Adverse reactions to blood components

Blood Transfusion Guideline

Purpose

This guideline describes the different reactions that recipients may experience during or following a transfusion of a blood component along with the initial actions that clinical teams should take in response.

Adverse reactions to blood components

For a quick guide to recognition and management of acute transfusion reactions please also refer to the Handbook of Transfusion Medicine (5th Edition) Flowchart for the Management of Acute Transfusion Reactions (Figure 5.1 page 46) found at http://www.transfusionguidelines.org.uk/transfusion-handbook/5-adverse-effects-of-transfusion/5-2-non-infectious-hazards-of-transfusion

Hospital Transfusion Teams on each acute hospital site and the NHS Lothian Transfusion Committee will review all severe reactions.

Any adverse event experienced by a patient in association with a transfusion should be considered a possible transfusion reaction. The most commonly observed reactions are:

- volume overload (dyspnoea, hypoxaemia, hypertension and tachycardia)
- simple (non-haemolytic) febrile or allergic type reactions (rise in temperature, rash, itch, rigors)

Rarely, reactions are severe such as anaphylaxis, haemolysis or septic shock.

When a transfusion reaction is suspected the transfusion should be stopped and the doctor notified. Following medical review, if discontinuation of the transfusion is necessary, the implicated component should be returned to the transfusion laboratory and the haematology registrar on-call notified (please see detailed advice below).

The first 15 minutes of a transfusion are the most critical as only a small volume of incompatible blood may cause a reaction.

It is important that any transfusion reaction is reported appropriately: please see Blood Transfusion Procedure: Reporting adverse events and reactions.

Acute haemolytic transfusion reactions and septic reactions

These can develop after as little as 5-10 mL of blood have been transfused so observe the patient closely at the start of the transfusion of each unit. Special care must be taken with patients who are unable to complain of symptoms that would raise suspicion of a developing transfusion reaction; in these cases, the only signs of a reaction may be bleeding, BP changes, tachypnoea or tachycardia.

Symptoms may be – apprehension, agitation, flushing, pain at venepuncture site and pain in chest, flank or abdomen.

Signs include – fever, hypotension, microvascular ooze, haemoglobinuria, tachycardia.

- **Stop transfusion**
- Inform medical staff immediately and commence appropriate resuscitation procedures
- Recheck patient and component compatibility
- Disconnect and take down blood component and blood administration set
- Commence IV crystalloid infusion using new administration set
- If patient has a significant fever (>2°C above baseline) take blood cultures, consider antibiotics and report immediately to the transfusion laboratory so that the blood services can be contacted if required to ensure that any other components from the same donation can be withdrawn from the supply chain. The decision on whether to recall components will need to be made by the haematology registrar on-call
- For further advice consult the on-call haematologist
- Inform transfusion laboratory and return blood component pack still attached to the administration set (with rollerclamp closed, sealed in two plastic bags). Also return all previously transfused empty packs. Hospitals outwith the RIE, WGH and St John's should request advice from the supplying transfusion laboratory, regarding the appropriate method of transportation for returned components
- Send a fresh sample of the patient's blood (adults and children more than 10 kg: 10 mL in blue topped Monovette EDTA tubes, children less than 10 kg: at least 2-4.5 mL in a blue topped 4.5 ml Monovette EDTA tube) and any other samples as advised by haematology staff
- The transfusion must not be recommenced
- Complete transfusion reaction form and return to the transfusion laboratory (form can be obtained from the transfusion laboratory)
- Document details of reaction in the patient's healthcare record and on Datix (choose 'transfusion' from drop-down menu)

Anaphylaxis

Features are acute collapse, hypotension and dyspnoea. It is usually caused by a reaction to a plasma protein and most commonly occurs with the administration of fresh frozen plasma or platelets.

- **Treatment is urgent – stop the transfusion**
- Inform medical staff immediately and commence resuscitation
- Disconnect and take down blood component and blood administration set
- Give oxygen, I.M. adrenaline, nebulised salbutamol, I.V. antihistamine and other measures to maintain BP (please see NHS Lothian Administration of Adrenaline (I.M.) in Life Threatening Anaphylaxis policy)
- Inform transfusion laboratory and send appropriate patient samples. Send serial samples to immunology for measurement of serial mast cell tryptase (plain tube) (immediate, 3 hours and 24 hours)
- The transfusion must not be recommenced
- Complete transfusion reaction form and return to the transfusion laboratory (form can be obtained from the transfusion laboratory)
- Document details of reaction in patient's healthcare record and on Datix (choose 'transfusion' from drop-down menu)

Transfusion related acute lung injury (TRALI)

This rare but life-threatening complication usually develops within 2 hours of transfusion (maximum 6 hours) and is caused by antibodies in donor plasma (usually from multiparous women). Symptoms and signs are acute respiratory distress with cough, dyspnoea, pink frothy sputum, fever, hypotension and typical x-ray appearance (bilateral nodular shadowing).

- **Stop transfusion**
- If suspected, contact on-call haematologist for advice
- Management is to maintain the patient's airway and treat as ARDS
- Diuretics should be avoided. Steroids are of uncertain benefit
- Document details of reaction in patient's healthcare record and on Datix (choose 'transfusion' from drop-down menu)

Transfusion Associated Circulatory Overload (TACO) i.e. fluid overload during transfusion

When too much fluid is transfused or the transfusion is too rapid, acute LVF may occur with dyspnoea, tachypnoea, non-productive cough, raised JVP, basal lung crackles, frothy pink sputum, hypertension and tachycardia.

- **Stop the transfusion**
- Sit patient upright
- Administer high concentration oxygen (at least 60%). Consider CPAP
- Monitor oxygen saturation
- For adults, administer furosemide 20 – 40 mg by slow IV injection for those not already taking a diuretic; 50 – 100 mg if already receiving a diuretic (max injection rate 4 mg/min). For children, administer furosemide 1 mg/kg by slow IV injection
- Document details of reaction in patient's healthcare record and on Datix (choose 'transfusion' from drop-down menu)

If saturations remain < 90% despite the above measures seek anaesthetic opinion. Intravenous nitrates e.g. nitroglycerine may be considered to promote venodilatation but an arterial line should be inserted prior to their use.

Non-haemolytic febrile transfusion reactions and allergic reactions

- **Stop the transfusion**
- Inform medical staff
- Recheck patient and component compatibility
- Commence appropriate treatment:
    - Shivering and fever 30 – 120 minutes after the start of a transfusion affect 1-2% of recipients, mainly multi-transfused or previously pregnant patients. These reactions are probably less frequent with leucodepleted components. These can usually be managed by giving an antipyretic e.g. paracetamol
    - Urticaria and itch starting within minutes usually subside with antihistamine treatment (e.g. chlorphenamine 10 mg IV for adults; chlorphenamine maleate as per British National Formulary (BNF) for children)
- Monitor patient closely for 30 minutes:
    - If signs and symptoms respond to treatment, transfusion may be recommenced. It may be appropriate to recommence at a slower rate. The patient must continue to be monitored closely and the transfusion discontinued if signs / symptoms return

  - If there is no improvement within 30 minutes, or if any deterioration occurs, do not re-start transfusion and treat as a severe reaction (see treatment of acute haemolytic and septic reactions)

- Document details of reaction in patient's healthcare record and on Datix (choose 'transfusion' from drop-down menu)
- Such symptoms could be the first indication of a more serious reaction so it is important to continue to monitor the patient closely
- Prophylactic pre-medication of regular transfusion recipients with an antipyretic and antihistamine may be considered