## LETTER TO THE EDITOR

# A four-point clinical criteria distinguishes immune thrombocytopenia from acute lymphoblastic leukaemia

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**SUMMARY**

**Immune thrombocytopenia is the most common diagnosis of isolated thrombocytopenia. The dilemma encountered by paediatricians is missing diagnosis of acute leukaemia in children with isolated thrombocytopenia. We demonstrated childhood ITP could be diagnosed using a four point clinical criteria without missing a diagnosis of acute leukaemia. Hence, bone marrow examination is not necessary in children with typical features compatible with ITP prior to steroid therapy. This can encourage paediatricians to choose steroid therapy, which is cheaper and non-blood product, as first line platelet elevating therapy in children with significant haemorrhage.**

**KEY WORDS:**
*ITP, steroid therapy, bone marrow examination*

Dear Editor,

The most common diagnosis of isolated thrombocytopenia in children is immune thrombocytopenia (ITP). Childhood ITP is a diagnosis by exclusion. In newly diagnosed patients with significant haemorrhage, immediate platelet elevating therapy (PET) is required. High-dose corticosteroid pulse is effective PET in newly diagnosed ITP. Reluctance in using corticosteroid PET stems from fear of potentially masking the diagnosis of acute lymphoblastic leukaemia (ALL). A further point is many physicians opt to perform bone marrow aspiration prior to intervention with steroids in children with ITP. As requirement for pre-steroid bone marrow studies is invasive and would delay treatment, intravenous immunoglobulin (IVIg) is often chosen instead. Although effective, IVIg is expensive and is blood-derived.

The aim of this study is to evaluate a four-point clinical criteria (4PCC) in diagnosing ITP, allowing safe use of corticosteroid as first line PET in haemorrhagic patients. The 4PCC for diagnosis of ITP (platelet <100×109/L) include:
(a) Impalpable liver and spleen
(b) Haemoglobin (Hb) level ≥100 g/L
(c) White blood cell count (WBC) 4-10×10$^9$/L
(d) No blasts in peripheral blood smear

Combined validity of these parameters in diagnosing ITP was cross evaluated by retrospective review of a patient cohort with newly-diagnosed ALL enrolled on the Malaysia-Singapore 2003 treatment protocol (2003-2010).

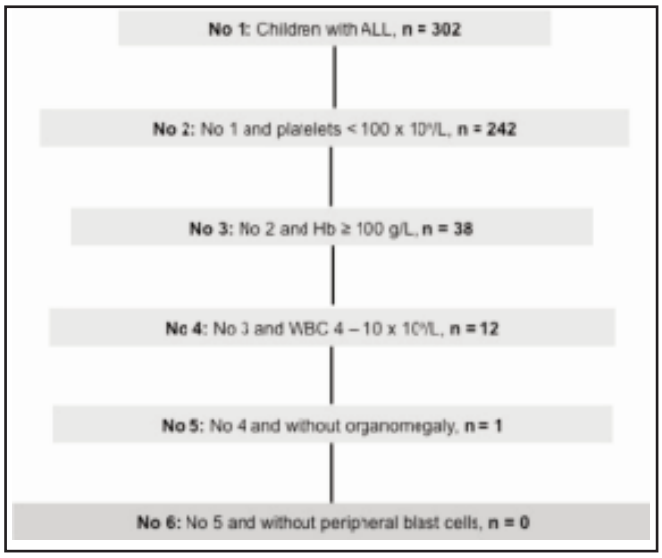


**Fig. 1:** The four-point clinical criteria (4PCC) was applied to a cohort of 302 newly diagnosed acute lymphoblastic leukaemia (ALL) patients. None of these 302 patients demonstrated all four clinical criteria.

Three hundred and two patients were enrolled in this review. The median age of diagnosis was 4.38 years (range 0.08 to 15 years). Of 302 patients with newly-diagnosed ALL, 242 (80.1%) had significant thrombocytopenia (platelet <100×10$^9$/L). Thirty-eight of these patients had normal Hb and12 had normal Hb and WBC. Only one ALL patient had normal Hb, WBC and no palpable hepatosplenomegaly but had circulating blasts. No patient with newly-diagnosed ALL demonstrated all four clinical parameters (Figure 1).

The anxiety over missing a diagnosis of acute leukaemia has prompted physicians to perform bone marrow aspiration in children with suspected ITP prior to steroid therapy. Hence, this retrospective cross-validation review supports the use of a 4PCC in the diagnosis of ITP. Where microscopy is a limitation, a 3-point criterion (normal Hb, WBC and impalpable liver-spleen) is still useful in diagnosing ITP, with an estimated 1 in 300 risk of missing an ALL diagnosis. An ALL study by the American Paediatric Oncology Group (POG) also supports our observation. Of 2239 patients diagnosed with ALL in the two POG protocol from 1978 to 1985, none demonstrated isolated thrombocytopenia without circulating blasts and/or hepatosplenomegaly.[1] Similarly, Calpin *et al.*

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showed that no diagnosis of leukaemia was made on bone marrow examination done for 332 children with typical haematological features of ITP.[2] Therefore, the diagnosis of childhood ITP can be confidently made using clinical criteria alone, thus, allowing the use of high dose steroid as first line PET. Nevertheless, prospective validation of 4PCC in diagnosing childhood ITP is required.

## REFERENCES

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