Title:

The Investigation and Transfusion Support of Patients with, or at risk of, Post Transfusion Purpura

INTRODUCTION

This policy outlines the current approach used in Scotland to provide transfusion support to patients during the acute phase of Post Transfusion Purpura (PTP). It also outlines the transfusion support required for patients with a past history of PTP or the mothers of children affected by Neonatal Alloimmune Thrombocytopenia (NAIT).

BACKGROUND

PTP is a rare but serious complication of blood transfusion. It is defined as a thrombocytopenia arising within five to twelve days of receiving cellular blood components (i.e. red cells or platelets) associated with the presence in the patient of antibodies directed against the human platelet antigen (HPA) systems. Within the UK PTP currently occurs in approximately 1 in 700,000 transfusions. PTP has become increasingly rare since the advent of universal leucodepletion as many white cell filters will remove platelets and platelet remnants from red cell concentrates.

PTP has usually been described in parous women, although it can also occur in male or female patients who have previously been transfused.

It is proposed that transfusion triggers an anamnestic (secondary immune) response in patients previously sensitised to HPA antigens. The HPA antibodies then cause antibody mediated destruction of both donor platelets and the patient's own platelets. The most commonly implicated platelet antibody responsible for PTP is anti-HPA-1a. There have also been case reports of patients who have developed PTP with a variety of other HPA specificities including HPA-1b, HPA-3a, HPA-3b, HPA-4a, HPA-5a, HPA-5b and HPA-15.

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INDICATIONS FOR INVESTIGATION

The possibility of PTP should be considered when a patient develops unexplained thrombocytopenia within 2 weeks of receiving a cellular blood component.

The differential diagnoses that may also need to be considered include:

a. Heparin Induced Thrombocytopenia.
b. A thrombocytopenia caused by the passive transfusion of HPA antibodies. (A significant reduction in the patient's platelet count can occur within 48 hours of transfusion of FFP or other plasma containing blood components because of the presence of a platelet specific alloantibody in the donor's plasma)

CONFIRMATION OF PTP

The diagnosis of PTP is confirmed by demonstrating the presence of an IgG anti-HPA alloantibody in the patient's serum using appropriate HPA antibody assays. The patient's HPA genotype (HPA-1,2,3,5 and 15) should also be determined by PCR-based testing methods.

HLA antibodies do not cause PTP. They may however also be found in the patients serum.

For the laboratory diagnosis of a possible case of PTP, 3 x 6ml clotted samples and a 6ml EDTA sample should be sent to the local SNBTS H&I laboratory for initial investigation by ELISA and PCR typing. Testing to confirm results will also be undertaken in the Molecular Immunohaematology Dept of the Aberdeen centre. The case should be discussed with either the SNBTS Consultant Clinical Scientist in H&I or an SNBTS Consultant in Transfusion Medicine (or Local Consultant Haematologist) before sending a sample.

The ELISA and PCR typing tests are performed during normal working hours Monday to Friday only, with an expected turn-around time of 1 day. Confirmatory MAIPA testing in Aberdeen may take 1-2 weeks.

MANAGEMENT OF PTP

Appropriate treatment should be started as soon as a clinical diagnosis of PTP is made without waiting for the results of laboratory tests.

The treatment of choice is high dose intravenous immunoglobulin (ivIg), 2g/kg body weight administered in divided doses over 2-5 days. About 85% of patients respond to this treatment. The platelet count should be closely monitored during the recovery phase until normal levels are reached because of the possibility of developing a rebound thrombocytosis

Plasma exchange and steroids have been used in the past, but an increase in platelet count

is significantly delayed compared to ivIg. Plasma exchange should be considered if the patient is refractory to ivIg therapy.

TRANSFUSION SUPPORT

a. **In the acute phase of PTP**

If severe bleeding occurs before the effects of ivIg are seen, random ABO RhD compatible components can be given. Multiple doses of platelets may be required to treat significant haemorrhage.

There is NO evidence that transfusing HPA selected red cells or platelets reduces the time of severe thrombocytopenia during the acute phase.

b. **After Recovery**

All future elective transfusions of red cells and platelets should where possible be from donors who are NEGATIVE for the relevant HPA antigen (i.e. HPA selected donations).

If HPA matched red cells are not available, washed Red Cells have been proposed as a means to further reduce platelet contamination. However there is little evidence to support this and the decision must be approved by appropriate SNBTS medical staff.

Standard ABO and RhD compatible blood components, unselected for HPA should be administered if the risk of delaying the transfusion outweighs the risk of a recurrence of the PTP.

The platelet count should be monitored closely following the transfusion

c. **Prevention of PTP in patients with HPA-specific alloantibodies but with no previous history of PTP**

The risk of PTP developing in mothers who have had a child with Neonatal Alloimmune Thrombocytopenia has been significantly reduced by the introduction of leucodepletion. Despite this future elective transfusions of red cells and platelets should also, where possible, be from donors who are NEGATIVE for the relevant HPA antigen (i.e. HPA selected donations). If these are not available the use of Plasma Reduced Red Components may be considered.

Standard ABO and RhD compatible blood components, unselected for HPA should be administered if the risk of delaying the transfusion outweighs the risk of PTP.

REQUESTING HPA SELECTED OR PLASMA- REDUCED COMPONENTS

These components are only available on an elective/semi-elective basis.

All initial requests for such components must be authorised by SNBTS medical staff.

REPORTING TO MHRA AND SERIOUS HAZARDS OF TRANSFUSION

PTP is one of the most serious non-infectious adverse reactions of transfusion and must be reported to both the MHRA and the SHOT scheme.

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