Original Article

HAEMOTOLOGICAL PATTERN ASSOSIATED TO DIFFERENT TYPES OF MALARIA

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Abstract

Objective: To assess the abnormalities of haemotological parameters associates to different types of malaria.

Design: Observational study.

Study Setting and Duration: Present study was carried out in the medicine department, of (LUH) Liaquat University of Medical and Health Sciences Hospital Hyderabad / Jamshoro from March 2013 to august 2013.

Method: All the cases after diagnosis having, tuberculosis, hepatitis, typhoid, dengue fever, pregnancy and diagnosis of meningitis excluded from the present study. Blood sample of the patients for CBC were sent to the diagnostic and research laboratory of liaquat medical University Hospital Hyderabad. After reports all the hematological abnormalities was documented.

Results: Total 200 patients were selected in this study, and mean age was found as; Mean ±SD 32.4 ± 5.6. Female were found in the majority 58%. Vivax was found most common in the cases with percentage of 68%. According to the haematological abnormalities, in the vivax infected patients abnormal Hb (g/dl) was found in (24.2%) cases and thrombocytopenia was found with the (20.4%) cases in the cases, while Falciparum infected patients mostly abnormal Hb (g/dl) was found in 27 (20.4%) and thrombocytopenia found most common 31 (45.5%) respectively.

Conclusion: In the conclusion of this study, there are a big haematological disturbance are evaluated in the malarial affected patients, mostly thrombocytopenia and anemia.

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Introduction

Malaria is one of the acute, chronic and frequent febrile health problems. Malaria is the common disease

founded due to the bite of the female Anopheles mosquito inoculating the sporozoites in the blood stream of the human most important to clinical demonstrations.[1] Malaria is associate with four species in the term of Plasmodium falciparum, Plasmodium vivax, Plasmodium ovale and Plasmodium malariae,[2] which are causing the malaria in humans. Malarial infection mostly found in human globally. According to the assessment of World Health Organization, globally 40% population has on great risk of malarial infection. Concerning 300 – 500 million populations found infected with the malarial infection.[3] Concerning two million people died caused by malaria and its complications in every year.[4] Our country Pakistan also having high malarial infection rate. According to the directorate of Malaria Control has mentioned that 1 person per thousand, infected with the malarial infection.[5] Dynamic transmission of the malaria happens as the year progressed, while forceful out blast of illness are seen chiefly amide and past in the season of monsoon.

The great quantity of mortality and morbidity is connected with infection of malaria. Results of the malaria in the loss of 35,728000, (Disability Adjusted Life Years) enlightening the influence, worldwide of that infection.[6] Contemplate the complication's gravity of this potentially treatable infection, it is very significant to diagnosis and treatment of the malarial infection earlier than it is moreover late. Microscopic diagnosis is the Gold standard to the malarial plasmadium investigation. It is not accurately diagnosed on a one slide, but having multiple slides are required. In the cases, those suffering due to acute febrile disease testing negative for malaria parasite, decision should, to give empirical anti malarial treatment is forever difficult. Thrombocytopenia is extremely correlate with malarial infection and has been stated by several research workers.[7,8] Malaria is associate of great presentations of high temperature along with haematological abnormalities like severe anaemia, thrombocytopenia and leucopoenia. Therefore the purpose of this study to evaluate the haemotological abnormalities associated to different types of malaria.

Material and Methods

This observational study has been carried out at the Medicine department of Liaquat Medical University Hospital Hyderabad and Muhammad Medical College Mirpur Khas. All the data was collected with duration of March 2013 to August 2013. Presenting detail history was taken, regarding duration of fever, severity of fever, vomiting and unconsciousness including sign / symptoms and previous antimalarial medicine history. Physical examination was done and ultrasound of whole abdomen was carried out specially to see the splenomegaly and hepatomegaly. All the cases with the diagnosis of, tuberculosis, hepatitis, typhoid, dengue fever, pregnancy and with meningitis have been excluded from the present study. The blood samples from all the cases were done for the complete blood count (CBC) and malaria parasite diagnosis. Blood sample of the patients for CBC were sent to the diagnostic and research laboratory of liaquat medical University Hospital Hyderabad. After reports all the hematological abnormalities were documented. All the data was collected and entered on the profrorma and was analyzed I the SPSS version 16.0.

Results

Total 200 patients were selected in this study, and mean age was found as; Mean ± SD 32.4 ± 5.6. Female were found in the majority 58%, as compare to the male 42%. Mostly 55% patients belong to the urban areas, while 45% of the patients belong to rural areas (**Table 1).**

Table 1: Basic Pattern of Patients (n = 200).

Basic Status	No. of Patients / Percentage
Age (Mean ± SD)	32.4 ± 5.6
Gender	
Male	84 (42.0%)
Female	116 (58.0%)
Residence	
Rural	90 (45.0%)
Urban	110 (55.0%)

On the clinical presentation patient's were distributed as: High grade Fever, Chills, Headache, Fits, Unconsciousness, nausea / vomiting Jaundice, Hepatomegaly and Splenomegaly with the percentage of (60.0%), (43.0%), (64.0%), (11.0%), (9.0%), (80.0%), (7.0%) , (19.0%) and (31.0%) respectively **(Table 2).**

Plasmodium vivax was appreciated most common

Table 2: Sign and Symptoms (n = 200).

Sign / Symptoms	No. of Patients / Percentage
High grade Fever	120 / (60.0%)
Chills	86 / (43.0%)
Headache	128 / (64.0%)
Fits	22 / (11.0%)
Unconsciousness Nausea/ vomiting Jaundice	18 / (9.0%)
Hepatomegaly Splenomegaly	160 / (80.0%)
	14 / (7.0%)
	38 / (19.0%)
	62 / (31.0%)

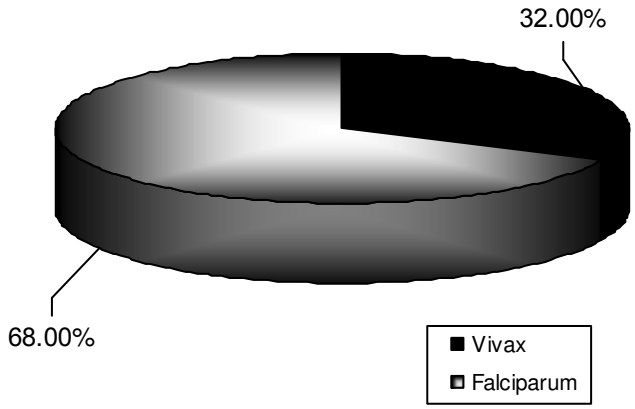

Fig. 1: *Distribution of Malaria Parasite (n = 200).*

in the cases with percentage of 68%, while Plasmodium falciparum was found 32% of the cases **(Fig. 1).**

According to the haematological abnormalities, in the vivax infected patients abnormal Hb (g/dl) was found (24.2%) of the cases, while abnormal Haematocrit (%), TLC ($\times10^9$/L), Neutrophils (%), Lymphocyte (%), Monocyte (%) and Platelets ($\times10^9$/L) were found with the percentage of 27 (20.4%), 20 (15.1%), 23 (17.4%), 23 (17.4%), 05 (3.7%) and 42 (31.8%) respectively (**Table 3).**

In the Falciparum infected patients abnormal Hb (g/dl) was found in 27 (20.4%) of the cases, while abnormal Haematocrit (%), TLC ($\times10^9$/L), Neutrophils (%), Lymphocyte (%), Monocyte (%) and Platelets ($\times10^9$/L) were found with the percentage of 20 (15.1%), 23 (17.4%), 15 (22.0%), 13 (19.1%), 02 (2.9%) and 31 (45.5%) respectively (**Table 3).**

Discussion

Several studies have reported the wide variation in the spreading of malaria in several places , that may be due to general features controlling mosquito breeding, education about health, prevention programs, and a genetic propensity for the expand immunity of malaria. In a study, it is reported that incidence of malaria in the patients with fever was 11.72%, and earlier studies that reported incidence of 34.2% in Central Balochistan,[3] and 47% in Karachi.[9] A study carried out by Khadim et al,[10] that showed malaria in 11.7% in the general population of Balochistan, which is the province adjoining Karachi, and according to Harani et al,[11] stated that malarial incidence was 12.85% in

Table 3: Haematological Pattern in Malarial Infected Patients (n = 200).

Haematological Parameter	Malaria Parasite			
	Vivax n = 132 (100%)		Falciparum n = 68 (100%)	
	Normal	Abnormal	Normal	Abnormal
Hb (g/dl)	100 (75.7%)	32 (24.2%)	41 (60.2%)	27 (20.4%)
Haematocrit (%)	105 (79.5%)	27 (20.4%)	48 (70.5%)	20 (15.1%)
TLC ($\times10^9$/L)	112 (84.8%)	20 (15.1%)	45 (66.1%)	23 (17.4%)
Neutrophils (%)	109 (82.5%)	23 (17.4%)	51 (75.0%)	15 (22.0%)
Lymphocyte (%)	109 (82.5%)	23 (17.4%)	55 (80.8%)	13 (19.1%)
Monocyte (%)	127 (96.2%)	05 (3.7%)	66 (97.0%)	02 (2.9%)
Platelets ($\times10^9$/L)	90 (68.1%)	42 (31.8%)	37 (54.4%)	31 (45.5%)

the patients with fever in Karachi.

Malik MA et al,[12] reported that the mean age of the patients was 21.7 + 16.46 years.

Similarly in the present study mean age was found as; Mean ± SD 32.4 ± 5.6. Female were found in the majority 58%, as compare to the male 42%.

Zeeba Shamim et al,[13] reported that in the positive malaria group, 121 males were in the majority and 51 females with the male\female ratio as; 2.3:1, with the presentation of mean age as; 29.2 years. These results also reported in some other studies, male\female ratio as 2.9:1.[14]

In the study of Azfar farogh et al,[15] reported that, he was found mostly cases with the presentations of, 98% fever, 60% associated rigors, chills 74%, 80% headache, 40% fits, 20% cases with unconsciousness, while bleeding history was occur in 4% cases, and according to investigations he also suggested 85% anaemia, 14% jaundice and 72% splenomegaly. In the study of Oh HM et al,[16] stated that the fever was mostly appreciated with the 60% rigors and 74% chills. in the results of another study stated of 40% jaundice and 80% hepatomegaly.[17] Rivera-matos IR et al,[18] suggested that enlarged spleen appreciated in 72% patients, Bashwari LA et al,[14] reported splenomegaly 9% and 18.8% splenomegaly reported by Hazra Bret al.[17] On the clinical presentation in the present study, High grade Fever, Chills, Headache, Fits, Unconsciousness, nausea / vomiting Jaundice, Hepatomegaly and Spleenomegaly with the percentage of (60.0%), (43.0%), (64.0%), (11.0%), (9.0%), (80.0%), (7.0%) , (19.0%) and (31.0%) respectively.

Azfar farogh et al,[15] stated in the laboratory investtigation majority of the cases found with 60% plasmodium and 40% falciparum. Reported by Sevenson et al,[19] that gives the figure of 62% vivax and 38% falciparum. Similarly in the present study vivax was found most common 68%, while falciparum was found 32%. In the study of Zeeba Shamimet al,[13] it is mentioned that, Plasmodium vivax was the most common 84.8%, in her study with the following of, 4.5% Plasmodim falciparum and 10.5% mixed infection of (both P. Vivax and P. falciparum). Although, other studies had suggested frequency of plasmodium vivax was 51.6%, 1.1% of p. falciparum, while 47.1% mixed infection of both plasmodium.[20]

Azfar farogh et al,[15] stated that thrombocytopaenia was found in 52% of the cases, 18% leucopaenia, 6% haemoglobinuria, while disseminated intravascular coagulation was only in 2% of the patients. In this series according to the haematological abnormalities, in the vivax infected patients abnormal Hb (g/dl) was found (24.2%) of the cases, while abnormal Haematocrit (%), TLC ($\times 10^9$/L), Neutrophils (%), Lymphocyte (%), Monocyte (%) and Platelets ($\times 10^9$/L) were found with the percentage of 27 (20.4%), 20 (15.1%), 23 (17.4%), 23 (17.4%), 05 (3.7%) and 42 (31.8%). Malik MA et al,[12] reported in his study, about 74% of the patients had haemoglobin levels of 12.0 g/dl or less and about 13.44% of the patients had haemoglobin levels of less than 6.0 g/dl. The existing literature of malaria shows anaemia rates as low as 4% and as high as 25% respectively.[21] A mild to moderate leucopenia characterized by decreased neutrophils, left shift and moncytosis has been reported for malaria.[22] Leucocytosis may suggest co-existing viral infection particularly in the occurrence of atypical lymphocytes mostly in children with concurrent infections of viras.[23] Many recent studies also show leucocytosis among the malaria patients. Adedapo et al,[24] reported leucocytosis in about 9.5% of the patients with malaria.

Malik MA et al,[4] reported that about 77% of P. falciparum and about 62% of P. vivax patients had thrombocytopenia. Earlier studies confirm the incidence of thrombocytopenia to be higher in P. falciparum malaria. In the study by Nadeem, et al,[25] thrombocytopenia was observed in 83% of P. falciparum patients and in 70% of P. vivax patients. As well as in the present series, Falciparum infected patients abnormal Hb (g/dl) was found in 27 (20.4%) of the cases, while abnormal Haematocrit (%), TLC ($\times 10^9$/L), Neutrophils (%), Lymphocyte (%), Monocyte (%) and Platelets ($\times 10^9$/L) were found with the percentage of 20 (15.1%), 23 (17.4%), 15 (22.0%), 13 (19.1%), 02 (2.9%) and 31 (45.5%) respectively.

Conclusion

In the conclusion of this study, great haematological disturbance are evaluated in the malarial infected patients, mostly thrombocytopenia and anima. For that reason it seems necessary that, malaria is not a simple illness, but also having the great presentation of haematological abnormalities which should be also sought after actively. Therefore physicians and general practitioner should investigate very early haematological reports in the malarial affected patients, to prevention of the patients from severe anaemia and thrombocytopenia.

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