



STUDY OF CLINICAL SPECTRUM AND OUTCOME IN 100 PATIENTS OF P.VIVAX MALARIA ADMITTED IN SHETH L.G. HOSPITAL, AHMEDABAD.

General Medicine

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ABSTRACT

Background: Malaria is a major health problem in india . it is one of the biggest burdens in terms of morbidity and mortality. Malaria pathogenesis is based mainly on extensive changes in haematological and biochemical parameters.

Aim:

- 1) To study the spectrum of disease
- 2) To study the complication
- 3) To study prognosis and outcome in Malaria

Method: This observational study enrolled Total of 100 cases of P.Vivax Malaria (63 male and 37 female).Detailed examination and routine investigation were carried out.All patients were screened for complication.

Result: This observational study reveals male predominance.Large number of patients belonged to age group 20-40 years. Fever was intermittent in most of cases. Thrombocytopenia was remarkably common and was found in 80% with 8% of patients had severe thrombocytopenia.Reversible renal impairment (serum creatinine >3 mg%) was found in 15 patients but none of them required hemodialysis or exchange transfusion.

Conclusion: Although a benign disease in majority ,vivax malaria dose have a propensity to cause complications.

KEYWORDS

malaria ,liver, kidney, hemoglobin , thrombocytopenia

INTRODUCTION

Malaria is emerged as one of the top 10 killer diseases around the globe. It is well-known to human being since centuries; it is a disease of tropical and subtropical countries particularly Africa and Asia.

In spite of advances information, malaria continues to cause significant morbidity and mortality worldwide.

Malaria is one of the most prevailing human infections in the world. More than 40% of the world population reside in malaria-endemic area and it is predictable that 300-500 million cases and 1.5-2.7 million deaths occur each year.

Mortality rate is usually elevated in severe malaria and complicated malaria.

Hematological changes, which are the most common complications, play a significant role in these serious complications.

The hematological and biochemical abnormalities that have been reported to consistently companion which comprise anemia, thrombocytopenia, atypical lymphocytosis and infrequently disseminated intravascular coagulation, altered liver and renal functions and metabolic acidosis.

Malaria can affect single or multiple organs with different level of severity which can be determined as neurologic and renal dysfunction, haematological, cardiovascular and respiratory dysfunction as well as hepatic and metabolic dysfunction. This study is an attempt to investigate the effects of malaria in infected patients which were admitted in AMC MEDICAL COLLEGE and HOSPITAL, AHMEDABAD.

Aim:

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- 2) To study the complication
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MATERIALS & METHODS

Study Type: Observational study.

Sample size : 100 cases of smear positive.P.Vivax malaria.

Study area : The cases were taken which were admitted to L.G.general hospital for the period of two months (june - july 2018).

EXCLUSION CRIETERIA :

- Patients with other causes for fever and with coexisting infections were excluded from this study. Patients with other tropical illnesses including dengue, typhoid, scrub typhus were excluded from this study.
- Patients less than 20 years age.

Selection of Patients

INCLUSION CRITERIA :

- Patients between >20 years of age.
- Smear positive P.Vivax malaria patients.

STUDY DESIGN

In this observational study, all patients who presented with fever were evaluated for malaria by examining peripheral smear. The patients with positive peripheral smear for P.Vivax malaria were enrolled in study.

Detailed medical history and examination conducted to study

- Common symptoms
- Pattern of fever
- Bleeding diathesis
- Other complications

Laboratory Examinations

Complete haemogram including total counts,platelets count, haemoglobin, peripheral smear(thick and thin)

Blood chemistry: Blood glucose,renal functions,serum electrolytes

- Liver function test with enzymes
- PT with INR

Following investigations were done, whenever indicated:

Chest X-ray, ECG standard 12 leads, USG abdomen and pelvis, ABGA whenever needed, neuroimaging, EEG and CSF examination.

Medical Management

Antimalarial Drugs

Patients with the P. vivax malaria were given antimalarial treatment according to WHO guidelines.

Supportive Treatment

- To control the fever, antipyretics were given. Platelet transfusions were planned only if platelet count fell below 10,000/mm³ or if low platelet count was associated with bleeding from any site. PCV transfusions were given if their Hb fell to <7 g%.
- After starting the treatment, time taken for a particular patient to become afebrile was noted. Patient's hospital stay was also noted in terms of days. Patients were reassessed periodically during hospital stay and after discharge at six weeks.

RESULTS & DISCUSSION:

The present study enrolled 100 cases of P. Vivax malaria in hospitalized patients in large tertiary care center.

Table 1 : Incidence of P.Vivax Malaria according to Age group

Age (Years)	Number of cases	Percentage(%)
<20	5	5
20-40	70	70
40-60	18	18
>60	7	7

In the present study, age groups most commonly affected were 20-40 years(70%) and 40-60 years(18%). (TABLE 1)

Table 2 : Incidence of P.Vivax malaria according to sex

Sex	Number of cases	Incidence	Ratio
Female	37	37	1.7:1
Male	63	63	

In the present study, males were more commonly affected(63%) than the females. Males were also more frequently exposed to the risk of acquiring malaria than females because of outdoor life, they lead. Further, females in India are usually better clothed than males. (TABLE 2)

Table 3 : Temperature at Time of Admission

Temperature(°F)	Number of cases	Percentage(%)
98.9-99.9	12	12
100-100.9	60	60
101-101.9	17	17
>102	11	11

Pattern of Fever :

The present study shows that the fever pattern in P. vivax malaria is mostly of intermittent type.

- All the clinical features of malaria are caused by the erythrocytic schizogony in the blood.
- The rupture of red blood cells by merozoites releases certain factors and toxins which could directly induce the release of cytokines such as TNF and interleukin-1 (IL-1) from macrophages, resulting in chills and high grade fever.
- This occurs once in 48 hours, corresponding to the erythrocytic cycle. In the initial stages of the illness, this classical pattern may not be seen because there could be multiple groups (broods) of the parasite developing at different times, and as the disease progresses, these broods synchronizes and the classical pattern of alternate day fever is established.
- Most of the patients had temperature of 100-100.9°F at the time of admission. None of patients presented with hyperpyrexia (Table 3).

Table. 4 Frequency of Symptoms in P.Vivax Malaria

Symptoms	Present in cases (%)
Fever	100
Nausea	90
Rigor	89.28
Vomiting	82.14
Headache	71.42
Bodyache	71.42
Abdominal pain	53.84
Yellow Sclera/Urine	39.67
Loss of Consciousness	6.65
Oliguria	5.66

Red Urine	5.66
Breathlessness	4.25
Bleeding	1.41
Convulsion	1.41
Diarrhea	1.41
Skin Rashes	0

Apart from the fever, the most common symptoms associated with fever were: Headache (60%), bodyache (60%), nausea (85.7%) and vomiting (69%)(TABLE 4)

Table 5. Hemoglobin Level in Patients with the P. vivax Malaria

Hb(gm%)	No. of patients
<5	NILL
5-10	59
>10	41

In present study, none of patients had severe anemia (Hb <5 g%) and 59% of patients had moderate anemia (Hb between 5-10 g%) Transfusion of PCV was required in three patients.

The possible mechanisms for anemia are invasion and destruction of reticulocytes by P. vivax; increased fragility of infected and noninfected RBCs; possible pooling of RBCs in the spleen. Although serum ferritin level normal and stool for occult blood negative. Possibility of existing anemia can not be ruled out.(TABLE 5)

Table 6. Platelet Count in Patients with P. vivax Malaria

Platelets	%
<50000	8
50000-100000	80
>100000	12

The present study found severe thrombocytopenia (<50,000) in 8% of cases, moderate thrombocytopenia (50,000-1,00,000) in 80% of cases and mild thrombocytopenia (1,00,000-15,00,000) in 12% of cases. The platelet counts were within normal limits in only 10.7% of cases (Table 6). All patients with severe thrombocytopenia were investigated for dengue serology, but reports were negative. Pseudothrombocytopenia was ruled out by reviewing peripheral blood smear and exact platelet count determined from blood collected into sodium citrate or heparin. Thrombocytopenia is a well-recognized complication of falciparum malaria but has been less well-described in vivax malaria. The mechanism of thrombocytopenia in P. vivax malaria is not clearly known. With several hypothesis on the way, however, thrombocytopenia in P. vivax still remains an enigmatic finding. Possible mechanisms includes, both nonimmunological destruction as well as immune mechanisms, oxidative stress damage of thrombocytes and splenic destruction.

Table 7. Random Blood Sugar in Patients with P. vivax Malaria

Random blood sugar(gm%)	Number of cases
<60	8
60-100	45
100-140	35
>140	12

In the present study, hypoglycemia (<60 g%) was found in 8% of cases. However, none of the patient had blood sugar <40 g% to classify as severe malaria as per WHO (Table 7). Hypoglycemia in P. vivax malaria seems to be due to failure of hepatic gluconeogenesis, increased consumption by malarial parasite, glycogen depletion and impaired gluconeogenesis and increased metabolic demand for pyrexia.

Table 8. Serum Creatinine in Patients with P. vivax Malaria

Serum creatinine(mg%)	Number of patients	Percentage(%)
<1.2	62	62
1.2-3.0	23	23
>3.0	15	15

About 62% of patients had serum creatinine levels <1.2 mg%; of these, 15% had serum creatinine >3.0 mg% (Table 8). None of the patients had history of hypertension or diabetes, or other predisposing risk factors for chronic renal impairment. All patients with renal impairment had urea/creatinine ratio >20.

All the patients recovered with antimalarial medicines and none of the

patients required hemodialysis or exchange transfusion. Renal involvement in *P. vivax* malaria seems to be due to renal ischemia and acute tubular necrosis caused by increased vascular response by increased catecholamines and renin.

Table 9. Serum Bilirubin in Patients with *P. vivax* Malaria

Serum bilirubin(mg%)	Number of patients	Percentage(%)
<1.2	60	60
1.2-3.0	28	28
>3.0	12	12

Table 10. Serum SGPT in Patients with *P. vivax* Malaria

Serum SGPT(units/ml)	Number of cases	Percentage(%)
<35	70	70
36-70	21	21
71-105	5	5
>105	4	4

In the present study, serum bilirubin >1.2 mg% was found in 40% of cases, 12% had serum bilirubin >3.0 g% (Table 9). Altered liver function tests in *P. vivax* malaria result from sequestration of parasitized RBCs, hemolysis, as well as from the end-organ damage caused by alterations in hemodynamics. Elevated SGPT was found in about 30% of cases. Out of which, a value of SGPT more than three times of normal was found in only 4% of cases (Table 10). Altered liver enzymes gradually normalize with antimalarial treatment only. None of the patient had history of chronic liver disease, alcohol intake, and viral markers were negative. Patients with altered liver and renal function underwent USG examination, which were normal.

DISCUSSION

- This observation study showed that males were more commonly affected compared to women; 70% of the patients were between the age group of 20-40 years.
- Fever is the most common symptom and majority of the patients presented between 1-4 days of the onset of the symptoms. None of the patient had hyperpyrexia at the time of admission. The fever pattern was of intermittent type.
- Out of the various laboratory abnormalities, thrombocytopenia was remarkably common and was found in 88%. Of total subjects, 8% of these patients had severe thrombocytopenia, although none of the patients required platelet transfusion. The mechanism of thrombocytopenia in *P. vivax* malaria is not clearly known. Both immunological and nonimmunological mechanisms and oxidative stress have been implicated in the pathogenesis.
- Fifteen patients had renal impairment (serum creatinine >3 mg%), but none of them required hemodialysis or exchange transfusion. Mild elevations in serum bilirubin and liver enzymes were found, which normalized within few days without any specific treatment.
- Metabolic acidosis was found in two patients. None of the patients presented with ARDS. Three of the patients with altered sensorium, out of which two had seizures, were evaluated for alternative or additional diagnosis, with negative results, except for the positive peripheral smear for trophozoites of *P. vivax*. Concomitant infection with *P. falciparum* was found in six subjects.
- The antimalarial therapy according to WHO guidelines was found to be highly effective. In most of the patients the peripheral smear became negative within 24 hours of starting treatment and most of the patients became afebrile after Day 1. The average duration of hospitalization was found to be of between 1-4 days. Those patients who required 5-7 days of hospitalization had altered biochemical and hematological parameters which required normalization before discharge.

CONCLUSIONS

P. vivax malaria is a benign disease in majority but complications do occur. Epidemiologic studies and clinical descriptions of complicated *P. vivax* malaria in adults living in malaria epidemic areas are sparse. Recent advances have thrown insight into this less common but not unknown complications of *P. vivax* malaria. Further large scale multicentric epidemiologic and clinical studies are needed to understand the pathology of *P. vivax* malaria.

REFERENCES

- 1) Park's Textbook of Preventive and Social Medicines. (24th edition)
- 2) Harrison Principles of Internal Medicines. (20th edition.)
- 3) Trends in Parasitology, Volume 25, Issue

- 4) Manson's Tropical Diseases. 23rd edition.
- 5) Sachdev HP, Mohan M. Vivax cerebral malaria. *J Trop Pediatr* 1985;31:213-5.
- 6) Ozen M, Gungor S, Atambay M, Daldal N. Cerebral malaria owing to *Plasmodium vivax*: case report. *Am J Pediatr* 2006;26:141-4.
- 7) Sarkar S, Bhattacharya P. Cerebral malaria caused by *Plasmodium vivax* in adult subjects. *Indian J Crit Care Med* 2008;12(4):204-5.
- 8) WHO Treatment Guidelines, edition 3rd, 2015.