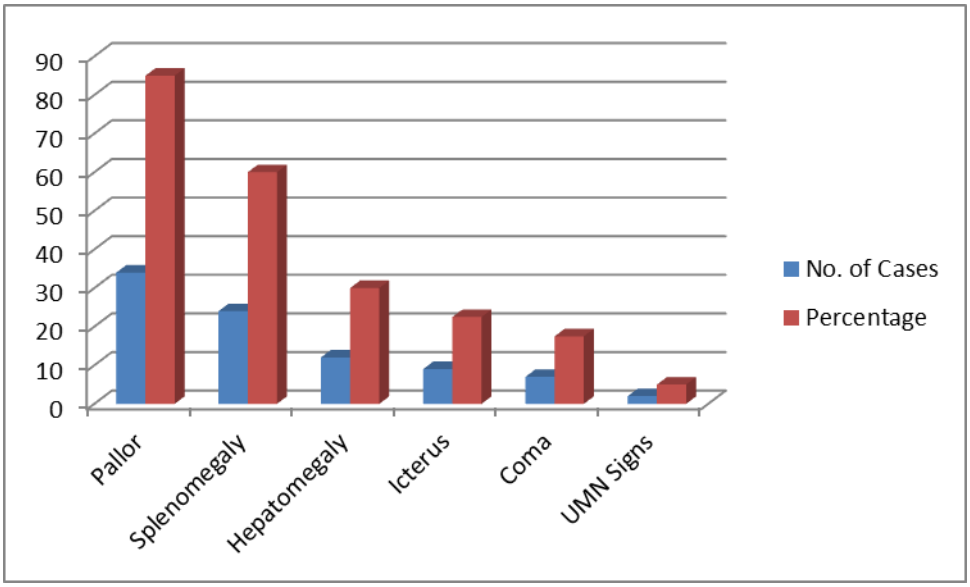

Figure 2- Physical Signs Observed In Patients Of Falciparum Malaria.

DISCUSSION

Falciparum malaria is a leading cause of morbidity and mortality in western Rajasthan. Various complications like cerebral malaria, renal dysfunction, algid malaria, severe anemia and liver involvement are commonly noticed.

In our study 40 patients were included, out of which 55% were males and 45% were females, and majority of patients were between 15-45 years of age (75%).

Of the varied symptoms fever was the commonest, seen in 100% patients, followed by headache in (50%) patients, altered sensorium (25%), oliguria (20%), vomiting (17.5%), and convulsion (17.5%). Shaikh et al[9] reported fever in 100% patients, vomiting and headache in 62% of patients, which was similar to . Fever was observed in 100% of cases by Ali et al[10] Murthy et al[11] reported fever with chills and rigor (98.10%), altered sensorium (48.10%), and jaundice (27.12%).

Pallor was the most consistent sign seen in 85% of patients in our study, the other being splenomegaly 60%, hepatomegaly 30%, jaundice 22.5%, while coma was noted in 17.5% of cases. Upper motor neurons signs were present in 20% of cerebral malaria patients. Similar results were observed in Shaikh et al[9] and Murthy et al[11] study.

Anemia is important cause of mortality and morbidity. Etiology of anemia in Falciparum malaria is mutlifactorial including parasite mediated RBC destruction, bone marrow suppression and bleeding due to severe thrombocytopenia. In our study 70% of the patients had hemoglobin between 5-10 gm%. In one study from Orissa 86.7% patients had anemia.[12] Anemia was observed in 58% of cases by Shaikh et al[9]. Murthy et al[11] and Ali et al[10] reported almost similar results, but Muddaiah and Prakash[13] reported anemia in 14.27% of cases.

The renal dysfunction in our study was observed in 20%, while in study of Koni et al[14] and Wasnik et al[15] renal dysfunction was observed in 45% and 32.5% patients respectively.

Hepatic dysfunction was present in 45% patients in our study. Increased ALT, AST and serum bilirubin were significantly higher in patients who died, and similar results were also observed in Gupta BL et al[16] study.

CONCLUSION

We found that hepatic and renal dysfunction is very common in Falciparum malaria and early recognition of hepatic dysfunction can aid in scrutinizing patients with poor outcome. Hepatic dysfunction is a important predictor of mortality and outcome, and special attention should be paid to these patients.

REFERENCES

1. Malaria Journal 2009; 8: 281.
2. Tamez PA, Liu H, Fernandez-Pol S, Haldar K, Wickrema A. Stage specific susceptibility of human erythroblasts to Plasmodium falciparum malaria infection. Blood 2009: 114(17): 3652-3655.
3. Murthy GL, Sahay RK, Srinivasan VR, Upadhaya AC, Shantaram V, Gayatri K. Clinical profile of falciparum Malaria in a tertiary care hospital. *J Indian Med Assoc* 2000; 98: 160-2,169.
4. Grobusch MP, Kremsner PG. Uncomplicated Malaria. In: Sullivan DJ, Krishna S, editors. Malaria: Drugs, Disease and Post-genomic Biology. Current Topics in Microbiology and Immunology. Berlin: Springer Berlin Heidelberg; 2005; 81–104.
5. Maitland K, Marsh K. Pathophysiology of severe malaria in children. Acta Trop. 2004; 90: 131–40. doi: 10.1016/j.actatropica.2003.11.010.

6. Kochar DK, Kochar SK, Agrawal RP, Sabir M, Nayak KC, Agrawal TD, et al. The changing spectrum of severe falciparum malaria: A clinical study from Bikaner (Northwest India) J Vector Borne Dis. 2006; 43: 104–8.
7. Bhalli MA. *P. falciparum* malaria – A review of 120 cases. J Coll Physicians Surg Pak. 2001; 11: 300–3.
8. Mohapatra MK. The natural history of complicated falciparum malaria – a prospective study. J Assoc Physicians India. 2006; 54: 848–53.
9. Shaikh MK, Lohana RK, Abbasi P, Gill FA, Devrajani BR, Shah SZ, et al. Clinical features and complications of *Plasmodium falciparum* malaria at Liaquet University Hospital Hyderabad. World Appl Sci J. 2001; 13: 651–4.
10. Ali H, Ahsan T, Mahmood T, Bakht SF, Farooq MU, Ahmed N. Parasite density and the spectrum of clinical illness in falciparum malaria. J Coll Physicians Surg Pak. 2008; 18: 362–8.
11. Murthy GL, Sahay RK, Srinivasan VR, Upadhaya AC, Shantaram V, Gayatri K. Clinical profile of falciparum malaria in a tertiary care hospital. J Indian Med Assoc. 2000; 98: 160–2, 169.
12. Sharma SK, Das RK, Das PK. Hematological and coagulation profile in acute falciparum malaria. *JAPI* 1992; 40: 581-83.
13. Muddaiah M, Prakash PS. A study of clinical profile of malaria in a tertiary referral centre in South Canara. J Vector Borne Dis. 2006; 43: 29–33.
14. Mahesh KB. A one year cross sectional study of clinical profile of falciparum malaria in K.L.E.S Hospital & Mrc, Belgaum.[dissertation]. Karnataka: Jawaharlal Nehru Medical College, K.L.E University; 2005.
15. Wasnik PN, Manohar TP, Humaney NR, Salkar HR. Study of clinical profile of falciparum malaria in a tertiary referra tertiary referral centre in Central India. J Assoc Physicians India 2012; 60: 33-36.
16. Clinical Profile and Prognostic Indicators in Adults Hospitalized with Severe Malaria Caused by Different *Plasmodium* Species. Bal Kishan Gupta, Anjli Gupta, Hardev Ram Nehra, Heera Ram Balotia, Shyam Lal Meena, Surendra Kumar. Infect Dis 2015; 8: 45–50.