Case Report

J Vect Borne Dis 43, September 2006, pp. 147–149

Thrombocytopenia *in Plasmodium vivax* infected children

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Key words Thrombocytopenia – vivax malaria

Malaria is endemic in 91 countries. Maximum mortality is associated with *Plasmodium falciparum* malaria and more than 8,00,000 deaths occur in children less than five years of age[1]. *P. falciparum* usually presents with severe or complicated malaria, which presents as fever, chills, shock, hepatic failure, renal failure, cerebral malaria and malarial sepsis. It leads to 100% mortality if left untreated. Simple malaria presents with fever, chills and splenomegaly and is usually caused by *P. vivax, P. malariae* and *P. ovale*. Thrombocytopenia is a usual phenomenon in complicated malaria and is uncommonly seen in *P. vivax*. Thrombocytopenia has been found in 3.6% of adult patients with *P. vivax* from India[2] and only one case of severe malaria has been reported in a child[3]. However, in 2004 during the rainy season, we had six children who presented with fever and thrombocytopenia due to vivax malaria, which was never seen in previous years suggesting a change in the clinical presentation of the disease. We present these six cases with discussion on thromobocytopenia in vivax malaria.

Description of cases: During September to October 2004, five children in the age group of 5 months to 12 years presented with fever for a mean duration of three days. A two month old infant presented with hypothermia and refusal to feeds. None of the children had vomiting, cough, diarrhea, altered sensorium, skin rash or bleeding from any site. On examination, one child had hypotension on presentation and all other children had normal vital parameters. On systemic examination, four patients were found to have splenomegaly, of those two patients also had hepatomegaly. Other systemic examinations were normal. Baseline investigations showed thrombocytopenia on complete blood count. In addition, two of them also had leucopenia. Urine and stool examinations along with chest X-ray were normal. In view of fever with thrombocytopenia, patients were screened for dengue, sepsis, enteric fever and malaria by doing a dengue IgM by Panbio ELISA test, blood culture, Widal test and peripheral smear with OptiMAL test respectively. All children had presence of schizonts of *P. vivax* in peripheral smear with a strongly positive OptiMAL test for *P. vivax*. The child with hypotension on presentation had a positive dengue IgM test.

All patients were treated with oral quinine for seven days. The two month old infant developed intermittent apnea due to continued haemolysis and required blood transfusion for his anaemia. The child with hypotension and positive dengue IgM test developed malena and required vasopressor support and platelet transfusion. Mean time for disappearance of parasite in peripheral smear was 3.8 days with a median time of 3 days. All patients recovered completely. On recovery, platelet count and WBC count returned to normal (Normal platelet count in

children = 1.5–4.5 lakhs/cumm). Details of each case are given in the Table 1.

Discussion: Thrombocytopenia though described with *P. vivax* malaria is not so commonly seen. However, in last rainy season, we had six children with thrombocytopenia and vivax malaria indicating a change in the malarial disease pattern in the Indian subpopulation. Thrombocytopenia seen in complicated falciparum malaria is due to disseminated intravascular coagulation along with platelet endothelial activation, but the one seen in uncomplicated malaria like *P. vivax* has multifactorial etiology. Few postulated mechanisms are macrophage activation leading to platelet destruction[4], increased levels of cytokines[5], immunological destruction due to antiplatelet IgG[6], oxidative stress[7], shortened platelet life span in peripheral blood and sequestration in nonsplenic areas[8] and partly due to psuedothrombocytopenia due to clumping of platelets[9].

Though thrombocytopenia is rare in *P. vivax* malaria, it has been found that sensitivity of platelet count for diagnosing malaria was 100%, and the specificity was 70% and thus presence of thrombocytopenia in a child with fever in an endemic area should make one suspect malaria and tests for the same should be done[10]. Similarly, all our patients predominantly presented with only fever and thrombocytopenia and on presence of thrombocytopenia, we had investigated them for malaria.

The severity of thrombocytopenia is much less in *P. vivax* malaria as compared to *P. falciparum* malaria. In a study from India, it has been found that platelet count < 20,000/cumm was noted in only 1.5% cases of vivax malaria as against 8.5% cases of falciparum malaria, and none of the subjects with vivax malaria had a platelet count less than 5000/cumm[11]. Similar findings have been found in our patients with only one child having a platelet count below 20,000/cumm and that too with a co-infection with dengue. Throm-

Table 1. Clinical characteristics of the six patients on presentation

Patients	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6
Age/Sex	5 yr/M	8 yr/F	5 yr/F	2 months/M	12 yr/M	5 months/F
Fever (in days)	3	3	4	Hypothermia	5	4
Organomegaly	No	Splenomegaly	Hepatosplenomegaly	No	Hepatosplenomegaly	Splenomegaly
Haemoglobin (g/dl) on presentation	11	12.5	10.2	10.9	12.6	7.3
WBC count (cells/cumm)	8600	6600	5000	2900	2800	11000
Platelet count (cells/cumm)	59000	55000	14000	77000	48000	92000
Peripheral smear	*P. vivax*	*P. vivax*	*P. vivax*	*P. vivax*	*P. vivax*	*P. vivax*
Parasitic index	0.8%	0.8%	3%	3.5%	2%	2.4%
OptiMAL	*P. vivax*	*P. vivax*	*P. vivax*	*P. vivax*	*P. vivax*	*P. vivax*
Oral quinine (in days)	7	7	7	7	7	7
Disappearance of parasites (in days)	3	3	5	6	3	3
Ionotrope support	No	No	Yes	No	No	No
Blood/Blood product transfusion	No	No	Platelets	Packed cells	No	No
Dengue IgM (normal < 0.9)	– (ve)	– (ve)	+ (ve) (1.38)	– (ve)	– (ve)	– (ve)

bocytopenia in uncomplicated *P. vivax* malaria is usually asymptomatic and needs no treatment by itself. One can avoid unnecessary platelet infusions with the relatively more benign course in *P. vivax* malaria as we found in our patients, where again only the child with dengue co-infection required platelet infusion. Antioxidant vitamins have been suggested for its treatment due to possibility of oxidative stress[7]. However, in most cases, thrombocytopenia resolves with the treatment of malaria as we saw in our cases. With increasing incidence of relapse after treatment with chloroquine (11.3 to 16%) and also reports of chloroquine resistant *P. vivax* cases[12], the disease spectrum of *P. vivax* in India seems to be changing and other antimalarials may be required to treat the malaria. All our patients were treated with quinine and responded well with parasite disappearance within 3.8 days of therapy.

Hence, we conclude that thrombocytopenia due to *P. vivax* malaria is increasing in India but usually disappears with the treatment of disease itself and requires no treatment by itself.

Acknowledgement

The authors thank Dr. Dod, Chief Senior Executive of B.J. Wadia Hospital for Children for giving permission to publish this article.

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Received: 24 January 2006 *Accepted in revised form:* 29 May 2006