

# Clinico-hematological Profile of Patients with Falciparum Malaria.

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## ABSTRACT

**Background:** Malaria is one of the major public health problems of the country. Worldwide prevalence of malaria is about 300- 500 million per annum. It is present in more than 100 countries around the world. Most of these are developing countries or under developed countries. So it has a great impact on their economy. The aim is to study the clinicohematological profile of patients with falciparum malaria. **Methods:** The present study was conducted at MNR Medical College and Hospital, Sanga Reddy, Andhra Pradesh. The study was carried out in 100 patients out of 121 cases of Falciparum malaria, admitted during the period of 2010 November to 2012 October in this hospital. **Results:** The numbers of males (72%) affected in our study were more compared to females (28%). The male to female ratio was 2.5:1. In this study the predominantly affected age group was between 20-40 years. The most common presenting symptom was fever i.e. in 100% of cases. Pallor was noted in 81 % of the total cases. It was found that 37% of patients had normocytic normochromic picture on peripheral smear. **Conclusion:** Incidence of falciparum malaria was more compared to other plasmodium. Fever was the chief presenting complaint in almost all the cases. Thrombocytopenia is very common in malaria, but spontaneous bleeding is rare.

**Key words:** Clinico-hematological profile, Falciparum malaria, Patients.

## INTRODUCTION

The story of malaria is fascinating. Malaria plagued the mankind in the past. Now it is mostly ignored as a simple disease. But one should not forget that it still has vampirical outcomes in few cases. Still it is one of the most common endemic diseases, especially African tropical countries and India.<sup>[1]</sup>

Malaria is one of the major public health problems of the country. Worldwide prevalence of malaria is about 300-500 million per annum.<sup>[2]</sup> It is present in more than 100 countries around the world. Most of these are developing countries or under developed countries. So it has a great impact on their economy. The total economic loss is estimated to be approximately 0.5-1 billion per annum. This figure is an underestimate. Around 1.5 million confirmed cases are reported annually by the National Vector Borne Disease Control Programme (NVBDCP); of which 40-50% is due to Plasmodium Falciparum. 216 million cases of malaria in 2010 resulting in 655,000 deaths.<sup>[3]</sup> This is equivalent to roughly 2000 deaths every day.<sup>[4]</sup> A 2012 study estimated the number of documented and undocumented deaths in 2010 was 1.24 million. Malaria is curable if effective treatment is started early. Delay in treatment may lead to serious consequences including death. Prompt and effective treatment is also important for controlling the transmission of malaria.

Malaria has variety of presentations, fever and chills are the most common symptoms and other symptoms include chills and rigor and easy fatigability. One of the dreadful complications of falciparum malaria is cerebral malaria, if not detected early and treated effectively.

Study on profile of falciparum malaria will provide insights into common presentations of falciparum malaria. Hence this study was planned to study the clinicohematological profile of patients with falciparum malaria.

## MATERIALS & METHODS

The present study was conducted at MNR Medical College and Hospital, Sanga Reddy, Andhra Pradesh. The study was carried out in 100 patients out of 121 cases of Falciparum malaria, admitted during the period of 2010 November to 2012 October in this hospital (other 21 cases were not studied as they had other associated conditions like chronic kidney disease, chronic liver failure, chronic neurological illness); to study the clinical, hematological and coagulation profile in falciparum malaria.

### Inclusion Criteria:

Fresh cases of falciparum malaria admitted to the medical wards, diagnosed by peripheral smear and dip stick method.

### Exclusion Criteria:

- Chronic liver diseases.
- Fever due to any other cause including other plasmodium species.
- Chronic kidney diseases.
- Mixed plasmodium infections.
- Chronic neurological disorders.

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A detailed history was taken followed by a detailed clinical examination to assess clinical severity.

**Investigations:** The following investigations for hematological and coagulation parameters were carried out:

- Hemoglobin estimation by auto analyzer.
- RBC count and Total and Differential counts by auto analyzer.
- Total platelet count by auto analyzer. Whole bleeding time by Dukes method
- Prothrombin time, Activated Partial Thromboplastin Time by analyzer.

## RESULTS

The present study was conducted at MNR Medical College and Hospital, Sanga Reddy, Andhra Pradesh. The study was carried out in 100 patients out of 121 cases of Falciparum malaria, admitted during the period of 2010 November to 2012 October, in this hospital (other 21 cases were not studied as they had other associated diseases like chronic kidney disease, chronic liver failure, chronic neurological illness); to study the clinical features, hematological; and coagulation profile in falciparum malaria

**Table 1:** Showing the distribution of total admissions in the medical wards during the study period

Type of cases	No. of admissions
Number of admissions due to medical causes	19413
Malaria cases	276
Falciparum malaria cases out of 276	121
Falciparum malaria patients included in the present study out of 121	100

Total cases admitted in the medical ward from 2010 November to 2012 October were 19413 cases. Out of this; malaria cases were 276. The incidence of malaria was around 1.5 %. Out of the 276 cases; cases of plasmodium falciparum were 121 cases and the rest were of other species and mixed species. So the incidence of falciparum is 43.8 %. The numbers of males (72%) affected in our study were more compared to females (28%). The male to female ratio was 2.5:1 [Table 1].

In this study the predominantly affected age group was between 20-40 years. 74 patients belonged to

this age group. More than 70% of the patients were young individual who were working. The numbers of people above the age of 60 years were very less i.e. 2%. There was no patient above the age of 70 years recorded in this study [Table 2].

The most common presenting symptom was fever i.e. in 100% of cases. This was followed by chills and rigors in 78% of cases. Only 3% of patients presented with the altered sensorium. 17% of patients manifested with abdominal pain and 4% as seizures among all the falciparum malaria cases [Table 3].

**Table 2:** Age distribution of study subjects (N = 100)

Age group (years)	Number	Percentage
< 30	41	41
31-40	33	33
41-50	14	14
51-60	10	10
61-70	2	2
Total	100	100

**Table 3:** Distribution of study subjects according to their symptoms

Symptoms	Percentage
Fever	100
Chills and rigors	78
Easy fatiguability	56
Nausea and vomiting	38
Cough	20
Altered sensorium	3
Bleeding	4
Abdominal pain	17
Seizures	4

**Table 4:** Distribution of study subjects according to their signs

Signs	Percentage
Pallor	81
Splenomegaly	58
Hepatomegaly	22
Icterus	18
Pedal edema	7
Central nervous system related	7
Petechiae	2

Pallor was noted in 81 % of the total cases. Anaemia was the most frequent physical sign in our study. Icterus was noted in 18% of the total patients. Out of 100 patients in the study 58 patients had splenomegaly. Hepatomegaly was noted in 22 patients. Pedal edema was noticed in 7% of the patients. CNS Involvement in the form

of altered sensorium and seizures was seen in 7% of the patients [Table 4].

It was found that 37% of patients had normocytic normochromic picture on peripheral smear and same number had microcytic hypochromic picture. 26% had dimorphic picture [Table 5].

**Table 5:** Peripheral smear study in falciparum malaria cases

Type of smear	Percentage
Normocytic normochromic	37
Microcytic hypochromic	37
Dimorphic picture	26

**Table 6:** Incidence of thrombocytopenia among patients

Platelet count	Percentage
< 50,000	4
50,000–1,50,000	64
> 1,50,000	32

It was observed in 68% of the patients. Out of these 68 patients only 4 patients had severe thrombocytopenia less than 50,000/mm<sup>3</sup>. Bleeding time was prolonged in 6 cases out of 100 cases, out of which 4 had bleeding manifestations. 5 of the (83.8%) had longer duration of hospital stay. Out of 100 cases only 24 had prolonged PT. Out of them, 24 cases with elevated PT. Only 3 had bleeding manifestations. 50% with elevated PT had prolonged hospital stay. 4 cases out of 6 with elevated APTT had bleeding manifestations. 50% had prolonged hospital stay [Table 6].

## DISCUSSION

In our study 1.5% of admissions in the medical ward were due to malaria cases, out of which 43.8% cases belonged to plasmodium falciparum. According to WHO criteria<sup>[2]</sup>, 49.2 % to 50.8 % of the malaria cases are due to plasmodium falciparum species. Our study correlates with WHO observations.

In the present study the male to female ratio was 2.5:1 as compared to Bhakshi et al<sup>[5]</sup> and other studies mentioned in the above table. The reason for more incidence of malaria in men than in women may be due to the working pattern; i.e. men are exposed to mosquito bites outdoors whereas females are less exposed.

In Srinivas SV et al<sup>[6]</sup>, the maximum number of patients were in the age group of 26-40 years, i.e. 42%. In Preetam et al study<sup>[7]</sup>, most of the patients were between the age group 21-40 years with the highest incidence between the age group of 21-30. In the present study; highest incidence was seen among the age group 30 to 49 years. The working group is the age group which is predominantly affected, because this is the group which is exposed to the mosquito bites especially in the fields and outdoors.

Also our study follows the age pyramid in our country where the base is formed by young people and apex by the older age that constitutes lesser percentage of the population. In a study by Malhotra et al<sup>[8]</sup> the percentage of people above sixty years was just 4%. Our study shows the percentage of people affected over 60 years was 12%.

Fever was the most predominant complaint in our study i.e. 100% patients presented with fever and 78% of the patients had chills and rigors. In the study conducted by Mehta et al<sup>[9]</sup>, Preetam et al<sup>[7]</sup>, Srinivas SV et al<sup>[6]</sup>; fever was present in 100%. Our study correlates with these studies.

56% of the patients in our study had easy fatigability as the presenting complaint. There was no mention regarding this in any other studies. It was predominantly seen in cases with anemia.

Vomiting was observed in 43.3% of the patients in the study conducted by Mehta et al<sup>[9]</sup> and it was seen in 38% of the patients with our study. It was seen in 23% of the patients in the study conducted by Naval hospital<sup>[10]</sup>. Our findings correlate with other studies.

Cough and breathlessness was a presenting complaint in 4.47% of the patients in the study conducted by Mehta et al<sup>[9]</sup> and the symptoms were noted in 20% of the patients in our study. Out of these 20 patients, 3 had pulmonary edema and 17 were cases of COPD.

The number of patients presenting with altered sensorium were 50% of the cases in a study conducted by Malhotra et al<sup>[8]</sup> compared to the present study of 7%.

Abdomen pain seen in 17 % of the cases, there was no mention about this in any other study. Some of these patients who had abdominal pain were on other drugs like anti hypertensive or analgesics. Hence the possibility of drug induced gastritis as a major cause for abdominal pain cannot be ruled out.

Pallor was present in 75 % of the patients in a study carried out by Malhotra et al<sup>[8]</sup> it was noted in 81 % in our study. The incidence of pallor was more in patients with falciparum in their study. In study conducted by Srinivas SV et al<sup>[6]</sup> pallor (62%) was the most common sign followed by splenomegaly (62%) and icterus (48%).

Icterus was noted in 18% of the patients in our study whereas it was seen in 25% of patients by Malhotra et al<sup>[9]</sup>, 48% in Srinivas SV et al<sup>[6]</sup>. Splenomegaly was seen in 58 % of the patients in our study similar rates were observed in a study by Murthy et al<sup>[12]</sup> where the percentage of patients with splenomegaly was 50% and in Srinivas SV et al<sup>[6]</sup> study it was 62%. High incidence of splenomegaly was noted in a study conducted by Ram et al<sup>[12]</sup> the incidence was 88.75% in their study. Comparatively high incidence of 60% was also observed by Nand et al.<sup>[14]</sup>

Hepatomegaly was noted in 22 % of the patients in the present study. Studies by Ram et al<sup>[13]</sup> and Murthy et al<sup>[11]</sup> have shown a higher incidence of hepatomegaly in their work. It might be due to the fact that their study mainly concentrated on the subjects such as malarial hepatitis and jaundice in malaria.

Coma, Seizures or altered sensorium was observed among 7% of the patients in our study. It was noted that only patients with falciparum infection had these symptoms. Study by Malhotra et al<sup>[8]</sup> also had similar observation where the CNS involvement was noted in 12.5% of the patients this signifies that cerebral malaria can be caused only by pl. falciparum

None of the patients with cerebral malaria had any residual neurological sequelae in our study. Newton CR et al<sup>[14]</sup> in their study noted that approximately 3% of the patients with cerebral malaria had neurological deficit.

Pedal edema was seen in 7 % of cases in our study, there was no study related to pedal edema in malaria. In our case it could be due to anemia, hypoalbuminemia.

Petechiae were seen in 2 cases, it was one of the bleeding manifestations noted. There was no study about the petechial as bleeding manifestation in complicated malaria. These patients had thrombocytopenia.

Anaemia was present in 81 % of patients in our study the incidence of severe anaemia (Hb < 7 gm%) was seen in 12 % of the patients and it was comparable to study done by Mehta et al which had severe anaemia incidence of 18%. The overall incidence of anaemia was higher in studies conducted by Sharma et al<sup>[15]</sup> where the incidence was 86.7% and Preetam et al<sup>[8]</sup> study. The higher incidence could be explained by the fact that their study also involved cases of falciparum malaria. Our study correlates with these studies. Cases with

severe anemia had other complications and prolonged hospital stay compared to other cases.

In our study 37 % of the patients had normocytic normochromic blood picture. It was comparable to a study by Sen et al<sup>[16]</sup> where of half the patients had normocytic normochromic blood picture.

In our study 37% of the patients had microcytic hypochromic blood picture. This could be due to the prevalence of associated iron deficiency anaemia along with malaria in our country. In their study also microcytic hypochromic picture was seen in 20% of cases.

## CONCLUSION

Incidence of falciparum malaria was more compared to other plasmodium. Fever was the chief presenting complaint in almost all the cases. Thrombocytopenia is very common in malaria, but spontaneous bleeding is rare.

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