Original Article

A clinical study of falciparum malaria with special reference to its complications among malaria patients

M. Divya Reddy¹, K. N. Sudha Ramana²

¹Consultant Physician, Titan Hospital (Unit of bristlecon Group of hospitals), Hayathnagar, Hyderabad

²Professor of Medicine and Dean, Malla Reddy Medical College for Women, Hyderabad

Corresponding Author:
Dr. K. N. Sudha Ramana
Email: sudhramanakn1951@gmail.com

Abstract:

Background: Malaria is the most common cause of hemolytic anemia and other causes of anemia include defective erythropoiesis and reticulocyte production. Other hematological complications include thrombocytopenia and platelet dysfunction. Coagulopathy abnormalities are also in severe malaria.

Objectives: To study complications of falciparum malaria.

Material and methods: A total of 100 cases of laboratory confirmed and admitted cases of falciparum malaria during the study period of two years, who fulfilled inclusion and exclusion criteria were studied. Complete relevant history, thorough clinical examination was carried out to assess complications.

Results: The most common complication of falciparum malaria was renal and hepatic involvement. Among 31 patients with complications, 17 had single complication, 5 had two complications, 5 had three complications, and 4 patients had 4 complications. Elevated blood urea and creatinine was noted in 18 patients among 100 cases. Out of them 88.8% had longer duration of hospital stay. Elevated bilirubin levels were seen in 18 patients.

Conclusion: Falciparum malaria is associated with other complications which include cerebral malaria, renal involvement, hepatopathy, respiratory manifestations, which may lead to increase in the mortality if not detected early and treated properly and adequately.

Key words: Falciparum malaria, complications, renal involvement

INTRODUCTION:

Malaria is the most common cause of hemolytic anemia and other causes of anemia include defective erythropoiesis and reticulocyte production. Other hematological complications include thrombocytopenia and platelet dysfunction. Coagulopathy abnormalities are also in severe malaria.¹

In the past, chloroquine was effective for treating nearly all cases of malaria. In recent studies, Chloroquine – resistant falciparum malaria has been observed with increasing frequency across the country. The continued treatment of such cases with chloroquine is probably one of the factors responsible for increased proportion of P. falciparum relative to P. vivax. There have been great advances in medical field and we have also been able to understand malaria better. There has been a lot of development in antimalarial drugs. Even with these advances we are not able to completely control or eradicate malaria. Still many deaths occur due to malaria. In the last few decades an effort has been made to produce an effective malaria vaccine. These are still at developmental stages.²

In India steps were taken to control malaria such as: National Malaria Control programme in 1953. This was a huge success. So Government came out with National malaria eradication programme in 1958. Malaria re-emerged in 1960. Later government came with MPO in 1977. Even with all these efforts the mortality due to malaria in India is 22 per 1000 cases.¹

Among all the four species of the malaria parasite, plasmodium falciparum is known to cause complications...
which involve any system of the body especially the central nervous system.

**MATERIAL AND METHODS**

Institutional Ethics Committee permission was obtained. Informed consent was taken from all patients who were included in the study.

Study settings: Department of General Medicine, MNR Medical College and Hospital, Sangareddy

Sample size: A total of 100 cases of laboratory confirmed and admitted cases of falciparum malaria during the study period of two years, who fulfilled inclusion and exclusion criteria were studied.

Patients with chronic liver disease, fever due to any other cause including other plasmodium species, chronic kidney disease, mixed plasmodium infections, and any chronic neurological disorders were excluded from the study.

Complete relevant history, thorough clinical examination was carried out to assess complications.

A detailed relevant history, thorough clinical examination was carried out to assess complications as per the clinical proforma attached.

**Investigations:** Renal function tests, Liver function testsRandom blood sugar, Complete urine examination

Once the patient was diagnosed to have malaria, they were started on Anti-Malarial drugs. Other supportive treatment was given according to the patient’s conditions and presence of complications.

During the hospital stay; patients were observed and followed up till the discharge for clinical profile, complications, haematological abnormalities.

Data was recorded in the Microsoft excel worksheet and analyzed using the percentages.

**RESULTS**

Table 1: Complications in falciparum malaria

<table>
<thead>
<tr>
<th>Type of complication</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cerebral malaria</td>
<td>7</td>
</tr>
<tr>
<td>Pulmonary edema</td>
<td>3</td>
</tr>
<tr>
<td>Bleeding manifestation</td>
<td>4</td>
</tr>
<tr>
<td>Hepatic involvement</td>
<td>18</td>
</tr>
<tr>
<td>Renal involvement</td>
<td>18</td>
</tr>
<tr>
<td>Hypoglycemia (&lt; 70 mg/dl)</td>
<td>5</td>
</tr>
</tbody>
</table>

The most common complication of falciparum malaria was renal and hepatic involvement in 18% each of the patients followed by the dreaded complication i.e. cerebral malaria in 7% of patients. Only 3% had shown the involvement of lungs in the form of pulmonary edema. Hypoglycemia was noted in 5% of patients.

Table 2: distribution of complicated cases

<table>
<thead>
<tr>
<th>Number of patients</th>
<th>Number of complications</th>
</tr>
</thead>
<tbody>
<tr>
<td>17 patients</td>
<td>1</td>
</tr>
<tr>
<td>5 patients</td>
<td>2</td>
</tr>
<tr>
<td>5 patients</td>
<td>3</td>
</tr>
<tr>
<td>4 patients</td>
<td>4</td>
</tr>
</tbody>
</table>

Among 31 patients with complications, 17 had single complication, 5 had two complications, 5 had three complications, and 4 patients had 4 complications.

Average duration of hospital stay was 6-9 days for complicated cases whereas it was only 3-5 days for uncomplicated cases.

Cerebral malaria was seen in 7 cases out of 100. 3 of them presented with altered sensorium and 4 presented with seizures. Among 7 patients with cerebral malaria 3 had extensor plantar. All of them had longer duration of hospital stay.

Out of 4 patients who presented with bleeding manifestations 2 had microscopic hematuria and 2 had petechiae.

Table 3: Incidence of renal involvement in malaria its effect on hospital stay

<table>
<thead>
<tr>
<th>Elevated blood urea and creatinine</th>
<th>Percentage</th>
<th>Number of cases with prolonged hospital stay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present</td>
<td>18</td>
<td>16 (88%)</td>
</tr>
<tr>
<td>Absent</td>
<td>82</td>
<td>17 (20.7%)</td>
</tr>
</tbody>
</table>

Elevated blood urea and creatinine was noted in 18 patients among 100 cases .Out of them 88.8 % had longer duration of hospital stay.

Table 4: Incidence of hepatic involvement in malaria its effect on hospital stay

<table>
<thead>
<tr>
<th>Elevated bilirubin</th>
<th>Percentage</th>
<th>Number of cases with prolonged hospital stay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present</td>
<td>18</td>
<td>15 (83.3%)</td>
</tr>
<tr>
<td>Absent</td>
<td>82</td>
<td>18 (21.9%)</td>
</tr>
</tbody>
</table>

Elevated bilirubin levels were seen in 18 patients. Out of them 83.3 % had prolonged hospital stay.
In the present study; PT was elevated in 24% of the total cases. In a study conducted by S. Roy et al, PT was increased in 11.6% of cases. In a study of severe falciparum malaria cases by R. Clemens et al, PT was prolonged in 22.7% of the cases this was similar to the observations in our study. Out of 24 patients with elevated PT 3 had bleeding manifestations and 12 patients (50%) had longer duration of hospital stay. In our study APTT was found to be increased in 6% of the patients. In a study conducted by S. Roy et al, APTT was increased in 6% of the patients this was similar to what we observed in our study. And 4 patients with increased APTT had bleeding manifestations. 3 (50%) patients had prolonged hospital stay.

Pukrittayakamee et al: Conventional indices of coagulation (prothrombin time, partial thromboplastin time, fibrinogen, fibrin degradation products) were usually within the normal range but reduced plasma concentrations of antithrombin III (AT-III) levels were noted in all groups, and the incidence was significantly higher in patients with severe and moderate malaria. Activation of coagulation is a common and sensitive measure of disease activity in falciparum malaria. It is not a specific feature, nor is there evidence to suggest it has a primary pathological role in severe infections.

**CONCLUSION:**

Severe anemia and other hematological abnormalities are the poor prognostic factors and are also responsible for longer hospital stay as compared to patients with uncomplicated malaria. Falciparum malaria is associated with other complications which include cerebral malaria, renal involvement, hepatopathy, respiratory manifestations, which may lead to increase in the mortality if not detected early and treated properly and adequately.

**REFERENCES:**

3. Preetam et al. Study of Clinical Profile of malaria in Tertiary Referral Centre in Central India; JAPI oct 2001
4. Srinivas SV et al; Clinical profile of falciparum malaria with special reference to complications and outcome; APRIL 2010 RGUHS.
8. Wheelerall: Importance of anaemia in cerebral and uncomplicated malaria; role of complications.
dyserythropoiesis and; Quarterly Journal of Medicine 1986; 58: 305 – 323.


11. Activation of the coagulation cascade in falciparum Malaria S. Pukrittayakamee ; Transactions of the Royal Society of Tropical Medicine and Hygiene 1989;83(6).

Source of Support: Nil. Conflict of Interest: None.