Original Article

Frequency of Thrombocytopenia in Children Suffering from Malaria

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ABSTRACT

Objective: - To determine the frequency of thrombocytopenia in children suffering from malaria.
Study Design: Descriptive Study.
Place and Duration of Study: This study was carried out in pediatric department of Bolan Medical College Quetta during 18 months from April to October 2011.
Materials and Methods:- A total of 140 malaria parasite positive on peripheral film children from 6 months to 7 years of age hospitalized due to febrile illness were included in the study. Hematological parameters were determined by using automated analyzer. Those with reduced platelets count were reevaluated by manual method. Thick and thin smear stained with Giemsa for malaria parasite was studied by hematologist. Mild thrombocytopenia was labeled with platelets count < 150,000 to > 50,000 /cumm, moderate with platelets count of < 50,000 to > 20,000/cumm and severe with platelets count < 20,000/cumm.
Results: Out of 140 malaria parasite positive children, 100 (71.4%) had thrombocytopenia while 40 (28.6%) had normal platelets count. Mild thrombocytopenia was common in p falciparum 40% as compared to 14% in p vivax. Moderate and severe thrombocytopenia was common in p vivax 28% and 4% against p falciparum 12% and 2% respectively. 94 (67.1%) were male and 46 (32.9%) female.
Conclusion: Thrombocytopenia was found to be significant in children suffering from malaria. Mild thrombocytopenia was common in p falciparum but the moderate and severe thrombocytopenia was common in p vivax.
Key Word: Malaria, Plasmodium falciparum, Plasmodim vivax, Thrombocytopenia.

INTRODUCTION

Still malaria is one of the major health problems worldwide. Over three billion people live under the threat of malaria in 24 endemic countries[1]. Every year more than one million person in the world are suffering from this disease. It kills about 1-3 million people in the world every year [2]. In Pakistan half a million malaria cases occur annually and estimated fifty thousand deaths occur each year. The bulk of mortality is seen in children. Those who survive to childhood acquire significant immunity with low grade parasitemia and few symptoms [3]. Plasmodium vivax and plasmodium falciparum are the species responsible for the malaria in Pakistan [4]. In the last decade there has been a six time increase in plasmodium falciparum malaria which now comprises 42% of all malaria

Cases reported by the National Malaria Control Program[5]. Malaria is a major community problem in Baluchistan too. Malaria control program in its yearly report shows slide positivity rate 10.1% (p vivax, 6.6% p falciparum 3.5%) in 2004, 11.2% (6.6% p vivax, 4.6% p falciparum) in 2005 and 12.7% (8.2% p vivax, 4.4% p falciparum) in 2006. [6]. According to Sheikh et al, slide positive rate was 34.8% in Quetta during 1994 to 1998 [7]. In central area of Baluchistan (Mastung, Khuzdar district) 26.6% positivity rate was found in year 2004 to 2006 [8].

According to Yasinzai slide positivity rate was 16.2% in Quetta rural and 15.4% in Quetta urban, with slightly higher percentage of p falciparum 65.8% in rural and 55.5% in urban areas[9].

The pathology of malaria is related to anemia, cytokines release and in case of falciparum wide spread organ damage due to impaired microcirculation after blockage with red blood cell infected with parasite. Various degrees of reduced blood counts and mild to moderate thrombocytopenia is a common association of malaria but it is rarely associated with haemorrahgic manifestation or a component of disseminated intravascular micro vascular coagulation[10]. Though the anemia is hemolytic in nature, the hemopoietic response is blunted as evidence by disproportionate reticulocytes count. In tropical area malaria has been reported as one of the major cause of low platelet counts. The cause of thrombocytopenia is poorly understood. Malaria related thrombocytopenia may result from either a decrease in platelets production or increased platelets destruction by different mechanisms. Immune mediated lyses and sequestration in the spleen has been postulated. Abnormalities in platelets structure and function have been described as a consequence of malaria and in rare cases platelets can be invaded by malaria parasites themselves[11]. Tumor necrolysing factor and 1L-10 have been implicated in the development of p falciparum malaria induced anemia, but the role of these cytokine has not been studied in the development of

thrombocytopenia in patient with acute malaria[12]. A central mechanism is unlikely since increased number of megakaryocytes are found in patient with acute malaria.

MATERIALS AND METHODS

The study was conducted in Paediatric department of Civil Hospital Quetta. All hospitalized children from 6 months to 7 years of age suffering from febrile illness with peripheral blood film positive for malaria parasit were included in the study. Hematological parameters were determined by using automated analyzer. Those with reduced platelet counts reevaluated by manual method. Thick and thin smear were stained with Giemsa for malaria parasite and was studied by Hematologist. Patients with thrombocytopenia were divided into 3 categories:

1. Mild thrombocytopenia <150,000 to > 50,000/cumm
2. Moderate thrombocytopenia <50,000 to >20,000/cumm
3. Severe thrombocytopenia <20,000/cumm

Patients with history of bleeding disorder, dengue fever, cerebral malaria and drug intake such as Quinine, Sulphadoxine-Pyrimathamine, Thiazide and Co-trimoxazole were excluded. Data was analysed by SPSS Version 10.

RESULTS

A total of 140 children with malaria parasite positive were studied during 18 months period from April 2010 – October 2011. Out of 140 malaria cases 84 (60%) were positive for p falciparum and 56 (40%) were positive for p vivax (Table 1). No one was positive for p malare or ovale. 94 (67.1%) were male and 46 (32.9%) were female (Table 2) M:F ratio 2.04:1. Out of 140 cases 40 (28.6%) had normal platelet count, 100 (71.4%) had thrombocytopenia (Table 4.I). Out of 100 thrombocytopenic children mild thrombocytopenia was found in 54 (54%) cases, moderate in 40 (40%) and severe in 06 (6%) cases. Out of 54 mild thrombocytopenic children 40 (74.07%) were positive for p falciparum and 14 (25.93 %) were positive for p vivax . Moderate thrombocytopenia was found in 40 (40%) cases, out of them12 (30 %) were positive for p falciparam and 28 (70 %) were positive for p vivax. Severe thrombocytopenia was found in 6 (6%) cases, out 0f it 2 (33.3%) were positive for p falciparam and 4 (66.7%)were positive for p vivax .All patients were cured and discharged with no morbidity or mortality . None of them developed bleeding from any site and did not require blood or platelet transfusion. Mild thrombocytopenia was more common in p. falciparam (40%) as compared to p vivax (14%). Moderate and severe thrombocytopenia was common in p vivax (28%) and (4%) against (12%) and (2%) in p falciparum respectively (Table 4.II).

Table No.1: Distribution of Patient by Type of Plasmodium Type.

Plasmodium Type	Frequency	Percent
faciparum	84	60.0
vivax	56	40.0
Total	140	100.0

Table No.2: Distribution of Patient by Gender.

Gender	Frequency	Percent
male	94	67.1
female	46	32.9
Total	140	100.0

Table No.3: Distribution of Patients by age.

Age Group	Frequency	Percent
6 mon - 1 year	2	1.4
1-3 years	20	14.3
3-5 years	38	27.1
5- 7years	80	57.1
Total	140	100.0

Table No.4-I: Frequency of Thrombocytopenia in Cases of Malaria.

Platelet Counts	Frequency	Percent
Thrombocytopenia	100	71.4
Normal	40	28.6
Total	140	100.0

Table No.4-II: Frequency of Thrombocytopenia in Cases of Malaria

Platelet Counts	Frequency	Percent
50000-150000 mild	54	54
20000-50000 moderate	40	40
<20000 severe	6	6

Table No.5: Distribution of Patient by Platelet count type of Plasmodium

Platelets Count	Type of plasmodium		Total
	faciparum	vivax	
50000-150000 mild	40	14	54
20000-50000 moderate	12	28	40
<20000 severe	2	4	6
normal	30	10	40
Total	84	56	140

DISCUSSION

Malaria is one of the common causes of febrile illness in our country but the clinical diagnosis is difficult. Falciparam malaria is associated with a variety of complications and has high mortality. Thrombocytopenia is a common feature of acute malaria occur both in p falciparum and p vivax regardless of severity of infection in 60 – 80 % cases[13]. Prevalance of thrombocytopenia 78.4% of the

cases highlights the fact that a persistent normal platelet count is unlikely in the laboratory finding of malaria[14]. In this study thrombocytopenia was found in 67.1% of cases which is quite significant and comparable to the studies done by others as 71% by Robinson[15], 58.97 % by Rodriguez[16] and 70% by Memon[17]. Maximum thrombocytopenia occurs on fifth or sixth day of infection and gradually return to normal within 5 to 7 days after parasitemia ceased. It is a general consensus that thrombocytopenia is very common in malaria[18] and this is usually believed that it is more common in falciparum malaria. The results of our study show that although thrombocytopenia as a whole is more common in P falciparum 84% as compared to P vivax 56%, yet the moderate and severe thrombocytopenia is more common in p vivax 28% and 4% against the p falciparum 12% and 2% respectively. This is contrary to the common believe that the Severity of thrombocytopenia is common in p falciparum as proved by the study of India that the platelet count <20,000/cumm was noted in 1.5% of cases in children of p vivax against 8.5% cases of p falciparam[14]. Accorcding to a study of Pakistan in children thrombocytopenia was found to be more common in p vivax (72%) as compared to p falciparum (11%)[19]. Thrombocytopenia even when severe, statistically not associated with abnormal bleeding. The good tolerance of low platelet counts is well known in malaria[20]. It could be explained by platelet activation and enhanced aggregrability[21]. In conclusion thrombocytopenia found to be significant in malaria and in febrile illness mild to severe thrombocytopenia should alert the possibility of malaria. Very few data is available about thrombocytopenia in pediatric malaria. It needs further studies and data to know the significance of platelet in diagnosis and prognosis of malaria in children especially the severity of thrombocytopenia related to type of plasmodium

CONCLUSION

Thrombocytopenia was found to be significant in children suffering from malaria. Mild thrombocytopenia was common in p falciparum but the moderate and severe thrombocytopenia was common in p vivax.

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