FREQUENCY OF THROMBOCYTOPENIA IN CHILDREN WITH VIVAX MALARIA IN A TERTIARY CARE CENTRE

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ABSTRACT

Background and Aim: Malaria is a major health problem and one of the major killers in pediatric population particularly in the developing world. Malaria is endemic in our local population and the burden of malaria is constant since many decades. Malaria can results in many complications including thrombocytopenia. This pushed us to consider the objective of determining the burden of thrombocytopenia in our local population with vivax malaria. This study is designed to determine the frequency of thrombocytopenia in children aged 2 months to 15 years suffering with vivax malaria which will aware us with local magnitude of the problem.

Materials and Methods: This descriptive cross sectional study was performed in the department of pediatrics, Lady Reading Hospital, Peshawar from December 2016 to June 2017. A total of 384 children were included. All the patients were gone through a detailed history and clinical examination. After inclusion, 5 CC of blood was obtained in all the patients and were immediately sent to the hospital laboratory for detecting thrombocytopenia. All the laboratory investigations were done from single hospital laboratory under supervision of single pathologist.

Results: A total of 384 smear positive vivax malaria cases in pediatric age were studied. The mean age was 7 years with SD ± 8.85. Sixty eight percent patients were male while 32% patients were female. Forty Seven percent children had thrombocytopenia while 53% children didn't had thrombocytopenia.

Conclusion: Our study concludes that the frequency of thrombocytopenia was 47% in children aged 2 months to 15 years suffering with vivax malaria.

Key Words: thrombocytopenia, Vivax, Malaria.

INTRODUCTION

Malaria is a major health problem and one of the major killers in pediatric population particularly in the developing world. High mortality is usually compounded by various hematological complications if left untreated. Their identification as risk factors for progression to severe disease may make the basis for optimal management of malaria[1]. In one report 214 million malaria cases were reported worldwide in 2015. 275149 confirmed malaria cases and 56 deaths reported in pakistan[2]. Finding out the severity of thrombocytopenia is perhaps equally important, as it has practical as well as prognostic implications[3]. Despite not being a criterion for severe malaria, thrombocytopenia is one of the most common complications of both Plasmodium vivax and Plasmodium falciparum malaria. In a systematic review of the literature, platelet counts under 150,000/mm^3 ranged from 24-94% in patients with acute malaria and this frequency was not different between the patients with P. vivax infection and may be explained by medullary compensation with the release of large platelets in the peripheral circulation by megakaryocytes, thus maintaining a good primary haemostasis. The speculated mechanisms leading to thrombocytopenia are: coagulation disturbances, splenomegaly, bone marrow alterations, antibody-mediated platelet destruction, oxidative stress and the role of platelets as cofactors in triggering severe malaria[4].

In one local study, performed in Ayub Medical college abbottabad, it was found that out of 374 children with malaria, 51.3% had thrombocytopenia[3]. In one study done to find out mortality due to thrombocytopenia in malaria showed that out of 215479(23.4%) thrombocytopenia patients, 66421(30.8%) patients had clinical malaria. In total, 1.3% of patients (2701 of 215479) died[5]. Another study done in America from 2009 to 2013, descriptive, retrospective case series of 16 severe vivax malaria of which 25% cases developed severe thrombocytopenia[6,7].

While going thorough literature search, it has been observed that hematological derangements are important complication of malaria. This pushed us to consider the objective of determining the burden of thrombocytopenia in our local population with vivax malaria. Malaria is endemic in our local population and the burden of malaria is constant since many decades. This study will be benificial in determintion of the local magnitude of the problem and its result will add up to existing literature of complications of malaria.

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MATERIALS AND METHODS

This study was conducted in the department of Peadiatrics, Lady Reading Hospital, Peshawar from Decemeber 10, 2016 to June 10, 2017. Sample size was calculated through WHO Sample size calculator. A total of 384 patients were included. This was a decriptive cross-sectional study and non-probability consective sampling technique was used. Patients included were having age 2 months to 15 years, seen in pediatrics department of this hospital, having smear positive vivax malaria where smear is performed in this hospital own laboratary by the senior pathologist. Both gender patients were included. While those patients with falcifarm malaria, ICT positive but smear negative vivax malaria and patients with thrombocytopenia but smear negative vivax malaria were excluded.

This study was conducted after approval from hospital ethical and research committee. All patients meeting the inclusion criteria and presenting with vivax malaria (as per operational definition above) was enrolled in the study through OPD Department. The purpose and benefits of study was explained to the patients and an informed consent was obtained.

All the included patients were have a detailed history and clinical examination. After inclusion, 5 CC of blood was obtained in all the patients and were immediately sent to the hospital laboratory for detecting thrombocytopenia. All the laboratory investigations were done from hospital own laboratory under supervision of senior pathologist. All the above-mentioned information including name, age, gender and address was recorded in a pre-designed Performa. Strictly exclusion criteria were followed to control confounders and bias in the study results.

Data was analysed using SPSS version 17. Mean and standard deviation was calculated for numerical variables like age and platelets count. Frequencies and percentages were calculated for categorical variables like gender and thrombocytopenia. Thrombocytopenia was stratified among age and gender to see effect modification. Post stratification chi-square test was applied, P value ≤ 0.05 was considered as significant value. All the results were presented in the form of tables or charts.

RESULTS

In this study a total of 384 patients were studied. The age distribution was analyzed as 38(10%) children were in age range < 1 year, 104(27%) children were in age range 2-5 year, 115(30%) children were in age range 6-10 year, 127(33%) children were in age range 11-15 year. Mean age was 7 years with SD ±8.85 (Table 1).

Gender distribution was analyzed as 261(68%) patients were male while 123(32%) patients were female (Table 2).

Status of platelets count was analyzed as 180(47%) children were had platelets count < 150,000 IU/L and 204(53%) children were had platelets count > 150,000 IU/L. Mean platelets count was173,000 IU/L with SD ± 114.73. (Table 3).

Frequency of thrombocytopenia was analyzed as 180(47%) children had thrombocytopenia while 204(53%) children didn't had thrombocytopenia. (Table 4).

Stratification of thrombocytopenia with respect to age and gender is given in table No 5,6.

DISCUSSION

Malaria is a major health problem and one of the major killers in paediatric population particularly in the developing world. High mortality is usually compounded by various haematological complications if left untreated. Their identification as risk factors for progression to severe disease may make the basis for optimal management of malaria[1,7,8]. In one report 214 million malaria cases were reported worldwide in

Table No 1: Age Distribution (n=384)

Age	Frequency	Percentage
< 1 year	38	10%
2-5 years	104	27%
6-10 years	115	30%
11-15 years	127	33%
Total	384	100%

Mean age was 7 years with SD ± 8.85

Table No 2: Gender Distribution (n=384)

Gender	Frequency	Percentage
Male	261	68%
Female	123	32%
Total	384	100%

Table No 3: Platelets Count (n=384)

Platelets count	Frequency	Percentage
< 150,000 IU/L	180	47%
>150,000 IU/L	204	53%
Total	384	100%

Mean platelets count was173,000 IU/L with SD ± 114.73

Table No 4: Thrombocytopenia (n=384)

Thrombocytopenia	Frequency	Percentage
Yes	180	47%
No	204	53%
Total	384	100%

Table No 5: Stratification of Thrombocytopenia w.r.t age (n=384)

Thrombocytopenia	18-30 years	31-40 years	41-50 years	51-60 years	Total
Yes	18	49	54	59	180
No	20	55	61	68	204
Total	38	104	115	127	384

Chi square test was applied in which P value was 0.9994

Table No 6: Stratification of Thrombocytopenia w.r.t Gender (n=384)

Thrombocytopenia	Male	Female	Total
Yes	122	58	180
No	139	65	204
Total	261	123	384

Chi square test was applied in which P value was 0.9399

2015. Similerly 275149 confirmed malaria cases and 56 deaths were reported in pakistan[2]. Thrombocytopenia is one the significant hematological complication and finding out the severity of thrombocytopenia is equally important, as it has practical as well as prognostic implications[3,9,10]. Despite not being a criterion for severe malaria, thrombocytopenia is one of the most common complications of both Plasmodium vivax and Plasmodium falciparum malaria[4,9,11].

In our study we found the mean age of our patients 7 years with SD ±8.85. Sixty eight percent patients were male while 32% patients were female. Forty Seven percent children had thrombocytopenia while 53% children didn't had thrombocytopenia.

Similar results were found in another study conducted by Hafeez M et al[12] in which out of 374 children with malaria, 51.3% had thrombocytopenia. In one study done to find out mortality due to thrombocytopenia in malaria showed that out of 215479(23.4%) thrombocytopenia patients, 66421(30.8%) patients had clinical malaria. In total, 1.3% of patients (2701 of 215479) died[7]. Similar studies have significant frequency of thrombocytopenia in children suferring with malaria specially vivax[13-16]

Similar results were found in another study conducted by Gupta NK et al[17] in which 230 patients were observed: 130 (56.51%) were positive for *Plasmodium vivax*, 90 (39.13%) were positive for *P. falciparum* and 10 (4.34%) had mixed infection with both *P. vivax* and *P. falciparum*. Out of 130 cases detected with *vivax* malaria, 100 cases had thrombocytopenia. Out of 90 cases detected with *falciparum* malaria, 70 cases had thrombocytopenia. Among 10 cases of mixed infection, 9 cases had thrombocytopenia. Similar results were found in another study conducted by O'Brien AT et al[18] in which 16 severe vivax malaria patients, of which 25% cases developed severe thrombocytopenia.

CONCLUSION

In our study shows that the frequency of thrombocytopenia is much more common vivax malaria than usually thought and 47% of our pediatrics patients (aged 2 months to 15 years) suffering with vivax malaria had thrombocytopenia.

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