

Research Article

An audit of malarial parasites and hematologic profile of malarial patients

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ABSTRACT

Objective: To find out the frequency of malarial parasites and hematologic profile of malarial patients.

Material and methods: This cross sectional was conducted at Department of Pathology, Quaid-e-Azam Medical College/Bahawal Victoria Hospital, Bahawalpur from April 2018 to October 2018 over the period of 6 months. Total 100 patients of malaria having age >20 years wither male or female were selected for present study from Department of Medicine of Bahawal Victoria Hospital, Bahawalpur. Malarial patients were assessed for hematologic profile.

Results: Out of 100 patients of malaria, *P. Vivax* was found in 55 (55%) patients and *P. Falciparum* was found in 45 (45%) patients. Most of the cases (57%) were in the adults between 21-40 years age group. Male patients were 57 (57%) and female patients were 43 (43%). Pallor was the most common clinical sign noted in 55 (55%) patients followed by Icterus in 11 (11%) patients, Pedal edema in 5 (5%) patients, Splenomegaly in 32 (32%) patients, hepatomegaly in 20 (20%) patients, Hepatosplenomegaly in 17 (17%) patients and CNS involvement in 4 (4%) patients.

Conclusion: Results of present study showed that males were more victim of malaria infection as compared to females. In most the patients *P. vivax* was seen and pallor was the most common clinical sign.

Keywords:Thrombocytopenia, malaria, *P. falciparum*, *P. vivax*

INTRODUCTION

Malaria continues to be a great health problem in some of the most populated areas of the world. Infection is caused by a parasite of genus *Plasmodium* which is transmitted to human beings by infected female anopheles mosquito.¹ *P. falciparum* is the predominant species.² Studies have revealed that hematologic and biochemical changes occur in malaria infected blood and there are common complications associated with this disease. Hematological changes that are associated

with malaria infection include anemia, thrombocytopenia, and disseminated intravascular coagulation.³⁻⁴

Thrombocytopenia is common occurrence in acute malaria and it is observed in vivax and falciparum malaria to varying degrees.⁵ Cases of malaria associated renal and hepatic impairment have been reported from different parts of malaria endemic countries.⁶ Hepatic involvement in *P. falciparum* malaria is not an uncommon presentation and

presence of jaundice (bilirubin >3mg/dl) is one of the indicators of severe malaria as defined by the WHO. Jaundice in falciparum malaria may vary from mild to severe and is associated with high incidence of complications and mortality.⁷

There are two major renal syndromes associated with Malaria. (1) A chronic and progressive glomerulopathy that mainly affects African children, classically complicating quartan malaria and (2) ARF associated with falciparum malaria in Asia and sub-Saharan Africa.⁸ Renal impairment is commonly caused by *P. falciparum*; however, vivax malaria also causes renal impairment.⁹

Hence the present study is undertaken to evaluate the various haematological parameters as well as biochemical parameters affected in malaria and to observe the variations if any, in *P. falciparum*, *P. vivax* and mixed infections. The aim of the study is to study the changes in haematological parameters in smear positive malaria cases. To study the changes in biochemical parameters in smear positive malaria cases.

MATERIAL AND METHODS

This cross sectional was conducted at Department of Pathology, Qaid-e-Azam Medical College/Bahawal Victoria Hospital, Bahawalpur from April 2018 to October 2018 over the period of 6 months.

This study was approved by ethical committee of the institution and written informed consent was taken from every patient. Total 100 patients of malaria having age >20 years wither male or female were selected for present study from Department of Medicine of Bahawal Victoria Hospital, Bahawalpur.

Blood sample of all the selected was taken and sent to laboratory of the institution for analysis.

Collection of blood

CBC was carried out on Mythic 18 Automated Hematology Cell Counter and following readings were noted.

- Hemoglobin (HB%)
- HCT
- Total leukocyte count (TLC)

- Differential leukocyte
- Platelet count.

Biochemical Investigations

Liver function test (LFT)

The patient's samples were processed for Liver function tests including-Serum Bilirubin, AST, ALT with the help of Fully Automated Biochemistry Analyser.

Kidney function test (KFT)

The patient's samples were processed for Kidney function tests including-Serum creatinine and blood urea with the help of Fully Automated Biochemistry Analyser Erba-640.

Peripheral blood smear examination

Peripheral blood smears were prepared using fresh finger prick blood. One drop of blood placed on one side of the slide 1 cm away from end and blood was spread using a spreader slide at angle of 30 degree over the length of slide then slides were left to air dry. Slides were fixed and stained with Leishman stain. Peripheral blood smear examination was done systematically under low, high and oil immersion of microscope for

- RBC morphology
- Total leukocyte count and differential count
- Platelet adequacy
- Type of malaria parasite.

All the collected data was entered in SPSS and analyzed. Mean and SD was calculated for numerical data and frequencies and percentages were calculated for categorical data.

RESULTS

Out of 100 patients of malaria, *P. Vivax* was found in 55 (55%) patients and *P. Falciparum* was found in 45 (45%) patients. (Fig. 1) Most of the cases (57%) were in the adults between 21-40 years age group. Male patients were 57 (57%) and female patients were 43 (43%). (Fig. 2)

Fever was seen in all cases except one case. Chills and rigor was the next commonest symptom seen in 64% of the cases. Nausea and vomiting was present in 25 cases out of which majority (16

cases) were due to falciparum malaria. Myalgia was present in 14% of cases. Altered sensorium was seen in 3 cases of falciparum and 1 case of vivax infections.

Pallor was the most common clinical sign noted in 55 (55%) patients followed by Icterus in 11 (11%) patients, Pedal edema in 5 (5%) patients, Splenomegaly in 32 (32%) patients, hepatomegaly in 20 (20%) patients, Hepatosplenomegaly in 17 (17%) patients and CNS involvement in 4 (4%) patients. (Table 1)

Thrombocytopenia was noted in 71 (71%) patients and Normal platelet count (more than 1.5lakhs/mm³) was found in 29 (29%) patients. (Table 2)

Majority of the patients had normal Total WBC count (72%).Reduced WBC count was seen in

18% of the cases and increased counts in 10%, with near equal distribution in vivax and falciparum malaria. Increased WBC count seen in 10% of cases.5 cases of increased neutrophil count were seen, with more in vivax infection (4 cases).

Reduced neutrophil count was seen in 12 cases with equal distribution in vivax and falciparum malaria cases. One case of eosinophilia and 6 cases of lymphocytosis were seen in falciparum malaria cases. Two cases of lymphocytosis were seen in vivax infection. Seventy-four cases showed normal differential count.

In anemic patients, most commonly RBC's were Normocytic Normochromic (64.55%) followed by Microcytic Hypochromic (29.11%) Microcytic Hypochromic blood picture was seen nearly equal in both falciparum and vivax infection.

Fig. 1: Type of parasite

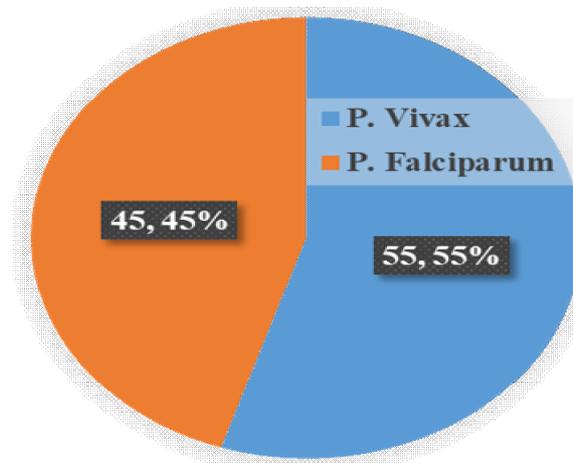


Fig. 2: Gender Distribution

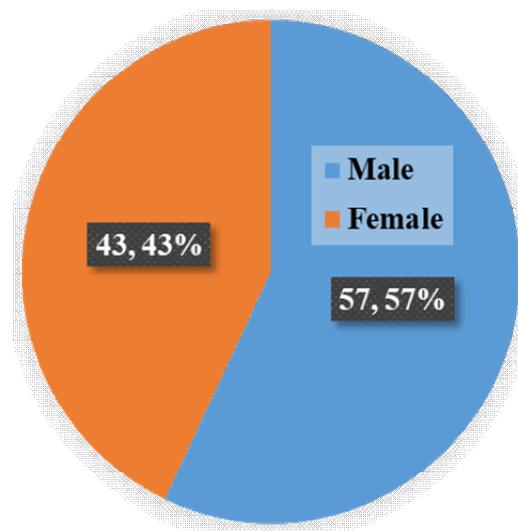


Table 1: Distribution of patients according to clinical signs

Sign	N (%)
Pallor	55 (55%)
Icterus	11 (11%)
Pedal edema	5 (5%)
Splenomegaly	32 (32%)
Hepatomegaly	20 (20%)
Hepatosplenomegaly	17 (17%)
CNS involvement	4 (4%)

Table 2: Platelet count.

Platelet count	Total %
Thrombocytopenia (less than 1.5laks/mm3)	71 (71%)
Normal platelet count (more than 1.5laks/mm3)	29 (29%)

DISCUSSION

The most common species of malaria in the present study was vivax (55%) followed by falciparum (45%). Erhart LM et al, Jadhav UM et al also reported vivax as most common species which in agreement with our study.¹⁰⁻¹¹ But Bashawri reported falciparum as most common species.¹² Present study had 57% male patients as compare to 45% female patients. Other studies with comparable results include Jadhav UM et al¹¹ with 58.3% males, Erhart LM¹⁰ et al with 69% males and Bashawri LAM¹² et al with 75.9% males.

In present study, Fever was the commonest presenting symptom in 99% of the patients. Chills and rigor was present in 64% of the patients. Nausea and vomiting was seen in 25% of the patients.

Headache was seen in 22% of the patients while Altered Sensorium was seen in 4% of patients. In present study, Pallor was seen in 55% followed by splenomegaly in 32% of cases, hepatomegaly in 20%, Icterus in 11% and CNS involvement in form of seizures and altered sensorium in 4%, and Pedal oedema in 5% of the patients.

Variations in different studies may be due to some studies having concentrated only on malarial hepatitis and jaundice in malaria and others on hematological parameters only. Anaemia is a frequent finding in malaria cases, particularly in

developing nations. In the present study, anaemia (<11.5 gm %) was seen in 79% of the cases. In other studies carried out, Sharma Set al¹⁴ had anaemia in 86.7% of the cases, while in a study conducted by Biswas R et al,¹⁴ 94.4% of the cases had anaemia. In study conducted in Saudi Arabia, Bashawri LAM et al¹² had 59.2 % cases showing Anaemia. In the present study, the percentage of patients showing thrombocytopenia (<1.5 lacs) were 66.66% in case of falciparum malaria and 74.54% in case of vivax malaria.

The percentage of cases showing thrombocytopenia in falciparum infections and vivax infections varies in different studies. Studies conducted by Bashawri LAM et al¹² and Jhadav UM et al¹¹ had thrombocytopenia more in Vivax as in the present study while in study conducted by Erhart LM et al,¹⁰ thrombocytopenia is more in cases of falciparum malaria.

Thrombocytopenia is a common finding in cases of malaria both vivax and falciparum as shown by most of the studies conducted. In the present study thrombocytopenia was seen in 71% of all malaria cases. Study conducted by Richards MW et al had thrombocytopenia in 67% of the case.¹⁵

CONCLUSION

Results of present study showed that males were more victim of malaria infection as compared to females. In most of the patients P. vivax was seen and pallor was the most common clinical sign.

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