# Asymtomatic essential thrombocythemia in a child: a rare case report

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## Abstract
Essential thrombocythemia is a rare myeloproliferative disorder in pediatrics. This myeloproliferative disorder is charactherized by thrombocytosis and hyperplasia of megakaryocytes in the bone marrow. Other cell lines are not involved.JAK2V617Fmutations has been identified in approximately half the patients with this disorder. We describe a 12-year-old boy with essential throbocythemia. The patient had a persistent thrombocytosis over 600x109 /L and the time of diagnosis, his platelet count ranged between 900x109and 2150x109/L. Megakaryocytes in the bone marrow were increased in number. The chromosomal analysis was normal and bcr/abl rearrangement was negative. He remained asymptomatic throughout the follow-up period.

**Keywords:** Thrombocythemia, Myeloproliferative disorder

Received: 12, Feb, 2013
Accepted: 2, Mar, 2013

## Introduction
Essential thrombocythemia (primary thrombocytosis) is rare in children occurring in approximately 1/1000,000 children[1-6]. ET is a myeloproliferative disorder characterized by thrombocytosis and hyperplasia of the megakaryocytes in the bone marrow[1, 2].Other cell lines are not involved[1]. Reactive (secondary) thrombocytosis is a more common cause of this elevated platelet count among children and the common causes of this entity such as infections, iron deficiency anemia, surgery, cancer, major trauma and post spelenectomy need to be excluded prior to considering the diagnosis ET[1, 2, 3]. ET is primarily a diagnosis of exclusion[2, 6, 8, 9] and is considered in the presence of a persistent thrombocytosis of greater than 600x109/L in the absence of alternative cause[2]. These patients may be predisposed to thrombosis or hemorrhage[3]. JAK2V617F mutation has been identified in approximately half the patients with this disorder[1, 2,4,7,9] .It occurs in more than 90% of patients with polycythemia vera and primary myeloproliferative disease[1, 2] and 30% of cases of ET[4, 7]. Familial thrombocythemia, a rare condition[6], is similar to ET but differs from ET in that the platelet count is usually significantly lower than ET associated with a lower incidence of hepatomegaly, and with fewer associated thrombotic complications [1,2,4,5,6] .No familial case converted to leukemia or myelofibrosis[1,2,6].

## Case Report
We describe a 10 years old male with an incidental finding of an elevated platelet count. This patient had been admitted due to upper respiratory tract infection. His post medical history was unremarkable with a normal birth history and was taking no medications. Immunizations status was up to date. The platelet count at the time of referral was 950x109/L. The physical examination was normal with the exception of mild splenomegaly (just palpable splenomegaly). He had lower leg pain but deep vein thrombosis ruled out with color dupler ultrasonography. His parent platelet count was normal and there was no family history of thrombocytosis. His white blood cell count and differential count were unremarkable, and platelet size was not enlarged. Hb, ESR and C-reactive protein were all within normal ranges. Bone marrow examination was normocellular with relatively normal numbers and maturation of erythroid and myeloid lineages but show clusters of large megakaryocytes with increased hyperlobulated nuclei (Fig-1). Myeloblasts are about 5% of all nucleated cells. Bone marrow biopsy show remarkable bony trabeculae and marrow spaces contain hematopoietic elements with

predominance of large hyperlobulated megakaryocytes. Reticulin staining was negative for myelofibrosis. The overall histological features suggest chronic myeloproliferative disorder without myelofibrosis suggestive of ET. Cytogentic showed normal 46, XY karyotype. No bcr/abl chimaeric transcript was demonstrated by reverse transcription polymerase chain reaction. JAK2-V617F mutation was negative. Evaluation of the MPL W515L/K gene was negative in the patient. He received low dose aspirin (80mg/day). Her platelet count ranging from 303x109 to2131x109 /L. He was admitted to hospital because of anxiety and right lower leg pain. At this time his platelet count was 2131x109/L and we started hydroxyurea 1000mg and anagrelide 2mg for him. The mean platelet count was 1029x109 /L. The platelet count has shown a trend of gradual fall over the past year and the latest platelet count was 580x109 /L. He is asymptomatic now.

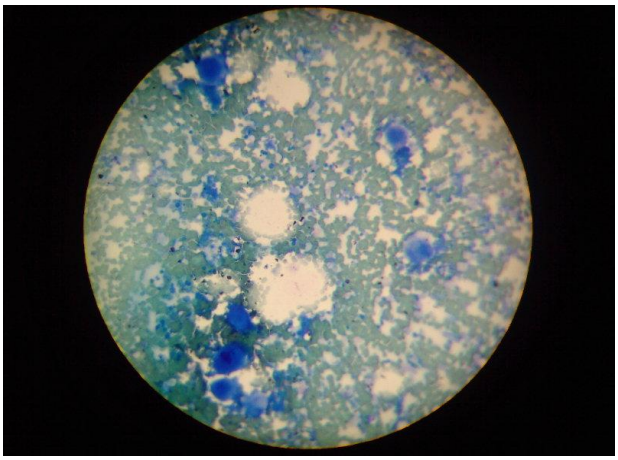

**Figure 1** Bone marrow aspiration showed megakaryocytic hyperplasia (magnification × 40).

## Discussion

Throbocytosis is relatively common in young children occurring in 3% to13% of children[5, 8]. Extreme thrombocytosis (platelet >1000,000) is uncommon, occurring in less than 2%of children[8]. Almost all reported case of throbocytosis in children are secondary to infection ,iron deficiency ,surgery, cancer, postsplenectomy ,chronic inflammation, collagen vascular and renal disease, langerhans cell histocytosis, hemolytic anemia ,Kawasaki disease drugs[1,2,3,4,8]. Essential thrombocythemia extremely rare in childhood[1-8],with an estimated incidence of 0.09 case per million for children younger than 14 years 60 times lower than in adults[4]. Based on the criteria of the PVSG approximately 75 children have been reported with essential thrombocythemia between 1966 and 2000[2]. Edwin B.Robins [4]desceibed a 2 years old male with an incidental finding of an elevated platelet count discovered on health maintenance screening. The platelet count at the time of referral was 900x109/L, and his physical examination was remarkable for bony abnormalities of the right upper extremity and hand. Maria Luigia Randi,et al [5]reported five children with essential thrombocythemia. Moreover only one case of them was infant[5].Abeer Abd EI-Moneim, et al also reported 12 cases of children with essential thrombocythemia[9]. Dror, et al from the Hospital for sick children in Toronto reviewed the clinical course of 36 children with ET[8]. Forty eight children with ET were described in the medical literature prior to 2006, with the age ranging from 6 weeks to 18 years[8]. ET in children is not always a benign entity[6], in adults with ET, thrombosis is the most common and hazardous complication, occurring in about 40% of patients[5]. In contrast, most children with ET seen to have few major thrombotic complication [5]. Out of the 42 children with ET revied by Dror [18] patients (42%) had ET-related symptoms[6]. Four children experienced severe bleeding episods, six children had mild hemorrhage, four children suffered from severe arterial thrombosis, and in two cases venous thrombosis were documented. Two children had headache, erythromelalgia and limb paresthesia. Splenomegaly was found in 44%, hepatomegaly in 22% of the patients [6]. Children with thrombocytosis may develop unspecific symptoms that are potentially related to thrombocytosis. The clinical course is heterogeneous[8, 9]. Some patients may recover spontaneously [9]. Due to the lower incidence of ET in children optimal first line therapy remains unclear in this age group[6]. Furthermore treatment of asymptomatic patients remains problematic[6] .Hydrxoyurea has been used successfully in patients with ET[4, 6,9,10]. Anagrelide has a high specificity toward megakaryocytes and effectively controls extreme thrombocytosis in adults and children[1, 2, 3, 4, 6]. The use of anagrelide to treat children with ET has been described since 19914 and long term use of anagrelide has been studied in

adults with a 93% response rate in a prospective cohort of 335 adults[4], and in children[4]. Indication for treatment included thrombotic events, major bleeding, minor bleeding, or merely high platelet counts[6]. Antiplatelet agents such as low-dose acetylsalicylic acid or dipyridamol have proved efficacious in preventing recurrence of thrombosis in the acral, coronary and cerebral arterial circulations in patients with ET, and have been recommended as initial therapy in patients with minor benign problems[6].

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