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INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI: 10.21474/IJAR01/18839
DOI URL: http://dx.doi.org/10.21474/IJAR01/18839

RESEARCH ARTICLE

CLINICAL STUDY TO CORRELATE THE COMPLICATIONS OF MALARIA WITH PARASITE LOAD AND C - REACTIVE PROTEIN AT THE TIME OF PRESENTATION

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Manuscript Info

Manuscript History
Received: 31 March 2024
Final Accepted: 30 April 2024
Published: May 2024

Abstract

Introduction: Malaria, an important tropical parasitic disease with respect to annual mortality all over the world is becoming an important research area. About 300-500 million cases are being reported every year across the globe, killing one million people per year. 77% of the burden of malaria in south east Asia is from India . Development of complications, leads to severe malaria, that has higher mortality and morbidity. Due to rapid multiplication, the parasite count may rise up to 20-fold over a span of 48 hours without treatment. Patients with high parasite load have a complicated course. This study aim was to correlate complications of malaria with parasite load and C-Reactive Protein (CRP) value at the time of presentation.

Materials And Methods: This is a hospital based, cross sectional study done in DR Balasaheb Vikhe Patil Rural Medical College, Loni, Maharsthra, which included 100 consecutive cases of malaria diagnosed through peripheral smear. Patients above 18 years of age without prior co-morbidities were included.

Aims and Objectives: To study the Correlation between the Complications of Malaria with Parasite Load and C - Reactive Protein at the Time of Presentation.

Results: A total of 100 patients with malaria who satisfied the inclusion criteria were enrolled of which 84 were male and 16 were female. Most of them were between age group 21-40 years. Of total 100 cases, 72 were vivax malaria, 18 were falciparum malaria and 10 were mixed malaria positive. Complications were seen in 32 cases , of which 17 had vivax, 9 had falciparum and 6 had mixed malaria. -25 patients had higyh CRP (>100mg/dl). -86 Patients had low parasitemia (<5%) and 14 patients had high parasitemia (>5%). Patients were divided into two groups of high parasitemia (>5%) and low parasitemia (<5%)

Conclusion: Complications of malaria show a positive correlation with high parasite load and high CRP values. Monitoring of treatment and response to anti malaria therapy can be done using parasite load and CRP values. Based on our study vivax malaria can no longer be considered as uncomplicated.

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Introduction:-

Malaria, an important tropical parasitic disease with respect to annual mortality all over the world is becoming an important research area. About 300-500 million cases are being reported every year across the globe, killing one million people per year. 77% of the burden of malaria in south east Asia is from India . Development of complications, leads to severe malaria, that has higher mortality and morbidity. Due to rapid multiplication, the parasite count may rise up to 20-fold over a span of 48 hours without treatment. Patients with high parasite load have a complicated course. This study aim was to correlate complications of malaria with parasite load and C-Reactive Protein (CRP) value at the time of presentation.

Aims and Objective:-

To study the Correlation between the Complications of Malaria with Parasite Load and C - Reactive Protein at the Time of Presentation.

Inclusion Criteria

1. Patients admitted to Dr. Balasaheb Vikhe Patil Rural medical college and diagnosed as cases of Malaria
2. Patients above 18 years of age.

Exclusion Criteria

1. Patients with known comorbidities such as Diabetes Mellitus, Hypertension, Tuberculosis, Bronchial asthma.
2. Patients with any other source of infections causing fever and raise of CRP.

Materials and Methods:-

•This is a hospital based, cross sectional study done in DR Balasaheb Vikhe Patil Rural Medical College, Loni, Maharsthra, which included 100 consecutive cases of malaria diagnosed through peripheral smear.

• Patients above 18 years of age without prior co-morbidities were included. Institutional ethics committee clearance and informed consent were obtained prior to the study.

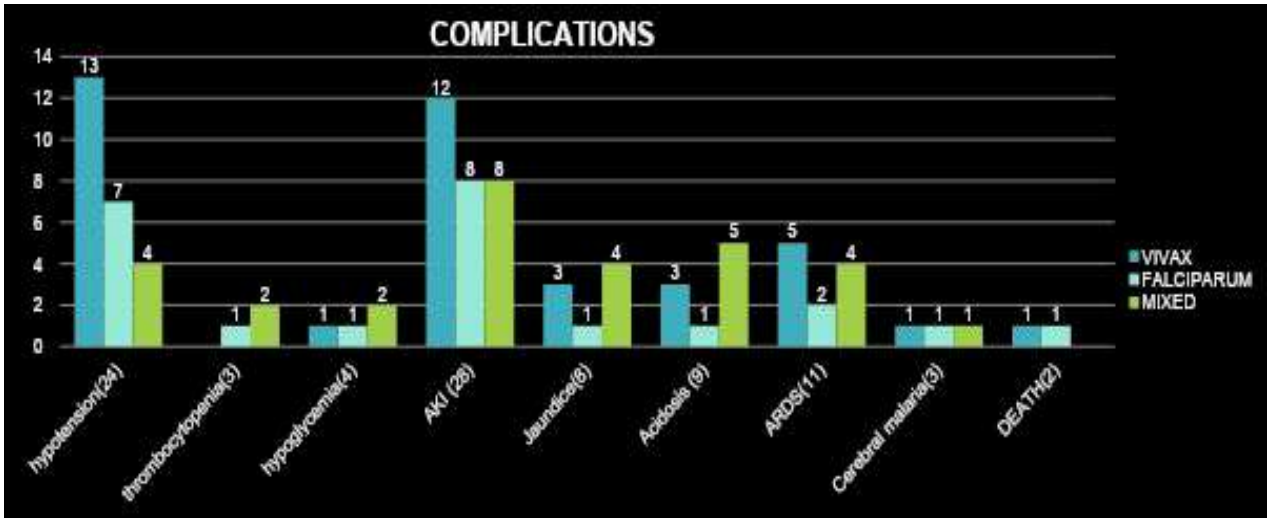
• History, clinical examination and blood investigations namely hemoglobin, creatinine, random blood sugar, total bilirubin, serum bicarbonate, CRP, parasite load using peripheral smear were recorded.

•All patients were treated according to the WHO treatment protocol. The parasitemia level was calculated and expressed as percentage (%) of erythrocytes infected with malarial parasites5

• % of Parasitemia = Number of parasitized RBCs / NUMBER OF RBC'S COUNTED

Results:-

A total of 100 patients with malaria who satisfied the inclusion criteria were enrolled of which 84 were male and 16 were female. Most of them were between age group 21-40 years. Of total 100 cases, 72 were vivax malaria, 18 were falciparum malaria and 10 were mixed malaria positive. Complications were seen in 32 cases (Figure 1), of which 17 had vivax, 9 had falciparum and 6 had mixed malaria.



25 patients had higyh CRP (>100mg/dl).
Correlation between complications of malaria and CRP is shown in Table 1

COMPLICATIONS	HIGH CRP (n= 25)	LOW CRP (n=75)	'p' value
• Hypotension	20(80%)	4(5.3%)	<0.05
• Thrombocytopenia	3(12%)	0	0.002
• Hypoglycemia	4(16%)	0	<0.05
• Acute Kidney Injury	25(100%)	3(4.0%)	<0.05
• Jaundice	7(28%)	1(1.3%)	<0.05
• Acidosis	9(36%)	0	<0.05
• ARDS	11(44%)	0	0.002
• Cerebral malaria	3(12%)	0	0.002
• Death	2(8.0%)	0	0.002

86 Patients had low parasitemia (<5%) and 14 patients had high parasitemia (>5%). Patients were divided into two groups of high parasitemia (>5%) and low parasitemia (<5%) and the data analyzed is depicted in Table 2.

COMPLICATIONS	HIGH PARASITEMIA (>5%) (n= 14)	LOW PARASITEMIA (<5%) n=86	'p' value
• Hypotension	12(85.7%)	12(13.9%)	<0.05
• Thrombocytopenia	2(14.3%)	1(1.2%)	0.008
• Hypoglycemia	3(21.4%)	1(1.2%)	<0.05
• Acute Kidney Injury	14(100%)	14(16.27%)	<0.05
• Jaundice	6(42.9%)	2(2.3%)	<0.05
• Acidosis	8(57.1%)	1(1.2%)	<0.05
• ARDS	10(71.2%)	1(1.2%)	0.002
• Cerebral malaria	3(21.4%)	0	0.002
• Death	2(14.2%)	0	

Correlation of Parasitic Load, CRP and Complications.

COMPLICATIONS	HIGH PARASITEMIA (>5%) (n= 14)	HIGH CRP	LOW PARASITEMIA (<5%) n=86	HIGH CRP
• Hypotension	12(85.7%)	12	12(13.9%)	8
• Thrombocytopenia	2(14.3%)	2	1(1.2%)	1
• Hypoglycemia	3(21.4%)	3	1(1.2%)	1
• Acute Kidney Injury	14(100%)	14	14(16.27%)	10
• Jaundice	6(42.9%)	6	2(2.3%)	1
• Acidosis	8(57.1%)	8	1(1.2%)	1
• ARDS	10(71.2%)	10	1(1.2%)	1
• Cerebral malaria	3(21.4%)	3	0	0
• Death	2(14.2%)	2	0	0

Discussion:-

Malaria is a tropical disease caused by protozoa of genus Plasmodium with 4 species namely P.vivax, P. falciparum, P. ovale and P. malariae. P. vivax accounts for >50% of all cases in Asia and Latin America. Koh KH, et al., demonstrated that P. vivax is responsible for up to 50% of malaria cases in South-East Asian population. In this study P. vivax (72%) was the commonest species causing malaria then falciparum (18%) and mixed (10%) infection. The clinical features ranged from fever associated with chills and rigors to headache, vomiting, malaise and myalgia. These are nonspecific symptoms and difficult to be distinguished reliably from other febrile illnesses.8,9.10 Most of the complications are seen with P. vivax malaria patients and majority of those complications are associated with high parasitemia and high CRP. More common and frequent complications being hypotension, AKI, ARDS and cerebral malaria are found to be more serious complications and more commonly seen in vivax malaria patients in my study. So vivax malaria should no longer be considered benign and complications if any have to be seriously and aggressively treated at the earliest. Among the acute phase proteins, CRP, Amyloid A have optimal kinetics with rapid elevation to very high levels and subsequent rapid fall during recovery. CRP is an ideal markers to identify complications in the early stages and thus gives advantage for cost-effective and reliable tool in assessment of prognosis in malaria.

Conclusion:-

Complications of malaria show a positive correlation with high parasite load and high CRP values. Monitoring of treatment and response to anti malaria therapy can be done using parasite load and CRP values. Based on our study vivax malaria can no longer be considered as uncomplicated.

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