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Immature platelet fraction measurement: a future guide to platelet transfusion requirement after haematopoietic stem cell transplantation

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Summary: The decision to prophylactically transfuse platelets is dependent on the platelet count, careful regular clinical assessment and agreed local protocol. The ability to predict when platelet recovery will occur should allow a more reasoned approach to platelet transfusion. An increase in reticulated platelets demonstrates impending platelet recovery. A new rapid automated method to assess reticulated platelets, the immature platelet fraction (IPF), is described, and its clinical utility assessed. The IPF is identified by flow cytometry with the use of a nucleic acid specific dye in the reticulocyte channel on the Sysmex XE-2100. Fifty healthy adult volunteers were used to establish the normal range. Patients where platelet marrow production or destruction might be abnormal were studied, and some patients followed serially during treatment. Thirty patients receiving cytotoxic chemotherapy were tested, and 13 of these patients followed serially. Fifteen patients post-autologous or allogeneic transplant were followed daily for platelet count and IPF percentage to monitor platelet recovery. The method demonstrates good reproducibility and stability. The recovery phase of thrombocytopenia in most chemotherapy and transplant patients was preceded by a rise in IPF percentage several days prior to platelet recovery. In particular, patients undergoing autologous transplantation (n = 8) using peripherally collected stem cells have a characteristic IPF percentage motif, with a rise one or two days prior to engraftment. The automated IPF is a useful parameter in the clinical evaluation of the thrombocytopenic patient and has the potential to allow optimal transfusion of platelet concentrates.

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