IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 18, Issue 7 Ser. 7 (July. 2019), PP 10-14
www.iosrjournals.org

Prospective Study of Thrombocytopenia in Patients of Malaria in a Teritiary Care Hospital.

Dr .K.Mohan Rao[1] ,Dr.R.Kishore kumar[2] ,Dr.S.Padma sravani[3] ,Dr .R.V.S.N .Ramachandrudu[4],Dr. R.Ashalatha[5],Dr.J.Srujani [6]

[1]*Associate professor ,Department of General medicine ,GGH, Anantapuramu,*
[2]*Assistant professor , Department of General medicine ,GGH, Anantapuramu,*
[3]*Assistant professor , Department of Pharmacology ,GMC, Anantapuramu ,*
[4]*Associate professor ,Department of Pharmacology ,GMC, Anantapuramu,*
[5]*Associate professor ,Department of Pharmacology ,GMC, Anantapuramu ,*
[6]*Postgraduate in Department of Pharmacology ,GMC, Anantapuramu.*
Corresponding Author :S. Padma sravani

Abstract: *Malaria is a protozoal disease caused by infection with parasites of the genus Plasmodium to man by certain species of infected female Anopheline mosquito. In 2017 , there were 9.5 million cases in India. Haematological abnormalities have been observed in patients with malaria, anaemia and thrombocytopenia being the most common.we conducted study to find out the frequency and degree of thrombocytopenia in patients with malaria in tertiary care hospital.In our study ,210 patients with malaria positive were investigated for platelet count.RESULTS: In our study 115 patients , 65 (56.51%) were positive for plasmodium vivax, 45(39.13%) were positive for plasmodium falciparum and 5(4.5%) had mixed infection with both P.falciparum and p.vivax.out of 65 cases detected with vivax malaria, 48 cases had thrombocytopenia.Out of 45cases detected with falciparum malaria ,35 cases had thrombocytopenia. Among 5 cases of mixed infection ,4 cases had thrombocytopenia.CONCLUSIONS :Presence of thrombocytopenia in a patient with acute febrile illness in the tropics increases the possibility of malaria .The above finding can have therapeutic implications in context of avoiding unnecessary platelet transfusion in malaria patients.*

Key words*: Malaria ,plasmodium falciparum ,plasmodium vivax,thrombocytopenia*

Date of Submission: 06-07-2019 Date of acceptance: 20-07-2019

I. Introduction

Malaria is a protozoal disease caused by infection with parasites of the genus plasmodium and transmitted to man by certain species of infected female Anopheline mosquito.Five species of plasmodium (plasmodium vivax,plasmodium falciparum,plasmodium malariae,plasmodium ovale and plasmodium knowlesi) cause malaria in humans.

In India about 27% of population lives in malaria high transmission area and 58%in low transmission area(1).In 2008 there were

1.52 million cases of malaria in India ,out of which 0.76 million case of p.falciparum ,compromising 50%of total malaria cases.There were 924 deaths from malaria(2) A typical attack of malaria comprises three distinct stages : cold stage ,hot stage and sweatind stage.the clinical features of malaria vary from mild to severe and complicated ,according to the species of parasite present ,the patient ‘s state of immunity ,the intensity of infection and also presence of concomitant conditions such as malnutrition and other diseases.Malaria parasite affects multiple organs in the body such as liver,spleen,brain gastro intestinal tract,gall bladder,pancrease,blood vessels and placenta.hence clinical picture could be of wide spectrum ranging from simple malasia to life threatening central nervous symptoms like coma.haematological abnormalities have been observed in patients with malaria ,anaemia and thrombocytopenia being the most common.(3,4).A number of observational studies have confirmed the association of thrombocytopenia to malaria.Both immunological and non-immunological destruction of platlets have been implicated in causing thrombocytopenia.the speculated mechanisms are coagulation disturbances ,sequestration in spleen ,antibody mediated platlet

destruction ,oxidative stress and role of platlets as cofactors in triggering severe malaria.Abnormlities in platlet structure and fuction have been described as a consequence of malaria and in rare instances platlets can be invaded by malaria parasites.(5,6,7).we conducted this study to find out the frequency and the degree of thrombocytopenia in patients with malaria in tertiary care hospital.

II. Material And Methods

The blood were carried out in government general hospital ,Anantapuramu,Andhra Pradesh. This prospective study was carried out from 2 /1/2016 to 11 /12 /2017.A total of 210 patients were included in our study ,that were found the positive for malaria parasite.Malaria test was carried out by thin and thick smear examination .Thin smear was stained by leishmein stain and thick smear was stained by field stain .in field stain polychromated methylene blue and eosin stains specifically to basophilic and acidophilic cellular elements to demonstrate blood cells and hemoparasites.all patients undergone for complete blood count by "ABX pentra Df120" a fully automated hematology analyser by horiba.data analysed by excel sheet .Grading of thrombocytopenia was carried out according to NCI Common Terminology Criteria for Adverse events Version 3.0 .(8)

According to the patients with thrombocytopenia have been divided in to following five grades: Grade 0 : With in mormal limit ,platlet count 1,50,000 or above
Grade 1;Platelet count between 1,50,000 and 75,000 Grade 2: Platelet count between 75,000 and 50,000
Grade 3: Platelet count between 50,000 and 25,000 Grade 4 : Platelet count less than 25,000

III. Results

In our study ,115 patients with malaria positive were investigated for platelet count .out of 115 patients ,68 (65.22%)were males and 37(34.7%)were females.Age of patients was between 1 year and 60 years with majority of patients between 15 years and 40 years of age (comprising about 56%)[Table 1]

A total of 21(27.3%)patients were belonging to paediatric age group [table 1].Mean haemoglobin value was 12.0+ 2.1 g% (ranging from 6.1 g% to 15.2 g%) and mean white blood cell count was 12,000 + 13,00/cu mm(ranging from 2,800 to 19,400/cu mm).Mean platelet count was 151,000+50,000/cu mm(ranging from 11,000 to 313,000/cu mm).All the patients had fever (100%)at the time of presentation ,followed by weakness (95%), nausea (90%),vomiting (86%),anorexia (80%) and diarrhea (5%).Most common sign was anaemia (80%) followed by splenomegaly (20%), jaundice and mortality was not seen [Table 2]

Table 1:

Age(in years)	Male(%)	Female (%)	Total(%)
1-14	20(17.39)	12 (10)	32 (27.3)
15-25	25(21.73)	14 (11.73)	39 (33.4)
26-40	15(13.04)	10 (9.13)	25(22.17)
41-60	15(13.04)	04(3.91)	19(16.95)
Total	75(65.5%)	40(34.5%)	115 (100)

Frequency of clinical features in malaria:

Symptoms/signs	Clinical features	Number of patients	Percentage
Symptoms	Fever	115	100
,	Weakness	109	95
	Nausea	103	90
	Anorexia	92	80
	Diarrhea	6	5
Signs	Anaemia	92	80
	Splenomegaly	23	20
	Jaundice	11	10
	Hepatomegaly	3	

Table 2:

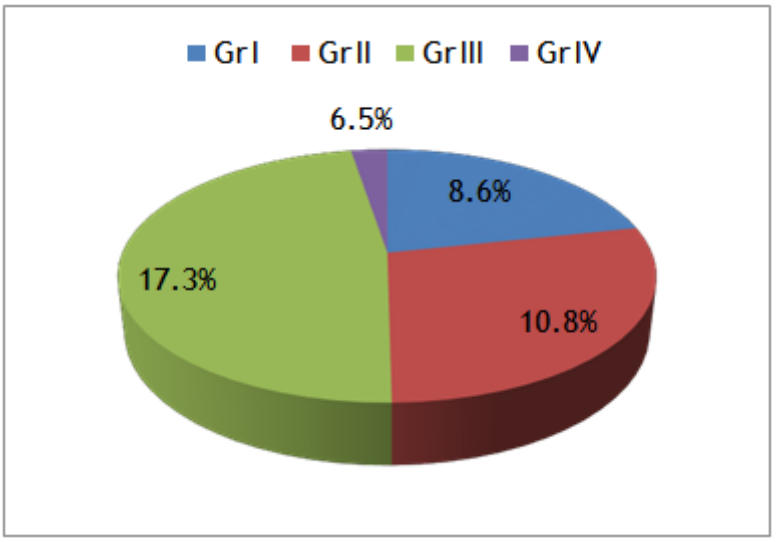

Fig 1. Thrombocytopenia grading in P.vivax malaria. Grade I represents 10 (8.6%)cases,Grade II represents 12(10.8%)cases,Grade III represents 19 (17.3%) cases ,Grade IV represents 9 (6.5%) cases.

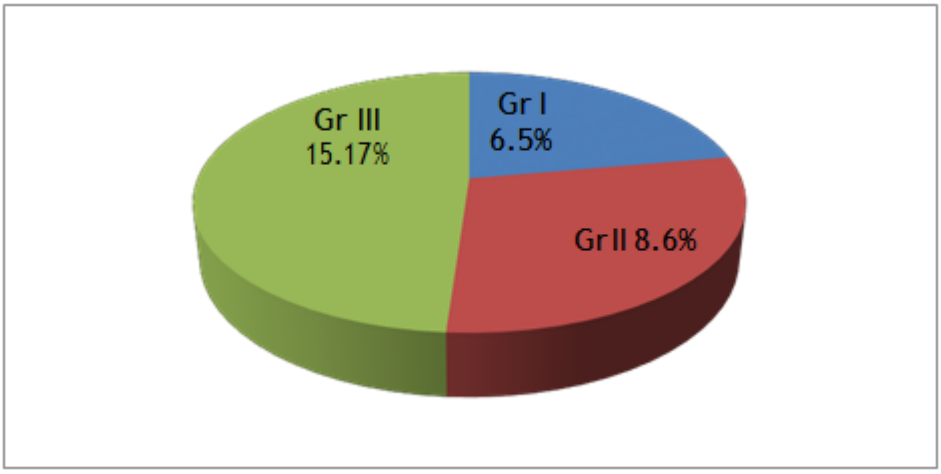

Fig 2 : Pie diagram represents the thrombocytopenia in P. falciparum malaria .Grade I represents the 10 (6.5%) cases ,Grade II represents 13 (8.6%)cases ,Grade III represents 22(15.17%) cases . No cases detected in Grade IV .

In the study group of 115 patients:65(56.5%)were positive for plasmodium vivax ,45 were positive for plasmodium falciparum and 5 had mixed infection with both plasmodium vivax and falciparum. Out of 65 cases detected with vivax malaria, 48 cases had thrombocytopenia, 17 cases had normal platelet count .10 cases had grade I thrombocytopenia . 12 cases had grade II thrombocytopenia ,19 cases had grade III thrombocytopenia and 9 cases had grade IV thrombocytopenia.

Out of 45 cases detected with falciparum malaria, 35 cases had thrombocytopenia, 10 cases had normal platelet count .10 cases had grade I thrombocytopenia . 13 cases had grade II thrombocytopenia ,22 cases had grade III thrombocytopenia and no cases had grade IV thrombocytopenia. Among 5cases of mixed infection ,4 cases had thrombocytopenia , 1 cases had normal platelet count. 3(1.3%) cases had grade I thrombocytopenia . No cases had grade II thrombocytopenia , 1(0.43%) cases had grade III thrombocytopenia and No cases had grade IV thrombocytopenia.

IV. Discussion

Malaria caused by P.vivax and P.falciparum is endemic in many parts of india . Malaria affects almost all blood components and is a true hematalogical disease.Thrombocytopenia and anaemia are the most frequently assosciagted haematological complications .In endemic areas malaria has been reported as the major cases of low platelet counts.this is so characteristic of malaria, that in some places it is used as an indicator of malaria in patients presenting with fever.Platelet count of less than 1,50,000 /cumm increases the likelihood of malaria 12-15 times.(9,10,11)

P. vax was the common spices in our study, though many of the patients included in our study had infection with P.falciparum (30%) and mixed infection (45%).Facela et.al .(6) in her study found similar results .in our study thrombocytopenia was seen in 78 % cases . Colonel et al. (12) reported thrombocytopenia in 72 % of the patients with malarial infection .Jamal etal(14) in there study on paediatric patients have reported low platelet count in 72 % of patients with malaria infection .however few studies reported slightly lower incidence of thrombocytopenia like 40 % (9) and 58.9%(14).

Exact mechanism of thrombocytopenia in malaria is unknown.Fajardo and Tallent demonstrated P.vivax with in platelets and suggested a direct lytic effect of the parasite on the platelets(15). Both non – immunlogical destruction as well as immune mechanism involving specific platelet associated IgG antibodies that bind directly to malaria antigen in the platelet have been recently reported to play a role in the lysis of the platelets.(16).Oxidative stress damage of the platelets has also been implicated in the etiopathogenesis based on the finding of low level of platelet superoxide dismutase and gluththione peroxidise activity and high platelet lipid peroxidation levels in the malaria patients .when compared to those of healthy subjects [17].Decreased thrombocytopoiesis has been ruled out,because platlet forming megakaryocytes in the marrow are usually normal or increased [9,17,18,19].A good tolerance of low platelet count is well known in malaria.This could be explained by platelet activation and an enhanced agreeability.[11] The hyperactive platlets may enhance hemostatic responses and that is why bleeding episodes are very rare in acute malarial infections,despite significant thrombocytopenia [20].

In our study, we found more signinificant thrombocytopenia in p.vivax malaria.More cases of thrombocytopenia in vivax malaria infection may attribute to possible development of a new genotype of p.vivax[17].Recent studies have shown that thrombocytopenia is equally or even more common in p.vivax malaria contrary to the popular belief that it may be observed in p.falciparum malaria
.[21,22,23,24,25]. More recent studies conducted from the Indian subcontinent have found significant thrombocytopenia in p.vivax malaria [29,30] Studies from Qatar and Venezuela had shown similar results [31,32].
There is no matched control group.This is one of the limitation of the study.

V. Conclusion

Higher frequency of mild to severe thrombocytopenia ws observed in patients suffering from malaria.The above findings can have therapeutic implications in context of avoiding unnecessary platlet infusion in malaria patients.presence of thrombocytopenia in a patient with acute febrile illness in tropics increases the possibility of malaria .This may be used in addition to the clinical and microscopic parameters to the heighten the suspicion of this disease and prompt initiation of the treatment.

References

[1]. Geneva Switzerland :WHO Pree;2009 .WHO. World Malaria Report [Google scholor] New delhi:DGHS ,Ministry of Health and Family welfare ;2009 .Government of India .Strategic Action Plan for Malaria Control in India 2007 -2012 .[Google scholor]
[2]. Wickramasinghe SN ,Abdalla SH.Blood and marrow changes in malaria ,Baillieres Best pract Res Clin Haematol.2000;13:277 - 99.[pubmed][Google scholor]
[3]. Khan SJ,Khan FR,Usman M,Zahid S,Malaria can lead to thrombocytopenia .Rawal Med J.2008;33:183-5.[Google scholor]
[4]. Jadhav UM,Patkar VS ,Kadan NN.Thrombocytopenia in malaria :Correlation with type and severity of malaria .J Assoc Physicians India .2004;52:615 -8.[pubmed][google scholor]
[5]. Faseela TS ,Roche,Anita KB,Malli CS,Rai Y.Diagnostic value of platelet count in malaria .J Clin Diagn Res.2011;5:464- 6.[Google scholor]
[6]. Rasheed A,Saeed S,Khan SA.Platelet counts in malaria.Pak J Phytopathopathol.2008;19:86-8.[Google Scholar]
[7]. Bethesda :U.S Department of Health and Human Services ;2006 .National Cancer Institute Criteria for Adverse Events Version 3;p.4.[Google scholor]
[8]. Maina RN ,Walsh D,Gaddy C,Hongo G,Waitumbi J,Otieno L et al .Impact of plasmodium falciparum infection on haematological parameters in children living in Western Kenya .Malar J.2010;9 (suppl 3):S4.[PMC free article][pub Med][Google Scholor]
[9]. Adedapo AD, Falade CO ,Kotila RT,Ademowo GO.Age as a risk factor for thrombocytopenia and anaemia in children treated for acute uncomplicated falciparum malaria .J Vector Borne Dis .2007 ;44:266-71.[pub Med][Google scholor]
[10]. Lathia TB ,Joshi R.Can haematological parameters discriminate malaria from non malaria acute febrile illness in tropics?Indian J Med Sci .2004 ;58:239-44[pubMed][Google scholor]
[11]. Colonel KM ,Bhika RD ,Khalid S,Khalique –ur –Rehman S,Syes ZA.Severe thrombocytopenia and prolonged bleeding in patients with malaria (a clinical study of 162 malaria cases) World applied Sci J.2010 ;9:484-8.[Google Scholor]
[12]. Jamal A,Memon IA ,Latif F .The association of plasmodium vivax malaria with thrombocytopenia in febrile children .Pak Paediatr J.2007 ;31:85-9[Google scholor]
[13]. Rodriguez Morales AJ ,sanchez E,Vargas M ,Piccolo C,Colina R,Arria M,Anemia and thrombocytopenia in children with plasmodium vivax malaria .J Trop Pediatr.2006 ;52:49-51[pub Med].
[14]. Fajardo LF ,Tallent C. Malarial parasites with in human platelets .J Am Med Assoc.1974;229:1205-9
[15]. Makkar RP,Mukhopadhyay S,Monga A,Gupta AK.plasmodium vivax malaria presenting with severe thrombocytopeniaBraz J Infect Dis .2002;263-5.
[16]. Meanat M,Sharifi-Mood B.Malaria vivax and severe thrombocytopenia in Iran.Iran J Parasitol.2010;5:69-70.
[17]. Gursharan SN,Neha S.Thrombocytopenia and other complications of plasmodium vivax malaria .Curr Pediatr Res.2011;15:117 -9.

[18]. Leowattana W ,Tangpukdee N ,Thar SK ,Nakasiri S,Srivilairit S ,Kano S et al.Changes in platelet count in uncomplicated and severe falciparum malaria .Southeast Asian J Trop Med Public Health .2010;41 :1035-41.
[19]. Bashwari LA, Mandil AM,Bahnassy AA,Al-Shamsi MA,Bukhari HA .Epidemiological profile of malaria in a university hospital in the eastern region of Saudi Arabia.Saudi Med J.2001;22:133-8
[20]. Aggarwal A,Rath S,Shashiraj plasmodium vivax malaria presenting with severe thrombocytopenia .J Trop Paediatr.2005;51:120-1.
[21]. Anstey NM,Currie BJ,Dyer ME.Profound thrombocytopenia due to plasmodium vivax malaria .Aust N ZJ Med.1992;22:169-70.
[22]. Bhatia V,Bhatia J.Severe thrombocytopenia with bleding manifestation in two children secondary to plasmodium vivax.platelets.2010;21:307-9.
[23]. Harish R,Gupta S.plasmodium vivax malaria presentin with severe thrombocytopenia ,cerebral complications and hydrocephalus.Indian J Pediatr. 2009 ;76:551-2
[24]. Kakar A,Bhoi S,Prakash V,Kakar S.Profound thrombocytopenia in plasmodium vivax malaria .Diagn Microbiol Infect Dis.1999;35:243-4.
[25]. Kaur D,Wasir V,Gulati S,Bagga A.Unusual presentation of plasmodium vivax malaria with severe thrombocytopenia and acute renal failure .JTrop Pediatr.2007;53:210-2.
[26]. Kumar A,Shashirekha Thrombocytopenia –An indicator of acute vivax malaria .Indian J Pathol Microbiology.2006;49:5058.
[27]. Kochar DK,Das A,Kochar A,Middha S ,Acharya J,Tanwar GS et al .Thrombocytopenia in plasmodium falciparum ,plasmodium vivax and mixed infection malaria :A study from Bikaner (Northwestren India)platelets .2010;21:623-7
[28]. Srivastava S,Ahmad S, shirazi N ,Kumar Verma S,Puri P .Retrospective analysis of vivax malaria patients presenting to tertiary referral centre of Uttarakand .Acta Trop .2011;117:82-5.
[29]. George P,Alexander LM .A study on the clinical profile of complicated plasmodium vivax mono-infections .Asian Pac J Trop Med.2010;3:560-2
[30]. Khan FY ,Lutof AK ,Yassin MA ,Khattab MA ,Saleh M ,Rezeq HY ,et al .Imported malaria in Qatar : A one year hospital based study in 2005 .Travel Med Infect Dis .2009;7:111-7.
[31]. Gonzalez B,Rodulfo H,De Donato M, Berrizbeitia M,Gomez C,Gonzalez L.Haematological variations in patient with malaria caused by plasmodium vivax before ,during and after treatment .Invest Clin.2009;50:187-201.

S. Padma sravani" Prospective Study of Thrombocytopenia in Patients of Malaria in a Teritiary Care Hospital."IOSR Journal of Dental and Medical Sciences (IOSR-JDMS), vol. 18, no. 7, 2019, pp 10-14.