International Journal of Research and Review
www.ijrrjournal.com E-ISSN: 2349-9788; P-ISSN: 2454-2237

Original Research Article

Thrombocytopenia: Frequency and Degree in Patients with Malaria

SumitGiri[1], Karandeep Singh[2]

[1]Associate Professor, Dept. of Pathology, Saraswathi Institute of Medical Sciences, Hapur, U.P., India,
[2]Professor, Dept. of Pathology, Maharaja Agrasen Medical College, Agroha, Hisar, Haryana, India.

Corresponding Author: SumitGiri

Received: 25/01/2016 *Revised: 30/01/2016* *Accepted: 01/02/2016*

ABSTRACT

Background and Aims: Malaria is an endemic disease in tropics and subtropics which is caused by protozoa of the genus plasmodium. Thrombocytopenia is a common finding in malaria. This study was undertaken to correlate the presence and severity of thrombocytopenia with the type of malaria.
Materials and methods: This was a retrospective study of medical records of 138 patients with confirmed diagnosis of malaria by Quantitative buffy coat (QBC) technique. Patients were divided into three categories based on platelet count. Thrombocytopenia was considered marked if platelet count was <50,000 cells/cu.mm, moderate if 50,000-99,999 cells/cu.mm, and mild if 100,000-149,999 cells/cu.mm.
Results: In the present study malaria positive patients were investigated for platelet count. Out of 138 positive cases 107 (77.54%) patients were males and 31 (22.46%) patients were females. Majority of the patients (81) were between 33- 39 years. Sixty six (47.83%) patients had mixed malaria and 62 (44.92%) were positive for plasmodium vivax. Isolated P. falciparum was detected in only 10 (7.25%).Out of these 66 cases detected with mixed malaria infection, 15 cases (22.73%) had mild, 22 cases (33.33 %) had moderate and 16 cases (24.24%) had severe degree of thrombocytopenia. Out of the 62 patients detected with vivax malaria 21cases (33.87%) had mild, 16 cases (25.81%) had moderate and 6 cases (9.68%) had severe degree of thrombocytopenia. Out of 10 cases (7.25%) of falciparum infection, 3 cases (30%) had mild and 5 cases (50%) had moderate degree of thrombocytopenia.
Conclusion: Although absence of thrombocytopenia is uncommon in malaria, its presence is not a distinguishing feature between the two types. The above findings can have therapeutic implications in context of avoiding unnecessary platelet infusions with the relatively more benign course in P. vivax malaria. We propose that the platelet count can serve as an important initial screening tool in this setting.

Key words: Thrombocytopenia, malaria, plasmodium vivax, plasmodium falciparum.

INTRODUCTION

Malaria is a major cause of illness and death occurring in more than one million cases annually in tropical countries, including India. [1] Worldwide, approximately 2 billion individuals are at risk; 100 million develop overt clinical disease and 1.5-2.7 million die every year. [2] Karnataka has the highest incidence of malaria in south India and in 2003.

Nearly100 thousand cases were reported in this state, with 22 deaths. This study was conducted in Mangalore which is a principal city of South Canara on the shore of Arabian Sea. Malaria is endemic in this city and has already killed more than 300

people in the past 15 years. [3] Malaria parasite affects multiple organs like liver, spleen, brain, gastro intestinal tract, gall bladder, pancreas, blood vessels and placenta. Hence clinicians should be aware of the clinical presentations ranging from simple malaise to life-threatening central nervous system symptoms like coma. Hematological abnormalities have been observed in patients with malaria, anaemia and thrombocytopenia being the most common. [4,5]

Thrombocytopenia has been reported to be associated with malaria, with an incidence ranging from 60%-80%, with some studies reporting a lower incidence in vivax malaria as compared to falciparum malaria.[6] A finding of thrombocytopenia should increase the suspicion of malaria and lead to performance of more specific tests, including multiple peripheral smears and ELISA for parasite-specific antigen. [7]

The present study was carried out to assess thrombocytopenia in patients admitted with malaria and to correlate the degree of thrombocytopenia with malaria type.

MATERIALS AND METHODS

This was a retrospective study of medical records of 138 patients, admitted to Kasturba Medical College Mangalore, with confirmed diagnosis of malaria by QBC (Quantitative buffy coat) technique. A case sheet proforma were prepared which included patients' history, clinical examination details and investigations of the patients. Inclusion criteria: Patients above 20 years who were diagnosed malaria by QBC were included in the study. Exclusion criteria: Those with history or clinical features mimicking malaria (QBC Negative) or suggesting chronic liver disease, bleeding disorders, haematological malignancy and certain chemotherapeutic drugs were excluded. Platelet count was done on a fully automated, quantitative, haematology Coulter analyser. Patients were divided into three categories based on platelet count. Thrombocytopenia was considered marked if platelet count was <50,000 cells/cu.mm, moderate if 50,000-99,999 cells/cu.mm, and mild if 100,000-149,999 cells/cu.mm.

RESULTS

Out of 138 patients, 107 (77.54%) patients were males and 31 (22.46%) patients were females. Majority of the patients (81) were between 33- 39 years [Table 1].

Sixty six (47.83%) patients had mixed malaria and 62 (44.92%) were positive for plasmodium vivax. Isolated P. falciparum was detected in only 10 cases (7.25%) thus showing that P. falciparum was less seen in Dakshina Kannada region.

Table 1: Age and sex distribution in patients with malaria

Age	Males	Females	Total
20-29 Years	25	8	33
30-39 Years	64	17	81
40-49 years	12	4	16
50 years & above	6	2	8
Total	**107**	**31**	**138**

Table 2: Platelet count in patients with malaria

Type of malaria	Marked thrombocytopenia (Platelets < 50,000)	Moderate thrombocytopenia (Platelets 50,000-99,999)	Mild thrombocytopenia (Platelet 100,000-149,999)	Within normal range (150,000 & above)	Total
P.Vivax	6 (9.68%)	16 (25.81%)	21 (33.87%)	19 (30.65%)	62 (44.92%)
Mixed infection	16 (24.24%)	22 (33.33%)	15 (22.73%)	13 (19.79%)	66 (47.83%)
P.Falciparum	00	05 (50%)	03 (30%)	02 (20%)	10 (7.25%)
Total	22 (15.94%)	43 (31.16%)	39 (28.26%)	34 (24.64%)	138 (100%)

Out of the 66 cases detected with mixed malaria infection, 15 cases (22.73%) had mild, 22 cases (33.33%) had moderate and 16 cases (24.24%) had severe degree of thrombocytopenia. Out of the 62 patients detected with vivax malaria 21cases (33.87%) had mild, 16 cases (25.81%) had moderate and 6 cases (9.68%) had severe degree of thrombocytopenia, thus showing that P. vivax can also result in low platelet count. Out of 10 cases (7.25%) of falciparum infection, 3 cases (30%) had

mild and 5 cases (50%) had moderate degree of thrombocytopenia [Table 2].

DISCUSSION

Thrombocytopenia often accompanies malaria and is usually mild to moderate and very rarely symptomatic. Haematological abnormalities are common. Thrombocytopenia occurs in 60-80%. [8] Absence of thrombocytopenia is uncommon in the laboratory diagnosis of malaria. Presence of thrombocytopenia is not a distinguishing feature between the two types of malaria. The mechanism of thrombocytopenia in malaria is not clearly known. Fajardo and Tallent in 1974 demonstrated *P. vivax* within platelets by electron microscopy and suggested a direct lytic effect of the parasite on the platelets. [9] Both non-immunological destruction as well as immune mechanisms involving specific platelet-associated IgG antibodies that bind directly to the malarial antigen in the platelets has been recently reported to play a role in the lysis of platelets and the development of thrombocytopenia. In clinical trials, recombinant – macro-phage colony stimulating factor (M-CSF) has been known to cause a reversible dose dependent thrombocytopenia. Elevated M-CSF levels in malaria, by increasing macrophage activity may mediate platelet destruction in such cases. [10] Oxidative stress damage of thrombocytes has also been implicated in the etiopathogenesis based on the finding of low levels of platelet superoxide-dismutase and glutathione peroxidase activity and high platelet lipid peroxidation levels in malaria patients, when compared to those of healthy subjects. [11]

CONCLUSION

Although absence of thrombocytopenia is uncommon in malaria, its presence is not a distinguishing feature between the two types. The above findings can have therapeutic implications in context of avoiding unnecessary platelet infusions with the relatively more benign course in P. vivax malaria. We propose that the platelet count can serve as an important initial screening tool in this setting.

REFERENCES

1. World Health Organization. WHO guidelines for the treatment of malaria. Geneva: WHO, 2006: 1-253.
2. Greenwood BM, Bradley AH. Mortality and morbidity from malaria among children in a rural area of Gambia West Africa. *Trans Roy Soc Trop Med Hyg* 1987; 81: 478-86.
3. Malaria in mangaluru. [Online] Available from: http://www. malariasite. com/malaria MalariaInMangalore.htm Malaria site.
4. http://www.brown.edu/Research/EnvStudies
5. Khan SJ, Khan FR, Usman M, Zahid S. Malaria can lead to Thrombocytopenia. Rawal Med J 2008; 33: 183-185
6. Bhandary N, Vikram GS, Shetty H. Thrombocytopenia in malaria: A clinical study. Biomed Res 2011; 22(4): 489-491.
7. Patel U, Gandhi G, Friedman S, Niranjan S. Thrombocytopenia in Malaria. Journal of the national medical association 2004; 96 (9): 1212-1214.
8. Ansari S,Khoharo HK, Abro A, Akhund IA,Qureshi F. Thrombocytopenia in plasmodium falciparam malaria. J Ayub Med Coll Abbottabad 2009;21(2): 145-147.
9. Fajardo L.F, Tallent C. Malarial parasites within human platelets. JAMA 1974; 229: 1205-1209.
10. Lee S.H, Looaresuwan S, Chan J, et al. Plasma macro-phage colony stimulating factor and P-selection levels in malaria associated thrombocytopenia. Thromb Haemost 1997; 77 (2): 289-293.
11. Makkar, RPS, Mukhopadhyay S, Monga A, Gupta AK. Plasmodium Vivax Malaria Presenting With Severe Thrombocytopenia. The Brazilian Journal of Infectious Diseases 2002; 6 (5):263-265.

How to cite this article: Giri S, Singh K. Thrombocytopenia: frequency and degree in patients with malaria. Int J Res Rev. 2016; 3(2):8-10.

****