

Acute Transfusion Reactions (ATR) refers to any reactions occurring in the first 24 hours after transfusion. These are largely febrile, allergic or hypotensive reactions (FAHR), and are relatively common compared to other adverse reactions to transfusion. They can present with one or more of the following features:

- fever, rigors
- symptoms and signs of allergy (breathing and/or circulatory problems, rash and/or mucous membrane involvement)
- hypotension or shock
- pain

Other possible important causes of the clinical features, other than FAHR should be considered. The possibility that new symptoms and signs may be due to the patient's underlying condition should also be kept in mind. Other acute transfusion reactions include:

- **Acute haemolytic transfusion reaction.** Symptoms are usually immediate and include pain around the IV site, loin, chest, abdomen or back. There may be shock and/or severe rigors
- **Bacterial contamination of the unit** This rare eventually presents immediately or during the transfusion, often with shock and rigors
- **Transfusion-Associated Circulatory Overload (TACO)** This is a common complication characterised by features of respiratory distress that improve with treatment of circulatory overload
- **Transfusion-Related Acute Lung Injury (TRALI)** This is defined as acute dyspnoea with hypoxia with bilateral pulmonary infiltrates occurring during or within 6 hours of transfusion.

Immediate management of Febrile, Allergic and Hypotensive Reactions

Anaphylaxis

- This is characterised by acute circulatory and/or respiratory collapse, usually accompanied by a skin rash and/or mucous membrane involvement such as swelling of the lips, throat or conjunctivae.
- Management consists of immediate **resuscitation**, calling for skilled help, and the administration of **adrenaline**, 0.5mL of 1:1000 (500 micrograms) adrenaline intramuscularly (IM) for an adult or child aged >12, 0.3mL (300 micrograms) for a child aged 6-12, and 0.15mL (150 micrograms) for a child aged <6. Whilst adrenaline is the first line drug, there is some evidence that hydrocortisone may shorten an anaphylactic reaction. The evidence for chlorphenamine is weak

Dyspnoea not associated with anaphylaxis

SHOT data show that dyspnoea not associated with a rash or anaphylactic features is more likely to be related to TACO, or to the patient's underlying disease. Immediate investigations include urgent chest X Ray and measurement of oxygen saturation.

Severe febrile reaction

- If shock or severe rigors occur during or shortly after a transfusion, ABO incompatibility should be ruled out by checking the **identity** of the patient against the intended identity on the unit, and checking the blood component for any obvious **contamination**
- Management consists of immediate **resuscitation** and stopping the transfusion but maintaining venous access with IV saline. The unit should be retained in case further investigation is indicated. Blood cultures should be taken from the patient
- If the reaction is severe and sustained after stopping the transfusion –
 - broad-spectrum antibiotics should be initiated and the unit cultured. The **blood service** must be contacted, to discuss the need for **recall** of any other components from this donation
 - ABO and D group testing, antibody screen, DAT and crossmatch, should be performed on the initial transfusion sample, and a repeat sample taken at the time of the reaction

Severe hypotensive reaction

These are rare. It is important to determine whether hypotension is due to the component, in which case the transfusion must be stopped, or to bleeding, in which case it is important to continue the transfusion.

Less severe reactions

Febrile symptoms may resolve on stopping or slowing the transfusion, although paracetamol 500-1000mg (for an adult), administered orally, may also be of help. Mild allergic symptoms such as pruritus may also improve on stopping or slowing the transfusion. Rashes may respond to topical antihistamine cream. An oral antihistamine may also be beneficial.

Further Investigations and future transfusions

Further investigations In most cases, investigations will not demonstrate a cause for the reaction. However, most authorities recommend measurement of immunoglobulin A (IgA) levels in severe or moderate allergic reactions, as deficiency will have a bearing on the future choice of blood components

Management of future transfusions The majority of patients who have experienced a single allergic or febrile reaction will not experience repeat reactions. However, patients who experience repeated allergic reactions may benefit from washed red cells or platelets and provision should be discussed with a Blood Service consultant. Patients who are IgA deficient *and* have a history of reactions (rare) should also be transfused with washed red cells and/or washed platelets. IgA deficient plasma is also available if needed. There is no published evidence to support prophylaxis with antihistamine and prophylaxis with hydrocortisone is not evidence-based and is not recommended.

Allergy assessment There is evidence that patients who have experienced anaphylactic transfusion reactions have a higher incidence of other allergic reactions. Referral to an allergist should be considered. Patients should be encouraged to report any new features.

Reporting of FAHR and other acute reactions

Severe and moderate acute reactions must be reported to **SHOT** and **MHRA**, through the **SABRE** reporting system. Reporting of serious adverse reactions fulfills a regulatory requirement, as well as highlighting emerging trends in adverse events which may be associated with particular components

Reports should contain as much information as possible, e.g.

- Underlying condition of the patient
- temperature rise / other symptoms
- in the case of 'hypotension', please report blood pressure prior to the transfusion and during the reaction
- details of the blood component type associated with the reaction: e.g., 'washed red cells'

Key Points

- **Transfusions should only be carried out where patients can be observed and where there is access to skilled help if reactions occur**
- **When a reaction occurs, STOP the transfusion, maintain venous access with IV saline, and check Airway, Breathing, Circulation**
- **Check the Patient and Unit ID, and retain the unit for investigation**
- **While FAHR are relatively common, and rarely cause death or major morbidity, the possibility that symptoms and signs could be due to a different, potentially fatal cause, should be considered**
- **An anaphylactic reaction is a life-threatening event. The treatment of choice is intramuscular adrenaline**
- **When a patient experiences a severe reaction, the Blood Service must be contacted in case a recall of any other components from the donation is indicated**