



ORIGINAL ARTICLE

Thrombocytopenia among patients with vivax-positive malaria.

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ABSTRACT... Objective: To estimate the frequency of thrombocytopenia among patients with vivax-positive malaria. **Study Design:** Cross Sectional Study. **Setting:** Department of General Medicine Hayatabad Medical Complex Peshawar. **Period:** May 2022 to November 2022. **Material & Methods:** Total 140 cohort were observed in this study. Patients were taken as sample according to inclusion and exclusion criteria as per operational definition after the patients' written informed consent. Sociodemographic data was collected on a predesigned questionnaire. History such as febrile illnesses and blood dyscrasias and basic studies and peripheral blood smears were obtained. **Results:** The results of the study showed the sample has mean age 36 years with SD \pm 3.72, of which 70% were men while 30% were women. Thrombocytopenia was observed in 68% of patients. **Conclusion:** In conclusion, the estimated frequency of thrombocytopenia in vivax malaria was found to be 68%.

Key words: Malaria, Thrombocytopenia, Vivax.

INTRODUCTION

Malaria is a vector-borne protozoan disease caused by the Plasmodium parasite and transmitted to humans by the female anopheline mosquito vector. Some 120 species of Plasmodium that can infect mammals, birds, and reptiles. Of these species, six species most frequently infect humans. Among these six species falciparum and P. knowlesian can be fatal with a severe mortality rate, particularly among African children. However, Plasmodium vivax causes relatively mild symptoms. Relatively less is known about Plasmodium ovale curtisi and Plasmodium ovale wallikeri, however the disease usually has a similar course and severity to vivax malaria.

Globally, 243 million cases of malaria are reported. Most of this population lives in the African Region with 85%, while lowest in Eastern Mediterranean Countries (4%). The number of deaths stands at 863,000, of which higher in African 89% and Lower South-East Asia Countries (5%).¹ South

Asian epidemiology shows 1.52 million cases in India, among which higher causative was P. falciparum.²

Species P. falciparum causes most complications in humans. Among these complications, cerebral malaria is the most fatal, with P. falciparum in the blood samples. The prevalence of fatality due to cerebral malaria is higher in adults 20% as compared to childrens.³

Among the most common complications of Malaria, thrombocytopenia is one of them which is more common and severe as per recent studies.⁴ In previous literature very little data is available on pathogenesis of thrombocytopenia in malaria, two different studies have shown that phagocytosis of platelets in malaria causes thrombocytopenia in patients^{5,6}; however, a comprehensive exploration of this phenomenon has not been carried out. In this current study, we calculated the frequency of thrombocytopenia and assessed platelet phagocytosis.

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OBJECTIVE

To estimate the frequency of thrombocytopenia among patients with vivax-positive malaria.

MATERIAL & METHODS

This Cross Sectional was conducted at Department of General Medicine, Hayatabad Medical Complex, Peshawar for 6 months from 05/17/2022 to 11/17/2022.

The total sample size was 140, maintaining the proportion of thrombocytopenia in patients with positive vivax malaria 76.92%8 confidences level 95% margin of error 7% using the WHO calculator. The sampling technique was adopted Consecutive non-probabilistic sampling.

Inclusion Criteria

Any patient 18 to 60 years of age with vivax malaria who meets the criteria for the operational definition of malaria. Both genders were included.

Exclusion Criteria

Patients with established blood dyscrasias, whether primary or secondary. Recent drug intake was excluded.

Ethical permission (937/HEC/B@PSC/2022 Dated 31st August 2022) was granted from the "Hospital Ethics Committee", after the research was conducted in the medical ward of HMC, Peshawar. Patients were taken as sample according to inclusion and exclusion criteria as per operational definition. After appropriate consent from the patients/assistants, Sociodemographic data was collected on pre design questionnaire. History such as febrile illnesses and blood dyscrasias and basic studies and peripheral blood smears were obtained.

All data collected through the form were entered and analyzed using SPSS version 17. Data were interpreted in terms of frequencies for qualitative variables such as gender and thrombocytopenia and reported in tables. For quantitative analysis, the mean and frequencies were calculated for quantitative variables such as patient age. Stratification was performed for thrombocytopenia between age and sex to see effect modifiers. The

chi-square test was used for the association of variables where p value <0.05 was significant, subsequent stratification.

RESULTS

The total number of observed cohorts in General Medicine Department of HMC according to the calculated sample size was n=140. The demographic characteristics of the patients were tabulated as follows:

Age wise analysis of cohort showed as 41 (29%) patients in the 18-30 age range, 43 (31%) patients in the 31-40 age range, 29 (21%) patients in the aged 41 to 50 years. years and 27 (19%) patients in the age range of 51-60 years. The average age was 36 ± 3.72 years. (Table-I).

A more detailed analysis of the gender distribution shows that males were 98 (70%), while females were 42 (30%) patients (Table-II).

The frequency of thrombocytopenia was analyzed, since 95 (68%) patients had thrombocytopenia while 45 (32%) patients did not have thrombocytopenia. (Table-III).

Thrombocytopenia was stratified with respect to age and sex and tabulated in Table-IV,V.

Age	Frequency (%)	Means + SD
18-30 years	41 (29%)	36 + 10.85
31-40 years	43 (31%)	
41-50 years	29 (21%)	
51-60 years	27 (19%)	

Table-I. Distribution by age (n=140)

Gender	Frequency (%)
Male	98 (70%)
Female	42 (30%)

Table-II. Distribution by gender (n=140)

Thrombocytopenia	Frequency (%)
Yes	95 (68%)
No	45 (32%)

Table-III. Thrombocytopenia (n=140)

Thrombo-cytopenia	18-30 years	31-40 years	41-50 years	51-60 years	P- Value
Yes	27	30	20	18	0.9805
No	14	13	9	9	

Table-IV. Stratification of thrombocytopenia according to age (n=140)

Thrombocytopenia	Male	Female	P-Value
Yes	67	28	0.8434
No	31	14	

Table-V. Stratification of thrombocytopenia wrt sex (n=140)

DISCUSSION

Malaria is a vector-borne protozoan disease caused by the Plasmodium parasite and transmitted to humans by the female anopheles' mosquito vector. In this study we intended to estimate the frequency of thrombocytopenia among patients with vivax-positive malaria. Among the sample 70% of the patients were men and 30% of the patients were women with 36+10.3.72 years of age. Sixty-eight percent (68%) of the patients had thrombocytopenia while 32% of the patients did not have thrombocytopenia. Such results were also described by Kumar et al in which they observed 230 patients. Of these 130 cases detected with vivax malaria, 76.92% of the cases had thrombocytopenia.⁸

Our results also correlate with another finding by Guerra CA et al⁹ in which the mean age was 41.3±0.2 years. The frequency of thrombocytopenia in vivax malaria was 52%. Similar results were described by David R et al¹⁰ The mean age of the patients was 40±12 years and the frequency of thrombocytopenia in vivax malaria was 48%. Akhtar et al¹¹ that the incidence of thrombocytopenia in vivax malaria was 37%. Exactly the same comparison is compared with two local studies Rehman ZU et al and Kreil A et al.^{12,13}

In this study hematological parameter was taken because generally thrombocytopenia is observed among patients with malaria.¹⁴ In Tieveny LM, two important findings revealed that thrombocytopenia was associated with malaria; secondly, both vivax and falciparum sp. In another study, thrombocytopenia was found in 93.33% of patients with Plasmodium vivax higher than Plasmodium falciparum.¹⁵

Previous research conducted in Pakistan shows similar results to the present study. Memon

and Afsar¹⁶ and Mahmood et al.¹⁷ showed 93% and 75% thrombocytopenia in patients with Plasmodium falciparum malaria respectively. Thrombocytopenia is observed in both groups of patients by Richards and Behrens.

In our study, anemia was another hematological indicator of thrombocytopenia, which was reported in 56.45% of patients. However, it was difficult to decide that it was due to Malaria or other conditions like nutritional deficiency or worm infestation as previous reports of the patients were not recorded.¹⁸

In another study conducted by Akhtar et al¹¹ leukopenia was observed in only 35.4% of patients of thrombocytopenia.

LIMITATIONS

The results of the study were confined to cross sectional design; case control study should be carried out for more brief outcomes.

Study should be also carried out to decide that thrombocytopenia was due to Malaria or other conditions like nutritional deficiency or worm infestation.

CONCLUSION

Our study concludes that the frequency of thrombocytopenia in vivax malaria was 68%, suggesting that thrombocytopenia should be addressed and controlled in patients with VIVAX-positive malaria.






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AUTHORSHIP AND CONTRIBUTION DECLARATION

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2	Muhammad Ali	Introduction, Writing.	
3	Muhammad Bilal Khattak	Discussion, Writing.	
4	Siraj ul Islam	Data analysis.	
5	Afrasyab Khalil	Data review, Table configuration.	
6	Shafiullah Khan	Data collection, Method & Material.	