Evaluation of Jaundice as a Prognostic Marker in patients of Malaria at Tertiary Care Centre

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ABSTRACT

BACKGROUND: Malarial infection carries a poor prognosis in complicated cases with a high mortality if untreated, but it has an excellent prognosis if diagnosed early and treated appropriately. The clinical spectrum may extend from benign fever, malaise in uncomplicated cases to the potentially lethal complications such as cerebral malaria, acute renal failure, hepatic dysfunction, metabolic acidosis, shock, non cardiogenic pulmonary edema and others in complicated malaria. By evaluation of the jaundice as prognostic marker in Malaria, prompt management and intensive care can be initiated so as to save the life of the patient. MATERIAL & METHODS: A prospective study was conducted from January 2015 to November 2015 among 400 confirmed smear positive cases for malaria at New Civil Hospital, Surat. Cases were grouped into Mild (3-6 mg/dl), Moderate (6-10 mg/dl) and Severe (>10 mg/dl) according to S. Bilirubin level for course of illness and analysis. RESULTS: Jaundice was seen in 13.25% case and was more common in age group of 15-24 years. Male: female ratio was 6.5:1. Mortality in patient of jaundice with malaria was 5.67%. Out of 53 patients with high serum bilirubin level, maximum (84.9%) had S. Bilirubin 3-6 mg%. Majority of patient has direct hyperbilirubinemia i.e. 58.5% cases and indirect hyperbilirubinemia in 41.5% cases. High Mortality (100%) was recorded in patient of jaundice with cerebral malaria. In patient having jaundice, ARF was present in 15.1% and mortality was 12.5% while 0.3% patients had ARF without jaundice and no mortality found. In patients with jaundice having ARDS 50% mortality was seen while patients with ARDS without jaundice no mortality found. CONCLUSION: Jaundice is poor Prognostic marker if associated with other organ involvement in malaria.

Key Words: Jaundice, Prognostic Marker, Malaria

INTRODUCTION

Malaria is the most important tropical disease and a very common disease in our country leading to significant morbidity and mortality.¹,² Malaria is caused by 5 different species of parasites plasmodium viz. p. falciparum, p. vivax, p. malariae, p. ovale and P. knolesi. Out of these five, p.falciparum causes the most serious infections. Clinical presentation of falciparum malaria may vary in individuals depending upon the level of parasitemia and immune status of the patient. But, in recent years Clinical presentation of P. vivax malaria may vary in individuals and severe life threatening complications may occur.³ Malarial infection carries a poor prognosis in complicated cases with a high mortality if untreated, but it has an excellent prognosis if diagnosed early and treated appropriately. The clinical spectrum may extend from benign fever, malaise in uncomplicated cases to the potentially lethal complications such as cerebral malaria, acute renal failure, hepatic dysfunction, metabolic acidosis, shock, non cardiogenic pulmonary edema and others in complicated malaria. So, the present study is designed To Evaluate THE JAUNDICE AS PROGNOSTIC MARKER IN MALARIA. Thus, prompt management and intensive care can be initiated so as to save the life of the patient.

MATERIAL AND METHODS

The present prospective study included 400 cases of confirmed smear positive cases of malaria admitted in New civil hospital, Surat from January 2015 to November 2015.
### Evaluation of Jaundice as a Prognostic Marker

#### Inclusion Criteria:
All patient with age >15 years, irrespective of gender, having positive smear for malaria have been included in present study.

#### Exclusion Criteria:
- Known case of chronic liver disease
- Chronic alcoholics
- Patients on hepatotoxic drugs
- Patients on Antitubercular Therapy

<table>
<thead>
<tr>
<th>S. Billirubin level in patient with Jaundice</th>
<th>Patients with Jaundice (n=53)</th>
<th>Patients Expired with Jaundice (n=3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-6 mg%</td>
<td>45(84.90%)</td>
<td>1(1.89%)</td>
</tr>
<tr>
<td>6-10 mg%</td>
<td>5(9.43%)</td>
<td>1(1.89%)</td>
</tr>
<tr>
<td>&gt;10 mg%</td>
<td>3(5.67%)</td>
<td>1(1.89%)</td>
</tr>
</tbody>
</table>

The details regarding history of the patient, personal details of the patient, local examination findings, laboratory and other investigations, clinical diagnosis were recorded on predesigned questionnaire. All malaria positive patients are grouped into Mild (3-6mg/dl), Moderate(6-10mg/dl) and Severe (>10mg/dl) according to S. Billirubin level. Course of illness was followed and data analysis was done according to outcome, hospital stay, other complications and mortality was observed. Data entry and analysis was undertaken by EpiInfo software (version 6.04).

#### RESULTS

#### Table 1: Age & Sex distribution of the study population.

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>No. of Patients (% )</th>
<th>Male (%)</th>
<th>Female(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-24</td>
<td>148 (37)</td>
<td>109 (27.25)</td>
<td>39 (9.75)</td>
</tr>
<tr>
<td>25-34</td>
<td>110 (27.3)</td>
<td>81 (20.25)</td>
<td>29 (7.25)</td>
</tr>
<tr>
<td>35-44</td>
<td>62 (15.5)</td>
<td>49 (12.25)</td>
<td>13 (3.25)</td>
</tr>
<tr>
<td>45-54</td>
<td>42 (10.5)</td>
<td>34 (8.5)</td>
<td>8 (2.0)</td>
</tr>
<tr>
<td>&gt;55</td>
<td>38 (9.5)</td>
<td>33 (8.25)</td>
<td>5 (1.25)</td>
</tr>
</tbody>
</table>

#### Table 2: Distribution of the patients with jaundice according to their S.Billirubine level and outcome.

In our study, maximum patient, 37%, were in 15-24 years age group, mean age of the patient was 31.77 years and 76.5% patients were males while 23.5% were females.

#### Table 3: Distribution of the patients with jaundice according to hyperbillirubinemia and its relation with mortality.

P value=0.15

#### Table 4: Distribution of the study population according to associated complications.

Incidence of ARF in patient with jaundice was 13.28%. Mortality in patient of jaundice with ARF was 12.5% and in patient without jaundice is 0%. 3.77% patient with jaundice had cerebral malaria while cerebral malaria was present in 0.86% of patient of without jaundice. Mortality in patients of jaundice with cerebral malaria was 100% as compared to patient without jaundice with cerebral malaria in which mortality was 0%. 7.54% patient with jaundice had ARDS while ARDS was present in 0.57% of patient without jaundice. Mortality in patient of jaundice with ARDS was 50% as compared to patient without jaundice with ARDS in which mortality was 0%. This suggests that presence of ARDS with...
jaundice in malaria significantly increase mortality. 3.78% patients with jaundice had shock (SBP<90mmhg) while shock was present in 1.15% of patient without jaundice. Mortality is present in 100% patient of shock with jaundice. Patients of jaundice with shock in malaria has grave prognosis than patient without jaundice. 30.2% patient with jaundice had thrombocytopenia while thrombocytopenia was present in 13.55% of patient of without jaundice. Mortality in patient of jaundice with thrombocytopenia was 12.5% as compared to patient without jaundice with thrombocytopenia in which mortality was 0.

**Table : 5 Distribution of the study population according to multi-organ system involvement and mortality.**

<table>
<thead>
<tr>
<th>System involvement beside jaundice</th>
<th>Total no. of patient (n=53)</th>
<th>No. expired patients(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only jaundice</td>
<td>42(79.24%)</td>
<td>0%</td>
</tr>
<tr>
<td>Jaundice + 1 organ system</td>
<td>5(9.44%)</td>
<td>1(20%)</td>
</tr>
<tr>
<td>involvement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jaundice + 2 organ system</td>
<td>4(7.55%)</td>
<td>1(25%)</td>
</tr>
<tr>
<td>involvement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jaundice + 3 organ system</td>
<td>1(1.89%)</td>
<td>1(100%)</td>
</tr>
<tr>
<td>involvement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jaundice + 4 organ system</td>
<td>1(1.89%)</td>
<td>1(100%)</td>
</tr>
<tr>
<td>involvement</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Mortality with 1 organ system involvement was 20%, 2 organ system involvement were 25%, with 3 & 4 organ system involvement were 100%.

**DISCUSSION**

Maximum patient (37%), were in 15-24 years age group, which was comparable with the study of M.K.Mohapatra et al\(^4\) who found 40% of patient affected in same age group. Mean age of the patient was 31.77 years, which is similar to observation found in study done by B.S.Patil et al\(^5\) who found 32.81 years of mean age in his study. In our study 76.5% patients were males while 23.5% were females. Out of 53 patients with Jaundice, 45 patients (84.90%) had S. Billirubin 3-6 mg% which correlates with study of Kochar D at el\(^6\) in which maximum no of patients 40%, 5 patients (9.43%) had S. Billirubin 6-10 mg% and 3 patients (5.67%) had S. Billirubin >10 mg% which correlates with study of Chawla et al\(^7\) 45.2% and with study of Anand at el\(^8\) 41%. The mortality in patients with S. Billirubin level of 3-6 mg%, 6-10mg% and >10mg% was 1.89%. In patient of jaundice with malaria mortality doesn’t increase as serum billirubin increase. More than half (58.5%) patients of jaundice had direct hyperbilirubinemia and 41.5% of patient has indirect hyperbilirubinemia so statistically significant number of patient with jaundice had direct hyperbilirubinemia which correlates with study of Harris V K et al\(^9\), where it was present in 72% cases. Mortality was 5.67% in patient of direct hyperbilirubinemia and 0% in patient with indirect hyperbilirubinemia. Incidence of ARF in patients with jaundice was 13.28%. Mortality in patients of jaundice with ARF was 12.5% and in patient without jaundice is 0. In present study 7.54% patient with jaundice had ARDS while ARDS was present in 0.57% of patient without jaundice. In study of Aursudkij B et al\(^10\) ARDS was present in 7.54% patient with jaundice. Mortality in patient of jaundice with ARDS was 50% as compared to patient without jaundice with ARDS in which mortality was 0. This suggests that presence of ARDS with jaundice in malaria significantly increase mortality. In present study 3.78% patients with jaundice had shock (SBP<90mmhg) while shock was present in 1.15% of patient without jaundice. In study of Aursudkij B et al\(^10\) shock was present in 2.4% patient with jaundice. Mortality is present in 100% patient of shock with jaundice, while it was 0% in patients with shock but no jaundice. Patients of jaundice with shock in malaria has grave prognosis than patients without jaundice. Near about one third (30.2%) patient with jaundice had thrombocytopenia while thrombocytopenia was present in 13.55% of patient of without jaundice. Mortality in patient of jaundice with thrombocytopenia was 12.5% as compared to patient without jaundice with thrombocytopenia in which mortality was 0. Mortality with 1 organ system involvement was 20%, 2 organ system involvement were 25%, with 3 &
4 organ system involvement were 100%. So, the mortality was significantly higher in patients with multiorgan failure than with no organ involvement which was correlating with study of M K Mohapatra et al \(^4\) \(^5\) \(^6\) in one complication it was 14.6% in 2 complications it was 21.3%, in 3 complication it was 30.9%, in 4 complication it was 38.5%.

**CONCLUSIONS**

- Jaundice is more common in age group of 15-24 years of age group.
- 100% mortality was seen in patient having jaundice with shock (SBP<90mmgh)
- Mortality in patient having thrombocytopenia with jaundice was also high as compared to mortality with patient without jaundice.
- 50% mortality was recorded in patient of jaundice with ARDS.
- 100% mortality seen in patient seen in 3 and 4 organ system dysfunction while 25 and 20 % mortality was seen in patient with 2 or 1 organ system dysfunction respectively.

We can conclude that presence of Jaundice is poor Prognostic marker in malaria.

**Contributors:** B.M conceived the idea, collected data, analysed and prepared the initial draft of the paper. T.P and A.V supervised the data collection and provided support, encouragement and administrative help to carry out this study. A.G, S.G, A.V and P.V helped in analysis and drafting the manuscript.

**Funding:** Nil

**Conflict of interest:** None

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