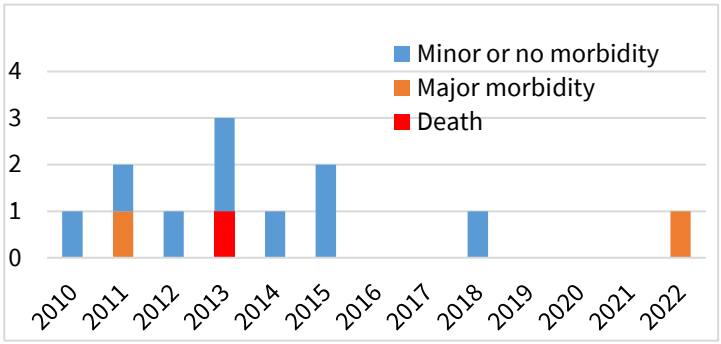
SHOT Bite No. 30
Post-Transfusion Purpura

SHOT Serious Hazards of Transfusion

Post-transfusion purpura (PTP) is an extremely rare transfusion reaction. It is defined as thrombocytopenia arising 5-12 days following transfusion of cellular blood components (red cells or platelets) associated with the presence of antibodies in the patient directed against the human platelet antigen (HPA) systems

- PTP occurs primarily in individuals sensitised to platelet antigens by exposure during pregnancy or transfusion; and has predominantly been reported in females
- Red cells are most commonly implicated, but PTP can be seen with transfusion of any platelet-containing blood components, including RBC, platelets, fresh (but not frozen) plasma, or granulocytes
- Since the introduction of universal leucodepletion in the UK in Nov 1999, the number of PTP cases reported to SHOT have decreased significantly

PTP cases reported to SHOT 2010-2022 (n=12)



SHOT Serious Hazards of Transfusion

Illustrative case

A middle aged multiparous woman with no history of neonatal alloimmune thrombocytopenia (NAIT) received 2 units of red cells (RBC) following blood loss during a mastectomy. Her platelet (PLT) count before surgery was $161x10^9$/L.

12 days after transfusion…

When the patient was reviewed as part of routine check-up in an outpatient clinic, she was found to have a PLT count of only $3x10^9$/L. She reported purpura and bruising.

The patient was treated with intravenous immunoglobulin (IVIg). Her PLT count recovered to $100x10^9$/L nine days later.

This patient had HPA-1A alloantibodies and her genotype was HPA-1b1b.

Pathogenesis of PTP

PTP can be thought of as a delayed transfusion reaction involving platelets, in which an anamnestic response to a previously encountered foreign platelet antigen leads to an increase in production of anti-platelet antibodies by the recipient. The antigen most commonly implicated is HPA-1a. Unlike a delayed haemolytic reaction, however, these antibodies cause destruction of both the HPA-1a transfused platelets as well as bystander destruction of the patient's own platelets, leading to thrombocytopenia.

Patient previously sensitised to platelet antigens

Transfusion

Re-sensitised to the same antigens and produce **potent platelet-reactive antibodies**

Platelet destruction

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How to recognise PTP

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- More common in females
- Important to note previous pregnancy

Transfusion RBC +/- PLT

5-12days post transfusion

Acute onset severe low PLT count

- More frequent symptoms include bruising/minor bleeding
- Patient may occasionally present with major haemorrhage
- The low platelet counts can last for days or weeks

First line treatment: IVIg
→ Quick response

Anti-HPA investigation

Key messages and recommendations

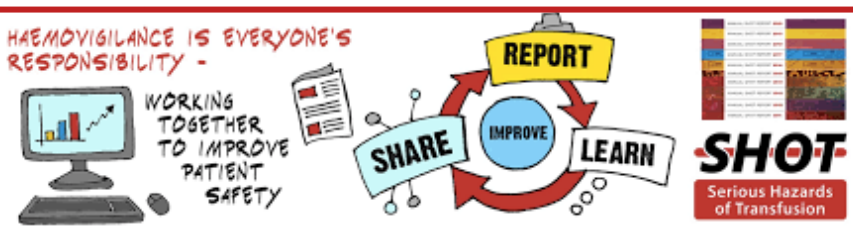
- **Suspect PTP** in any patient developing severe thrombocytopenia and a history of recent transfusion (RBC or/and PLT); investigate appropriately. Patients with PTP can present with severe thrombocytopenia (with platelet counts ≤20,000/microL), which is sufficient to cause purpura, petechiae, and clinically significant bleeding
- In this context, **IVIg** should be administered promptly to patients developing bleeding symptoms. Intracranial haemorrage can be fatal. Increase in platelet counts can be seen ~ 4days post treatment with IVIg. High-dose glucocorticoids and exchange transfusion have been useful in some patients with PTP; however, both these treatments take two or more weeks to act and can result in side effects
- **All cases of PTP should be reported to SHOT** https://www.shotuk.org/reporting/
- Patients with previous PTP should ideally receive **HPA-compatible blood components**
- ***Staff and patient education is vital to improve awareness, allow timely diagnosis and appropriate management***

Differential diagnosis: This includes other immunologically mediated forms of thrombocytopenia, including immune thrombocytopenia (ITP), acquired autoimmune thrombotic thrombocytopenic purpura (TTP), and drug-induced thrombocytopenia. Unlike PTP, these other thrombocytopenias rarely have a temporal relationship to a transfusion. If thrombocytopaenia is unresponsive to platelet transfusion, seek haematology advice and initiate appropriate investigations

Under-recognition and under-reporting: The actual incidence of PTP is difficult to estimate as this is under-recognised and under-reported. Staff need to be aware of this possible delayed transfusion complication and consider the diagnosis in appropriate clinical situations

Detection of allo-antibodies: PTP may be suspected even in the absence of detectable allo-antibodies, if the clinical course is typical and development of antibodies is plausible according to the HPA genotype

Useful resources: Hawkins J, et al. *Post transfusion purpura. Current perspectives,* J Blood Med 2019. doi: 10.2147/JBM.S189176



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