Checklist for the management of platelet refractoriness (PTR)

- [ ] Determine post-transfusion platelet increment (PPI) x 2 (at 10–60 mins)
  PPI = post-transfusion platelet count – pre-transfusion platelet count
  PPI < 10 x 10^9/L at 10–60 mins on 2 occasions = PTR
- [ ] Continue to transfuse ABO compatible platelets as required
- [ ] Investigate and treat non-immune causes
- [ ] Contact the Blood Service:
  - Collect samples for HLA (human leucocyte antigen) typing and antibody testing
  - Complete Request for HLA/HPA (human platelet antigen) compatible platelets – Clinical information form, available from: www.transfusion.com.au/resource_centre/forms

HLA antibodies detected

- [ ] Support with HLA compatible platelets* provided by Blood Service
- [ ] Monitor response – PPI at 1 hr and 24 hrs post transfusion

HLA antibodies not detected or poor response

- [ ] Continue with ABO compatible products
- [ ] Re-assess non-immune causes
- [ ] Contact the Blood Service to discuss further options

HPA antibodies detected

- [ ] Support with HLA and/or HPA compatible platelets* provided by Blood Service

**Note: the 'best' HLA selected platelets may be ABO-incompatible platelets*

Australian Red Cross BLOOD SERVICE

Australian governments fund the Australian Red Cross Blood Service to provide blood, blood products and services to the Australian community.

Definition of platelet refractoriness (PTR)

The repeated failure to achieve satisfactory responses to platelet transfusions from random donors.

Adverse outcomes associated with PTR

- Longer hospital stays
- Increased risk of bleeding
- Decreased survival
- Higher inpatient hospital costs

Non-immune causes (> 80% of cases)

- Sepsis
- Fever
- Disseminated intravascular coagulation (DIC)
- Splenomegaly
- Active bleeding
- Medications e.g. vancomycin, amphotericin B, heparin
- Graft versus–host disease (GVHD)
- Veno-occlusive disease (VOD)

Immune causes (< 20% of cases)

- Prior exposure from pregnancy, transfusions and/or transplantation
    - o Alloimmunisation to HLA antigens (80–90%)
    - o Alloimmunisation to HPA antigens (10–20%)
    - o Alloimmunisation to HLA and HPA antigens (5%)
- Other antibodies: drug dependent, ABO or autoantibodies

Indications for supply of HLA compatible platelets

- Patients who are refractory to random platelet transfusions due to the presence of HLA alloimmunisation.
- Patients with congenital platelet function disorders such as Bernard–Soulier syndrome, Glanzmann Thrombasthenia or other congenital platelet disorders where development of HLA alloantibodies may make future platelet support very difficult.
- Patients who are to undergo stem cell transplantation (sibling/unrelated) using stem cells from a donor who is not a full HLA match and where development of HLA antibodies could result in an adverse transplantation outcome.

Indications for supply of HPA compatible platelets

- Patients with thrombocytopenia due to HPA alloimmunisation i.e. neonates with fetomaternal or neonatal alloimmune thrombocytopaenia (FNAIT).
- Patients who are refractory to random platelet transfusions due to the presence of HPA alloimmunisation.

References

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