Singapore Med J 1998; Vol 39(11):485-487

Thrombocytosis in Childhood

J T Heng, A M Tan

ABSTRACT

Introduction: Thrombocytosis is a common condition in infancy and childhood. There are very few paediatric literature on its incidence and clinical significance.

Method: We conducted a prospective study over 18 months (January 1993 to June 1994) on all patients admitted with a platelet count done. Cases with platelet count > 600 x 10^9/L were reviewed and followed-up. Serial platelet count were done at 1 week, 2 weeks, 3 weeks, 4 weeks, and then monthly until it normalised.

Results: One hundred and thirty-five cases out of 10,288 admissions had raised platelet count. There was a preponderance of male (sex ratio M:F = 1.7:1). Majority was less than 1 year old. Seventy-eight percent had associated infection of which 2/3 were due to bacterial infections. Pneumonia was the most common bacterial infection associated with thrombocytosis whilst gastroenteritis was the most common cause for non-bacterial infection and Kawasaki's disease constituted the majority of the non-infective etiology. Cases with platelet count > 900 x 10^9/L, 73.3% were due to bacterial infection. Three cases of Kawasaki's disease had platelet counts > 900 x 10^9/L. Fifty-two percent of cases developed thrombocytosis within 4 days of illness. In non-bacterial infection, the thrombocytosis normalised by about 1 week after onset. For bacterial infection, the thrombocytosis normalised later depending on the severity of infection. In majority of the Kawasaki's disease, the platelet count normalised by the third week.

Conclusion: Primary thrombocytosis is rare in paediatric age group. None of the cases developed any symptoms associated with thrombocytosis. Secondary thrombocytosis is a benign and common phenomenon in children.

Keywords: thrombocytosis, childhood, infection, benign

Department of Paediatric Medicine
KK Women's and Children's Hospital
100 Bukit Timah Road
Singapore 229899

J T Heng, MBBS, M Med (Paed), FAMS
Consultant

A M Tan, MBBS, M Med (Paed), FAMS
Senior Consultant

Correspondence to:
Dr J T Heng

INTRODUCTION

Thrombocytosis in infancy and childhood is not an uncommon condition. There are very few local paediatric literature on its incidence and clinical significance. This is probably because platelet count involves tedious manual counting. Furthermore, primary thrombocytosis is extremely rare in childhood. It is usually secondary to other underlying conditions.

With the introduction of electronic blood cell counter, platelet count can be part of the routine haematological profile. For this prospective study, we reviewed all admitted patients with platelet count exceeding 600 x 10^9/L.

METHOD

This study was conducted in the Paediatric Department of Tan Tock Seng Hospital from 1 January 1993 to 30 June 1994. All admitted patients who had their platelet count done were included in the study. Patients with platelet count exceeding 600 x 10^9/L were followed-up with serial platelet counts. These were done at week 1, week 2, week 3, week 4 and subsequently, monthly until the platelet counts normalised. The venous or capillary blood specimens were collected in EDTA coated bottles or capillary tubes. The platelet count was done using the electronic counter.

RESULTS

A total of 10,288 patients were admitted during the study period. One hundred and thirty-five patients had platelet count exceeding 600 x 10^9/L during the course of their illness. Eighty-five were males and 50 were females. The sex ratio was 1.7:1. Majority of the patients were less than 1 year old (Fig 1). There were 64.4% Chinese, 26.7% Malays, 7.4% Indians and 1.5% other races.

Infection was the most common cause of thrombocytosis (105/135; 77.8%). Majority of these were secondary to bacterial infection, whereas pneumonia was the most common bacterial infection associated with thrombocytosis (Table I).

Fifteen patients had platelet count above twice the upper limit (900 x 10^9/L). Eleven patients were due to bacterial infection, 3 patients had Kawasaki's disease and one developed thrombocytosis following viral hepatitis (Table II). In 52.3% of the patients, the onset of thrombocytosis occurred within 4 days of the illness and 73.3% by the first week of the illness (Table III).

Forty-six patients had repeated platelet counts done until the thrombocytosis resolved. In the non-bacterial infection group, majority of the thrombocytosis normalised in 1 week after onset

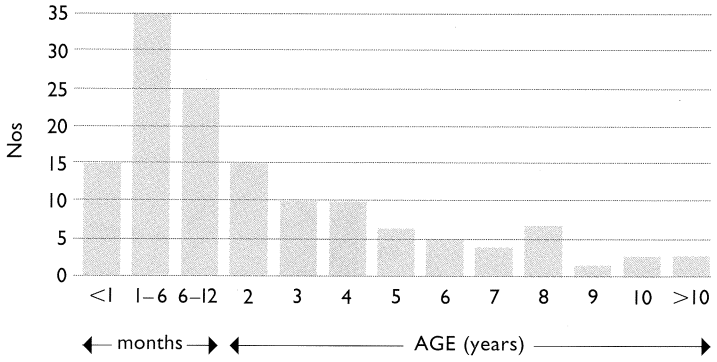

Fig 1

Table I – Causes associated with thrombocytosis

Bacterial infection		Non-bacterial infection		Non-infective cause	
Pneumonia	37	Gastroenteritis	18	Kawasaki's disease	9
UTI	12	Viral fever	10	Epilepsy on treatment	4
Sepsis/abscess	6	Bronchiolitis	7	Fe deficiency	3
Meningitis	5	URTI	5	NNJ	6
Other CNS infection		Hepatitis	2	On chemotherapy	6
Bacterial tonsillitis	1			Lymphoma	1
				ITP (recovering)	1
Total = 63 (46.7%)		Total = 42 (31.1%)		Total = 30 (22.2%)	

Table II – Platelet count > 900 x 10^9/L vs cause

Illness	Numbers
Viral hepatitis	1
Kawasaki's disease	3
Meningitis	2
CNS infection	2
UTI	1
Pneumonia	6

Table III – Day of illness platelet count > 600 x 10^9/L

Day of illness	Bacterial infection	Non-bacterial infection	Total
1 – 4 days	24	31	55 (52.3%)
5 – 7 days	15	7	22 (21.0%)
8 – 14 days	17	3	20 (19.0%)
> 2 weeks	7	1	8 (7.7%)
Total	63	42	105 (100%)

(Fig 2). In the bacterial infection group, the thrombocytosis was noted to normalise later depending on the severity of the inflammation (Fig 3). In one patient with haemophilus B meningitis and septic arthritis, the thrombocytosis normalised 35 days after the onset of illness. In patients with Kawasaki's disease, the high platelet count seemed to normalise by the third week (Fig 4).

No complication associated with thrombocytosis was observed during the study period and specific treatment was required for the raised platelet count. Aspirin was used in all the patients with Kawasaki's disease as part of the treatment regime.

DISCUSSION

Thrombocytosis is not an uncommon condition in the paediatric age group. The incidence depends on the cut-off point for platelet count and the population studied because of the higher incidence in neonates. It has been estimated that the incidence of thrombocytosis is between 0.04% to 2%[1-3]. In our study, the incidence was 1.32%. Majority was male and less then 1 year old.

Primary thrombocytosis is extremely rare in childhood[4]. It is usually an acute phase reactant secondary to other inflammatory process[5]. The mechanism by which the acute inflammation causes thrombocytosis is not fully understood. Two humoral factors, thrombopoietin and megakaryocyte colony stimulating factor[6] appear to regulate the production and the numbers of circulating platelets. There is a wide variety of causes associated with thrombocytosis[2,3]. In our study, bacterial infection in particular pneumonia was the predominant cause of thrombocytosis. Other common conditions included urinary tract infection, gastroenteritis and Kawasaki's disease.

Secondary thrombocytosis is a benign and self-limiting condition. None of the cases developed any complications associated with the high platelet level. This could have accounted for the low proportion of followed-up platelet count especially when the child had recovered from the underlying illness. The onset of thrombocytosis occurred within the first week of illness in majority of the illness. The normalisation time depends on the severity of inflammation. Generally, the normalisation time is longer in bacterial infections compared to the viral infections.

In this study, patients with platelet level above twice the upper normal limit were associated with high possibility of bacterial infection. Kawasaki's disease was the other common condition associated with high platelet count. Such cases should be investigated to exclude possible underlying conditions.

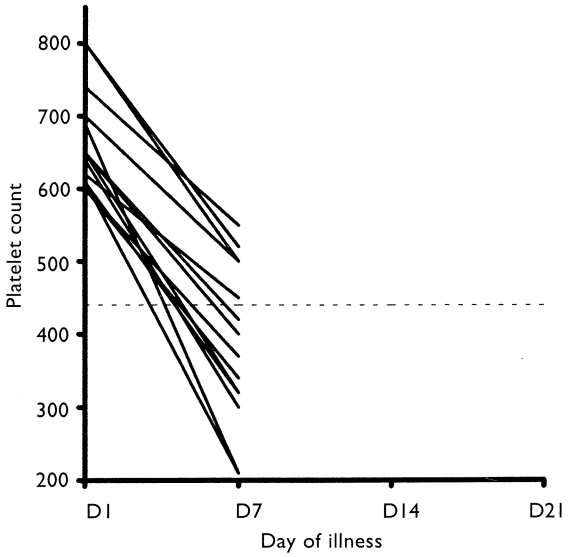

Fig 2 – Non-bacterial infection

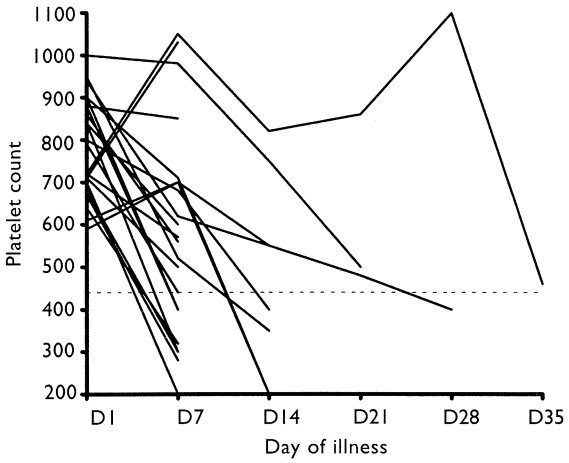

Fig 3 – Bacterial infection

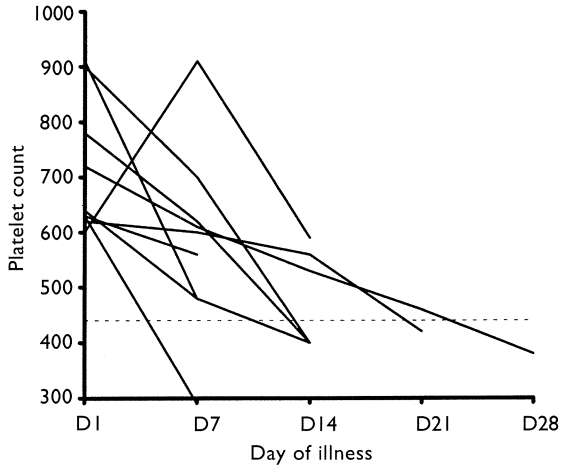

Fig 4 – Kawasaki's disease

ACKNOWLEDGEMENTS

The authors acknowledge the assistance of the staff at Tan Tock Seng Hospital's Haematology Laboratory for providing the patients' records for the purpose of this study.

REFERENCES

1. Chan KW, Kaikow Y, Wadsworth LD. Thrombocytosis in childhood: a survey of 94 patients. Paediatrics 1989; 84:1064-7.
2. Health HW, Person HA. Thrombocytosis in paediatric out-patients. J Paed 1989; 114:805-7.
3. Vora AJ, Lilleyman JS. Secondary thrombocytosis. Arch Dis Child 1993; 68:88-90.
4. Silverstein MN. Primary thrombocythemia. In: Williams NJ, Beutler E, Ersler AJ, Lichtman MA, eds. Haematology. 3rd ed. New York: McGraw-Hill, 1983:218-21.
5. Corrigan JJ Jr. Kawasaki disease and the plight of the platelet (Editorial). AJDC 1986; 40:1223-4.
6. Lipton JM, Nathan DG. The anatomy and physiology of hematopoiesis. Nathan DG, Oski FA, eds. Haematology of infancy and childhood. 3rd ed. Philadelphia: WB Saunders,1987:147-51.