ORIGINAL ARTICLE

Haematological causes of thrombocytopenia in children at Aga Khan University Hospital, Karachi

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Abstract

Objectives: To identify the haematological causes of thrombocytopenia in children admitted at a tertiary care hospital.

Methods: The prospective, descriptive study was carried out at the Aga Khan University Hospital, Karachi, from September 3, 2009 to March 3, 2010, and comprised children between one month and 14 years of age with platelet count less than15000. After reviewing the record, a questionnaire was filled and data was analysed using SPSS 15.

Results: Out of 108 patients in the study, 69(64%) were male and 39(36%) were female. The overall mean age was 69±46.54 months (range: 12-168 months). The mean platelet count was 59.8±46.1/µl (range: 1,000-149,000/µl). Besides, 24 (22.2%) children had mild thrombocytopenia, 34(31.5%) had moderate and 50(46.3 %) had severe thrombocytopenia. The causes of haematological thrombocytopenia in descending order of frequency was acute lymphoblastic leukaemia 17(15.7%), idiopathic thrombocytopenic purpura 10(8.3%) and aplastic anaemia 5(4.6%).

Conclusion: Acute lymphoblastic leukaemia was the commonest cause of haematological thrombocytopenia followed by idiopathic thrombocytopenic purpura and aplastic anaemia.

Keywords: Thrombocytopenia, Children, Causes, Hospital. (JPMA 65: 347; 2015)

Introduction

Platelets are non-nucleated, cellular fragments produced by the megakaryocytes of the bone marrow. As the megakaryocyte reaches maturity, fragmentation of cytoplasm occurs and large numbers of platelets are liberated. Thrombocytopenia is defined as a platelet count of less than 150,000/mm^3.[1] Thrombocytopenia is mild if the platelet count is less than 150,000/mm^3, moderate if it is between 150,000 and 10,000/mm^3, and severe if it is less than 50,000/mm^3. Under normal conditions platelets have a life span of 10 days, which means that every day 10% of platelets are lost and the same number of them are produced by the bone marrow to replace this loss of platelets.[2]

Thrombocytopenia is caused either by inadequate production or by excessive destruction or removal of platelets. Inadequate production is almost always a result of marrow dysfunction, with decrease in number of megakaryocyte. By contrast, in the thrombocytopenia caused by increased destruction, megakaryocytes are quantitatively normal or increased. Hypo-megakaryocytic thrombocytopenia results from aplasia of the marrow or from its infiltration by abnormal neoplastic tissue.[2]

Most common causes of thrombocytopenia, including haematological as well as non-haematological, include diminished production due to vitamin B12 and folic acid deficiency, leukaemia, sepsis, systemic viral, bacterial and protozoal infections such as dengue fever, typhoid and malaria. Increased destruction occurs in idiopathic thrombocytopenic purpura (ITP), thrombotic thrombocytopenic purpura (TTP), haemolytic uraemic syndrome (HUS), systemic lupus erythematosus (SLE), and neonatal alloimmune thrombocytopenia (NAIT).[3] It could be due to medication also.[4]

The clinical manifestations of thrombocytopenia include petechiae, purpura, gingival, gastrointestinal (GI) and intracranial bleeding.[5] Common sites of bleeding are gum and nose. Rare and devastating complication is intracranial bleeding.[5]

Treatment of thrombocytopenia depends on the cause of thrombocytopenia. Effective treatment varies with the underlying cause and may include corticosteroids or immune globulin (Ig) to increase platelet production. Platelet transfusions are helpful in thrombocytopenia only in treating complications of severe haemorrhage.[6] Splenectomy may be performed in patients who have persistent thrombocytopenia due to platelet destruction.[6] Family history of bleeding may be present in 64% of genetic bleeding disorders.[7]

Though a lot of data is available about causes of thrombocytopenia, there is a paucity of local data

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regarding haematological causes of thrombocytopenia. Hence this study was planned to look at the haematological causes of thrombocytopenia in our population presenting to a tertiary care hospital. The study will increase the availability of local data and may help our paediatricians in better diagnosis and management of children with thrombocytopenia.

Patients and Method

The prospective, descriptive study was carried out at the Department of Paediatrics and Child Health of the Aga Khan University Hospital, Karachi, from September 3, 2009 to March 3, 2010, and comprised children between one month and 14 years of age with platelet count less than 15000.

Patients with known diagnosis of malignancy or undergoing chemotherapy and having abnormal coagulation profile were excluded. All children admitted to the ward who had complete blood count (CBC) done, were screened for inclusion in the study. Data was collected prospectively and included age, gender, platelet count and causes of thrombocytopenia. Severity of platelet count was defined as "mild" with platelet count from 100,000 to 150,000/µl; "moderate" with platelet count from 50,000 to 100,000/µl; and "severe" with platelet count less than 50,000/µl.

Causes of haematological thrombocytopenia studied included acute lymphoblastic leukaemia (ALL), aplastic anaemia (AP), and ITP. Data was entered into computer and analysed using SPSS 15. Results are presented as mean standard deviation (SD).

Results

Out of 108 patients in the study, 69(64%) were male and 39(36%) were female. The overall mean age was 69±46.54 months (range: 12-168 months).

Overall, 24 (22.2%) children had mild thrombocytopenia, 34 (31.5%) had moderate and 50(46.3%) had severe thrombocytopenia. The mean platelet count was 59.8±46.1µl (range: 1,000-149,000/µl).

The causes of thrombocytopenia were ALL 17(15.7%), ITP 10(8.3%) and Aplastic anaemia 5(4.6%).

Discussion

Thrombocytopenia is a common occurrence in children and contributes significantly to morbidity and mortality. It is, therefore, imperative for a paediatrician to understand the most common causes and their pathogenesis. This becomes all the more important when one is to chalk out the management plan geared to prevent the multifarious complications.

Since disorders leading to thrombocytopenia are varied, the differential diagnosis has a wider spectrum. One should, therefore, look into the causes leading to decreased production or the factors that bring about an increased destruction or even both.

This was a case series study in which we tried to find the haematological causes of thrombocytopenia in children with platelet count less than 1500,000/µl.

A few studies in children have been conducted in other countries as well. A study of 100 cases reported ITP in 32%, aplastic anaemia in 24%, ALL in 22%, lymphoma in 4%, HUS in 4%, megakaryocytic hypoplasia in 3%, drug-induced thrombocytopenia in 3%, hypersplenism in 3%, neonatal in 2%, malaria 2%, leishmaniasis in1% cases of thrombocytopenia in children. In our study ALL was the major cause of haematological thrombocytopenia. Our results contradict the earlier study. This correlates well with the findings of another study[9] which showed ALL 76 (17.92%) to be the most common malignant haematological disorder.

In our study there was predominance of male overall with male-female ratio of 1.7:1 and also in cases of ALL, which is comparable to results reported earlier.[10] However, in one study,[8] female predominance was seen in cases of ITP with a ratio of 1:1.9. One study[11] reported male predominance which could be due to socio-cultural reasons where male children are often given preferences even in treatment of illnesses.

It is important to note that our paediatric department has well-developed oncology unit and that could be a reason that we found more cases of ALL compared to ITP as the common cause of thrombocytopenia in children as reported earlier from Peshawar.[8] Also, our sample size was small and the study should to be repeated with a larger sample size. However, it is important to note that along with laboratory tests, one should go for the platelet count as well; as early detection and correction of thrombocytopenia can certainly improve the prognosis of various clinical conditions.

Conclusion

ALL was the commonest cause of haematological thrombocytopenia followed by ITP and Aplastic anaemia, but low platelet count may occur in many other haematological conditions as well.

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