International Journal of Contemporary Pediatrics
Subramanian V et al. Int J Contemp Pediatr. 2019 Jan;6(1):131-134
http://www.ijpediatrics.com
pISSN 2349-3283 | eISSN 2349-3291

DOI: http://dx.doi.org/10.18203/2349-3291.ijcp20185195

Original Research Article

Thrombocytopenia in children: a clinico-etiological profile in an urban tertiary care hospital

Subramanian V.[1], Santosh Kumar K.[2]*

[1]Department of Pediatrics, [2]Department of Neonatology, Saveetha Medical College and Hospital, Chennai, Tamil Nadu, India

Received: 02 October 2018
Accepted: 31 October 2018

***Correspondence:**
Dr. Santosh Kumar K.,
E-mail: drsantoshkmc03@gmail.com

ABSTRACT

Background: Thrombocytopenia is a common haematological finding that we come across while managing a sick child. Etiological profile and presentation of thrombocytopenia varies among children. The objective of this study was to study the clinical and laboratory profile of children with thrombocytopenia, associated clinical complications and assess the relationship between platelet levels and severity of disease.
Methods: The study was carried out in 644 children between 1 month and 12 years, admitted in Paediatric Department of Raja Rajeshwari medical college and hospital, Bangalore between August 2012 to August 2014.
Results: The commonest causes of thrombocytopenia in our study were of infectious aetiology (86.6%). Among Infections Viral infections were the major cause in more than 78% of cases. Other causes included haematological problems, drug induced thrombocytopenia and connective tissue disorders. Bleeding manifestations were present in 33.07% of patients and the commonest bleeds were skin and mucous membranes. Bleeding manifestations were seen most commonly in children with a platelet count less than 50000/µl.
Conclusions: Viral Infections were the commonest cause for thrombocytopenia in Children. Platelet count was neither predictive of bleeding manifestations nor predictive of need for platelet transfusion.

Keywords: Bleeding manifestations, Platelet transfusion, Thrombocytopenia, Viral fever

INTRODUCTION

Thrombocytopenia is a common presentation of many febrile and few non-febrile illness in children.[1] The common febrile illness in children like dengue ,viral fever, malaria and enteric fever are associated with thrombocytopenia .Thrombocytopenia is defined as platelet count less than 150000/µl while severe thrombocytopenia is defined as platelet count less than 50000/µl.[2] Pesudo-thrombocytopneia can occur due to use of excessive EDTA while sampling.[3]

Platelets or thrombocytes are small (1-4 um in diameter) cells which are critical in the initiation of primary haemostasis when the vascular endothelium is disrupted. Excessive bleeding occurs if primary haemostasis is abnormal because of any defective number or function of platelets. The quantitative defect of platelets is more common when compared to qualitative defect. Presentation of platelet type of bleeding is characterised by petechaie and purpura. Platelet count is essential in the evaluation of any child with a history of bleeding manifestations because thrombocytopenia is the most common of the acquired cause of a bleeding diathesis in children. The causes of thrombocytopenia broadly fall into three categories namely, increased platelet destruction, decreased platelet production or excessive platelet sequestration. When a patient with

thrombocytopenia is assessed, the risk of bleeding episodes should be estimated. If the risk is significant, treatment is warranted. There is a direct correlation between platelet count and risk of bleeding. The risk of haemorrhage is affected by many factors, such as associated coagulation defects, trauma, and surgery. In children serious spontaneous bleeding does not occur until the platelet count is less than 20,000/ul. Hence many physicians use a platelet count of 10,000 to 20,000/ul as the threshold for intervention. This study was done to determine the aetiology and clinical presentation of thrombocytopenia among Indian children attending a tertiary care hospital. To study the etiologic profile, clinical presentation, and the outcome of thrombocytopenia in children between 1 month-12 years attending a tertiary care hospital.

METHODS

A prospective descriptive study was conducted in the Department of Paediatrics, Raja Rajeshwari medical college and hospital between August 2012 and August 2014.All children who presented with platelet count less than $150x10^9$ cells/µl were included in the study.

Children who were managed as outpatient were excluded from the study. Demographic data such as age, gender and the presenting symptoms including the history of drug intake were recorded as per the Performa.

The type of bleeding manifestation namely petechiae, purpura, ecchymosis (as cutaneous bleeds), hemetemesis, melena, epistaxis (as mucosal bleeds) and any major bleeds were recorded and analysed.

Laboratory parameters such as platelet count, coagulation parameters (PT, aPTT, Bleeding and clotting time). Complete blood counts were determined by using automated analyser.

For children with thrombocytopenia manual recheck was performed using thick and thin smears. The morphology of platelets, presence of atypical lymphocytes, blasts and malarial parasites were documented.

Bone marrow examination, dengue serology and other work up were done in necessary cases. The management and outcome of the children were also documented and analysed.

RESULTS

A total of 644 children were admitted in with thrombocytopenia. The demographic data on age, sex distribution and severity of thrombocytopenia, the etiological profile and outcomes were studied.

There was a near equal distribution of children with thrombocytopenia in the age group 1 to 5 years and 5 to 10 years with both being around 30% of the total cases. There was a male predominance with nearly 54% cases being males (Table 1).

Table 1: Study population demographics.

Total no. of children with thrombocytopenia studied	644
No. of male children	344
No. of female children	300
Age group	
<1 year	135
1 to 5 years	190
5 to 10 years	192
>10 years	127
Platelet count (cells/µl)	
<20000	60
20000 to 50000	242
50000 to 100000	186
>100000	156

Around 33% of those children with thrombocytopenia had bleeding manifestations. Cutaneous bleeds were the most common presentation of bleeds with around 49.1 % of the children having cutaneous bleeds. 27.2 % Children had mucosal bleeds.

Other bleeding manifestation like melena, hematemsis, epistaxis were less than 23%. Regarding etiology of thrombocytopenia most of the cases were due to infectious etiology (86.6%), Other causes included connective tissue disorders, Hematological problems, drug induced thrombocytopenia.

Among the infective causes for thrombocytopenia that were analysed predominant children were affected by Viral fevers including dengue (78%) (Table 2).

Table 2: Etiology of thrombocytopenia.

Total cases	644
Infections causes	558
Dengue	330
Malaria (P. Vivax)	15
Malaria (P. falciparum)	4
Enteric fever	22
Chikunguniya	21
Tuberculosis	3
Sepsis	23
Other viral illness	84
Malignancies	39
Connective tissue disease	5
Hematological (ITP/Thalassemia /Heriditary sperocytosis/Megaloblastic anaemia)	23
Drug induced	7
Others	12

Initial clinical presentation in the hospital in majority of the patients was fever, headache, body ache and joint pain followed by gastrointestinal symptoms like

abdominal pain and vomiting (Table 3). We had 5 mortality in the study group and all were due to dengue.

Table 3: Clinical presentation.

Presentation	% of cases
Fever	91.3
Headache	68.13
Myalgia	70.6
Arthalgia/arthritis	61.13
Abdominal pain	50.77
Vomiting	24.7
Loose stools	29.8
GI bleed	13.19
Cough	11.18
Hematuria	9.93
Shock /hypotension	13.19
Abnormal RFT	18.32
Abnormal LFT	34.06
Rash /Petechia /mucosal bleed	76.2

Children with counts between 20000 to 50000/µl was the majority with bleeding manifestations .In our study 9.3% children had a count less than 20000/µl. 37.6% had a count between 20000 to 50000 /µl while 28.9% children had a count between 50000 and 100000 and 24.2% had a platelet count more than 100000.Bleeding manifestations were invariably present in all groups, more in platelet count below 20000 (Table 4).

Table 4: Bleeds in thrombocytopenia and need for blood products.

Platelet count Cells/µl	No. of cases	Bleeding manifestations No. of episode	Children who were transfused
<20000	60	30	18
20000-50000	242	81	10
50000-100000	186	70	6
>100000	156	32	Nil

DISCUSSION

Thrombocytopenia is a common finding in a sick child. It is very common manifestation of viral haemorrhagic fevers like Dengue and other Non-dengue infections including enteric fever and malaria. Transient reduction in the platelet count occurs in other systemic illness like connective tissues disorders and Immune mediated thrombocytopenia. Thrombocytopenia is also a common manifestation of fungal, bacterial infections (gram negative) and malignancies. We studied the clinico-ethiological profile of children with thrombocytopenia admitted in our hospital. Our study included 644 children found to be having thrombocytopenia. Among the 644 children studied the commonest aetiology in our study was infectious diseases of which viral infections were the common cause accounting for nearly 78 % of the cases. Other infections like enteric fever, malaria were also noted. A study done at Delhi[4] recently demonstrated the commonest causes of thrombocytopenia was viral fever (other than dengue and chikungunya) 27.78%, followed by Dengue 22.2%, enteric fever 12.22%, chikungunya 11.11% and malaria 8.33% Which is similar to our results. Adult studies like the one done by Nair in New Delhi, showed septicemia (26.6%) to be the major cause of thrombocytopenia Similar to present study, Kumaran also found viral fever to be the commonest cause in 50.3% cases.[5,6] In another study done by Gandhi malaria was found to be the major cause in 41.07%.[7] Similarly, Lakum, also found malaria as the most common cause of febrile thrombocytopenia in 46.8% of the cases.[8] These differences could be possibly explained by the seasonal variations. Another study done by Bhalara, showed dengue (60.8%) as the main aetiology.[9] There was a predominance of male children compared to female children. The commonest age group affected was 5 to 10 years accounting for nearly 30 % of all cases. Children between 1 to 5 years and 1 month to 1 year contributed to 59 % of all the cases. This could possibly be explained by the prolonged outdoor activities by grown up children compared to infants and increased exposure to mosquito bites. These were similar to the results from other studies. The common clinical presentation other than fever in our study included headache (68.1%), body ache (70.60%) and joint pains (61.13%). This could possibly be explained by the fact that most of our cases were of viral illness, dengue and chikungunya. Similar results were shown by Khan et al who showed chills and rigors in 80%, myalgia in 70%, vomiting in 60%, headache in 50% and rash in 25% as the common presentation in his study.[10] 213 Children of the 644 children admitted with thrombocytopenia had bleeding manifestations Among the Bleeding manifestations ,Cutaneous and mucosal bleeds were the most common presentations accounting for nearly 49.1% and 27.1 % respectively. Around 23% of children either has Haematemesis, melena and epistaxis, haematuria, subconjunctival haemorrhage or intracranial haemorrhage. These finding are similar to the results of Nair et al where he found 57.7% children presenting with spontaneous bleeds and nearly 42% having cutaneous bleeds.[4] Contrary to our results in a study done by Patil et al petechiae was the major manifestation in 73.9% followed by spontaneous bleeding only in 26.9%.[11] Lohitashwa et al, also showed that purpura (63%) was the commonest bleeding manifestations followed by spontaneous bleeding (37%) in his study.[12] Severe thrombocytopenia (<50000/µl)was noted in 43.9 % of children with thrombocytopenia. While 28.9 % children had counts between 50000 to 100000 /µl and 24.2 % had counts above 100000/ µ l. Bleeding manifestations were noted predominantly in children with counts between 20000 to 50000/ µl and in children with counts between 50000 to 100000 / µl. These two groups of children contributed to nearly 70 % of all the bleeding manifestations. Children with counts less than 20000/µl and children with counts more than

100000/µl contributed to 14.08 % and 15.02 % of all children with bleeding manifestations respectively. These findings are contrary to findings by Nair et al where he noticed a predominance of bleeding manifestation in children with platelet count less than 10000/µl.[4] Among children with platelet count less than 20000/µl nearly 50 % of them did not have any bleeding manifestations while nearly 39% of children with counts more than 50000/µl had some bleeding manifestation. This demonstrates that platelet count is not a major predictor of bleeding in children with thrombocytopenia though children with counts less than 20000/µl need to be monitored closely. Among children who were transfused with blood products it was noticed that children with counts less than 20000/µl received the maximum platelet transfusion accounting for nearly 53% of transfusions. It has been demonstrated from our study that platelet counts are neither predictive of major bleeds nor are they predictive of mortality in children with thrombocytopenia which are similar to the current thinking and also similar to previous published studies by Nair et al.[4]

CONCLUSION

Thrombocytopenia is a common haematological observation in the evaluation of a sick child. This entity is commonly due infections like viral illnesses, dengue, malaria, enteric fever etc. Common presentation of Severe thrombocytopenia is usually Muco-cutaneous bleeds. However, the platelet counts were not predictive of bleeding manifestations in our study. Further platelet counts are also not predictive of mortality.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Gandhi AA, Akholkar PJ. Clinical and laboratory evaluation of patients with febrile thrombocytopenia. Natl J Med Res. 2015;5(1):43-6.
2. Suresh P, Devi CY, Ramesh Kumar C, Jalaja Y. Evaluation of the cause in fever with thrombocytopenia cases. J Evidence Based Med Healthcare. 2015;2(15):2134-7.
3. Nagler M, Keller P, Siegrist D, Alberio L. A case of EDTA dependent pseudo-thrombocytopenia: simple recognition of under diagnosed and misleading phenomenon. BMC Clin Pathol. 2014;14(1):19
4. Nair BT, Sharma K, Paimode SD. A study of clinical and laboratory profile of febrile children presenting with thrombocytopenia. Int J Contemp Pediatr 2017;4(6):2114-9.
5. Nair PS, Jain A, Khanduri U, Kumar V. A study of fever associated with thrombocytopenia. JAPI. 2003;1151-73
6. Kumaran C. Incidence (prevalence) and causes of thrombocytopenia at a tertiary health care cen-tre, Oxford Medical College Hospital, Attibele, Anekal, rural part of Bangalore. J Evid Based Med Healthc. 2016;3(32):1516-21.
7. Patel U, Gandhi G, Friedman S, Niranjan S. Thrombocytopenia in malaria. J Nat Med Assoc. 2004;96(9):1212.
8. Lakum N, Makwana H, Shah R. A study of laboratory profile of fever with thrombocytopenia in adult patients at C.U. Shah Medical College, Surendranagar. SEAJCRR. 2014;3(1):556- 61.
9. Bhalara SK, Shah S, Goswami H, Gonsai RN. Clinical and etiological profile of thrombocytopenia in adults: a tertiary-care hospital-based crosssectional study: Int J Med Sci Public Health. 2015;4(1):7-10.
10. Khan AH, Hayat AS, Masood N, Solangi NM, Shaikh TZ. Frequency and clinical presentation of dengue fever at tertiary care hospital of Hyderabad/Jamshoro. JLUMHS. 2010;9(2):88-94.
11. Patil P, Solanke P, Harshe G. To study clinical evaluation and outcome of patients with febrile thrombocytopenia. Int J Sci Res Publications. 2014;4(10):01-03.
12. Lohitashwa SB, Vishwanath BM, Srinivas G. A Study of Clinical and Lab Profile of Fever with Thrombocytopenia. JAPI. 2009:57.

Cite this article as: Subramanian V, Kumar SK. Thrombocytopenia in children: a clinico-etiological profile in an urban tertiary care hospital. Int J Contemp Pediatr 2019;6:131-4.