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FREQUENCY OF LOW PLATELET COUNT IN PATIENTS WITH MALARIA IN KARACHI

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ABSTRACT

Objective: The frequency of low platelet counts in malarial patients in a cosmopolitan city **Study design:** Cross sectional **Place & Duration of study:** This study was conducted at the National Medical Centre which is a private medical setup in Karachi, Pakistan from June 2015 to December 2015. **Methodology:** During the study period a total of 186 people who were primarily diagnosed with malaria were included in this study after obtaining the verbal consent. All the study variables were recorded on a predesigned proforma. Initially the platelet count was done through automated analyzer and only the selected patients with reduced platelet count were again evaluated through manually. **Results:** Out of 93 patients, 58 (62.4%) were males and 35 (37.6%) were female. Male and Female ratio was 1.44:1. Mean and standard deviation of age of patients is 34.16+ 13.32 years. Mean and standard deviation of duration of disease is 3.09 + 1.09 days. Mean and standard deviation of BMI of patients is 22.96+ 3.53. **Conclusion:** Malaria is a common issue in cosmopolitan city Karachi, most of patients presenting with malaria have low platelet count. It is imperative for healthcare professionals to well aware of management and identification of various types of malarial infections without losing time.

Key Words: Malaria, Plasmodium Falciparium, Plasmodium vivax, low platelet count.

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INTRODUCTION

Malaria is an acute and chronic illness characterized by paroxysms of fever, chills, sweating, fatigue, anemia, and splenomegaly[1]. Malaria is one of the most prevalent human infection worldwide resulting in 300 to 500 million cases each year.[2] Over 40% of world population lives in malaria endemic area including southeast Asia, India, Pakistan, Bangladesh, Africa, areas of middle east, Central and South America.[3] Pakistan being a part of endemic belt has an incidence of one case per thousand population.[4] P.vivax and

P.falciparum both are common in Pakistan.[5] Rural Sindh and Balochistan are the areas having major disease burden in Pakistan and severe malaria is a well known cause of morbidity and mortality in these regions.[6]

Malaria remain major public health problem in Pakistan.[7] The geographical location coupled with extensive irrigation has considerably added to the malariogenic potential of the area.[8] Today in spite of gigantic development in research, we are still unable to eradicate malaria, or reduce it to a level compatible with socio-economic development, on the contrary deaths from malaria have increased.[9] Government should take adequate steps to combat this disease.

Malaria is caused by Plasmodium transmitted to humans by female Anopheles mosquito, it also transmitted through blood transfusion, by use of contaminated needles, and from a pregnant woman to her fetus.[10] There are four species of the plasmodium i.e. P.falciparum, P.vivax, P.ovale and P.malariae. P.falciparum is the most severe form and commonly associated with serious complications.[11] P.vivax is less severe but some times severe malaria has been noted.[12] clinically malaria mimics many diseases and there are no absolute diagnostic clinical features. Hematological abnormalities have been observed in patients with malaria, anemia and thrombocytopenia being the most common. Thrombocytopenia occurs in 60-80% and anemia in 25%.[13]

The causes of thrombocytopenia in malaria are poorly understood. Certainly, increased platelet destruction is significant during malaria infection. The platelet lifespan is reduced during malaria, [14] which seems to be due to diffuse sequestration of platelets rather than a predominant splenic or hepatic clearance.[15] Thrombocytopenia is often associated with splenomegaly and circulating immune complexes.[16]

Considering the hematological proof, thrombocytopenia in acute febrile illness is an important diagnostic clue for malaria in endemic areas, when associated with anemia.[17] The rationale of our study is to see the magnitude of this problem in our area as the data is not available to guide us. There is gross variation in frequency of thrombocytopenia given by different authors at different locations.[18] The patients with acute febrile illness without localizing signs and having thrombocytopenia physicians think for viral causes not for malaria which is very common in our setup. In this study we have alert the policy makers to use the information and make strategy to do malarial parasite test of all patients with acute febrile illness and thrombocytopenia. The early treatment would minimize the complications.

METHODOLOGY

It was cross sectional study conducted over period of 6 months from June 2015 to December 2015 at National Medical Centre which is a private medical setup in Karachi city. It included all patients over the age of 12 years from both genders who were admitted with history of fever less than 7 days. The malaria is confirmed on the presence of malarial parasite seen on thick and thin blood film stained with leishmans stain. Those patients with history of fever but negative malaria parasite on peripheral blood film in 03 consecutive samples, with clinical features and laboratory findings suggesting chronic liver disease, leukemia, enteric fever, dengue fever, those with history of bleeding disorder, known cases of idiopathic thrombocytopenic purpura and with history of intake of sulphonamide containing drugs, diuretic and chemotherapeutic agents were excluded from the study.

The 3ml of venous blood sampling was collected into EDTA (Ethylene Diamine Triacetic Acid) containing tube and processed immediately for a platelets count on hematological analyzer (BC 3000 plus mindray autohematology analyzer). Those with reduced platelet count < 150000.cmm were reevaluated by manual method. A separate proforma was filled for each patient by researcher himself.

The Statistical data was analyzed on statistical package for social sciences (SPSS) version 10. Descriptive statics were applied to calculate the frequencies and percentage of categorical variables such as gender, parasite species and outcome whether presence or absence of thrombocytopenia. Mean + standard deviation (SD) was calculated for continuous variables like age and duration of disease. Stratification was done to effect on outcome for age sex, parasite species and BMI.

RESULTS

Out of 93 patients, 58 (62.4%) were males and 35 (37.6%) were female. Male and Female ratio was 1.44:1. Mean and standard deviation of age of patients is 34.16+ 13.32 years. Mean and standard deviation of duration of disease is 3.09 + 1.09 days as shown in fig: I. Mean and standard deviation of BMI of patients is 22.96+ 3.53. Frequency of BMI in patients was, 19.4% were under weight, 24.7% were normal, 33.3% over weight, 22.6% had obesity. Thrombocytopenia was detected in 52 (55.9%) patients,

FIGURE NO: I
DURATION OF FEVER IN DAYS
(n=93)

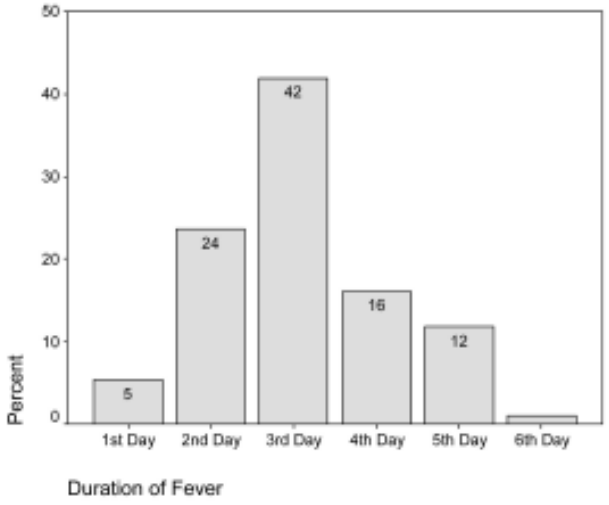


FIGURE NO: II
PERCENTAGE OF PATIENTS WITH SEVERITY OF THROMBOCYTOPENIA

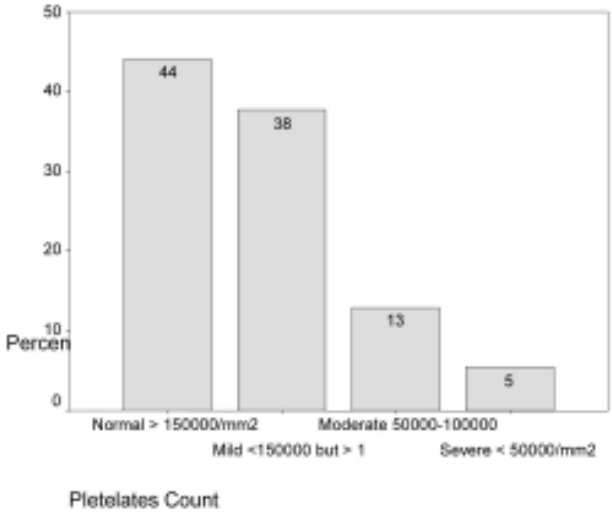


TABLE NO: I

Sex * Plasmodium Crosstabulation

Count

		Plasmodium		
		FALICIPARUM	VIVAX	Total
Sex	Male	42	16	58
	Female	25	10	35
Total		67	26	93

TABLE NO: II

Plasmodium * Thrombocytopenia Crosstabulation

			Thrombocytopenia		
			YES	NO	Total
Plasmodium	FALICIPARUM	Count	34	33	67
		% within Plasmodium	50.7%	49.3%	100.0%
	VIVAX	Count	18	8	26
		% within Plasmodium	69.2%	30.8%	100.0%
Total		Count	52	41	93
		% within Plasmodium	55.9%	44.1%	100.0%

among 52 patients with thrombocytopenia 30 were male 22 were female. The severity of thrombocytopenia in these patients was 35(37.6%) patients had mild, 12(12.9%) had moderate and 5(5.4%) had severe thrombocytopenia as shown in figure II. BMI in thrombocytopenic patients was, 11(21.2%) under weight, 13 (25%) normal, 17 (32.7) over weight and 11(21.2%) had obesity. Sixty seven 67 patients (72%) had P.falciparum infection and 26 (28%) had P.vivax infection. Thirty four (50.7%) patients with thrombocytopenia had Plasmodium falciparum and eighteen (69.2%) had Plasmodium vivax infection as shown table I and table II.

DISCUSSION

This study was conducted in a private medical setup in

Karachi over a period of 6 months (June 2015 to December 2015), where 93 malaria parasite positive patients were taken, and frequency of P.falciparum was 72% as compared to P.vivax 28%. These results were comparable to study conducted at Civil Hospital Karachi by Memon AR et al19, who observed high frequency of falciparum as compared to vivax (85% vs 15%). WHO and local surveillance also reported high P.falciparum ratio in Sindh province.

In this study males were predominant 62.4% and 37.6% were female, with male and female ratio of 1.44:1, which compared with study conducted by Memon AR et al19, 76% were males and 24% females.

Mean and standard deviation of BMI (Body Mass Index) of these patients was 22.96+ 3.53. Frequency of BMI in patients was, 19.4% under weight, 24.7% normal, 33.3% over weight and 22.6% obese.

In this study 52 (55.9%) out of 93 patients were thrombocytopenic, and severity of thrombocytopenia in these patients was 35(67.3%) patients had mild, 12(23.07%) had moderate and 5 (9.61%) had severe thrombocytopenia, resembles with Rodriguez et al17 (58.97%). Memon AR et al19 who reported thrombocytopenia in 70% which is higher than this study, out of them mild thrombocytopenia was 70%, moderate was 22% and severe thrombocytopenia was 8% which is near to this study. P.falciparum was found in sixty seven 67 patients, out of them thirty four (50.7%) had thrombocytopenia and P.vivax was found in 26, out of them 18 (69.2%) had thrombocytopenia. The study by Abro A H showed thrombocytopenia was more common in P.falciparum (87%) than P.vivax (81%),20 which is not consistent with our study as thrombocytopenia was more common in P.vivax. The study done by Qurban showed the frequency of thrombocytopenia was 71.87% in P.falciparum while 93.33% in P.vivax infection21, which is consistent with our study as thrombocytopenia, is more common in vivax infection in this study.

Thrombocytopenia is seen in patients with acute febrile illness due to viral infections but its presence is considered an important diagnostic clue for malaria in endemic areas as suggested by previous investigators22.

Thrombocytopenia is good indicator for malaria; therefore always keep malaria in differential diagnosis for workup in patients with thrombocytopenia.

Gerardin P et al.23 reported that severity of thrombocytopenia correlates with severity of malaria, in his study it was also noted that severe thrombocytopenia had high mortality rate.

On the behalf of this indicator, we can make a high index of suspicion for malaria infection to start its workup, especially in patients those are visiting basic health units, outpatients and emergency departments etc. It would be helpful in early diagnosis and treatment of malaria that in turn, would reduce the morbidity and mortality associated with malaria and its complications.

CONCLUSION

High percentage of thrombocytopenia noted in this study is also suggestive indicator for malaria. Patients from endemic areas with thrombocytopenia, malaria should be included in differential diagnosis because thrombocytopenia is common complication of malaria. Every physician should be very well known about common, rare and atypical presentations of malarial infection can present, so that it can be diagnosed and treated early.

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Authors contribution:
* Concept and design with collection of data ** Review the manuscript
*** Statistical Expertise

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