sysmex | Together for a better healthcare journey

Managing immune thrombocytopenia (ITP) treatment effectively

When determining a differential diagnosis for ITP, the immature platelet fraction (the percentage of immature platelets within the total platelet count), which can be determined alongside a CBC, has been shown as a good supportive indicator. However, when managing ITP or predicting a response to its treatment, the total platelet count and/or immature platelet fraction do not provide all the necessary information. This is because thrombocytopenia in ITP is caused by both impaired platelet production and accelerated platelet destruction. Fortunately, studies have shown that another parameter – the absolute count of immature platelets (IPF#) – can provide valuable information about a patient's response to treatment, notably which mechanism is the one proving effective, as well as assessing the bleeding risk.

Parameter	Value	Unit
PLT-F	35	10^9/ L
MPV	----	fL
IPF	11.4	%
IPF#	4.0	10^9/ L

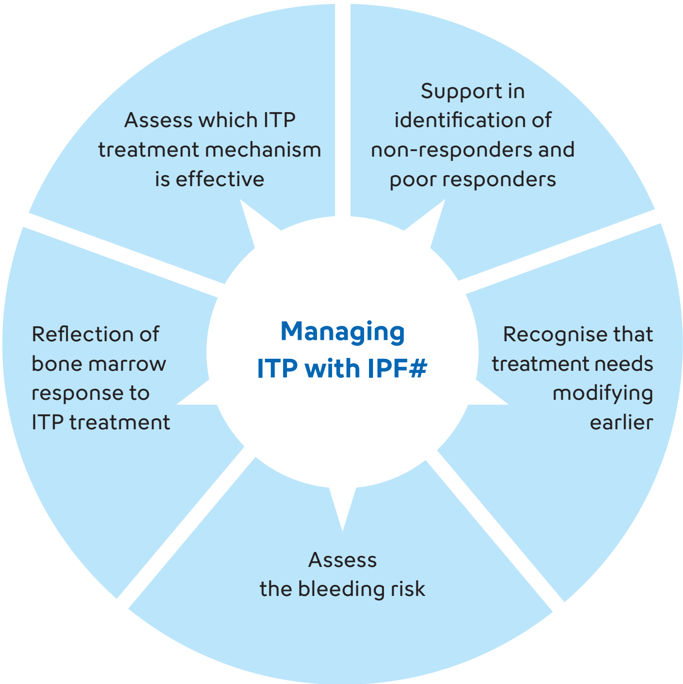
IMMATURE PLATELETS CLINICAL USE

Know more.
Decide with confidence.
Act faster.

A 43-year-old man with a diagnosis of chronic immune thrombocytopenia (ITP) and bleeding episodes is treated with intravenous immunoglobulins (IVIg). The complete blood count before medical intervention reveals a platelet count of 35 × 10^9/L and an immature platelet count (IPF#) of 4.0 × 10^9/L. The patient is infused with 1 g/kg IVIg and the PLT count increases to 157 × 10^9/L one week after the intervention, suggesting successful treatment. However, IPF# has not increased and is only 3.5 × 10^9/L, indicating that the increased PLT count is mediated by lowering the antibody-mediated platelet removal from the peripheral blood. The information about the absolute immature platelet count can provide earlier supportive insights about whether the ITP treatment mechanism is effective or not. For this particular patient, the low IPF# indicates ongoing impairment of bone marrow platelet production and adjusted therapy could result in long-term normalisation of PLT counts.

What is the immature platelet count, or IPF#?

- The absolute count of immature platelets, determined from a patient's peripheral blood sample and independently from the total platelet count.
- Immature or reticulated platelets are newly released from bone marrow reflecting its activity, and their high amount of RNA is measured by a specific fluorescence method.
- The platelet analogue of reticulocytes in red cell populations.
- Compared to the immature platelet fraction (IPF), the immature platelet count (IPF#) was found to be barely affected by platelet transfusions [1, 2].
- IPF# reference range: 3.1-18.7 × 10^9/L [3]
- IPF# is readily available from a routine laboratory analysis of an EDTA blood sample.



Managing ITP with IPF#

- The haematological parameter ‘immature platelet count’ (IPF#) reflects real-time effective bone marrow response to ITP treatment [4].
- The immature platelet count assesses the mechanism of ITP treatment, i. e. it answers whether an observed increase in platelet count is due to increased platelet production or the inhibition of antibody-mediated platelet destruction [4].
  - A high IPF# indicates an effective increase in bone marrow platelet production in response to treatment.
  - A low IPF# indicates ongoing impairment of bone marrow platelet production, so any platelet count increase would be due exclusively to a deceleration of antibody-mediated platelet destruction.
- Failure to increase the immature platelet count can identify non-responders and poor responders to thrombopoietic agents early on [5, 6].
- Information about the immature platelet count can improve treatment outcome because the need for treatment modification can be recognised earlier.
- Due to the higher reactivity and haemostatic potential of immature platelets, an increased immature platelet count is associated with a lower bleeding risk in severely thrombocytopenic patients [7].

Your benefits

- The diagnostic parameter IPF# is readily available from a routine laboratory blood test and may be ordered and processed together with the complete blood count.
- Effective and rapid support for risk assessment, response prediction and managing of ITP treatment can accelerate and improve treatment outcomes.
- Managing ITP treatment in this way can improve patient care and reduces costs.

Benefit from more background information in our freely accessible white papers: www.sysmex-europe.com/whitepapers

For references to independent publications, please visit www.sysmex-europe.com/academy/library/publications or contact your local Sysmex representative.

References

[1] **Have LWJ *et al.* (2013):** Absolute immature platelet count may predict imminent platelet recovery in thrombocytopenic children following chemotherapy. Pediatr Blood Cancer. 60(7): 1198–203.

[2] **Bat T *et al.* (2013):** Measurement of the absolute immature platelet number reflects marrow production and is not impacted by platelet transfusion. Transfusion. 53(6): 1201–4.

[3] **L van Pelt J *et al.* (2022):** Reference intervals for Sysmex XN hematological parameters as assessed in the Dutch Lifelines cohort. Clin Chem Lab Med. 60(6): 907–920.

[4] **Barsam SJ *et al.* (2011):** Platelet production and platelet destruction: assessing mechanisms of treatment effect in immune thrombocytopenia. Blood. 117(21): 5723–32.

[5] **Psaila B *et al.* (2012):** In vivo effects of eltrombopag on platelet function in ITP: no evidence of platelet activation. Blood. 119(17): 4066–72.

[6] **Bernlochner I *et al.* (2015):** Impact of immature platelets on platelet response to ticagrelor and prasugrel in patients with acute coronary syndrome. Eur Heart J. 36(45): 3202–10.

[7] **Greene LA *et al.* (2014):** Beyond the platelet count: immature platelet fraction and thromboelastometry correlate with bleeding in patients with immune thrombocytopenia. Br J Haematol. 166(4): 592–600.

ZE001505.EN.C.12/23

Sysmex Europe SE · www.sysmex-europe.com
You will find your local Sysmex representative’s address under www.sysmex-europe.com/contacts