6 Acute Transfusion Reactions

Definition

Acute transfusion reactions are defined in this report as those occurring at any time up to 24 hours following a transfusion of blood or components, excluding cases of acute reactions due to incorrect component being transfused as these are covered in Section 4

Forty-seven completed questionnaires were submitted for analysis. Eleven febrile non-haemolytic reactions and 1 drug reaction were withdrawn by the analyst and 1 report was transferred to the TRALI section.

This section describes the main findings from 34 completed questionnaires.

Patients

14 males and 20 females.
Ages ranged from 5 months to 87 years.
3 reports related to patients under 18 years and 1 to an infant under 12 months.

Outcomes and imputability

1 patient died following an acute unclassifiable reaction to red cells; imputability 1 (possibly related).
1 patient died following platelet transfusion, probably from acute pulmonary oedema; imputability 2 (probably related).
1 patient had an acute anaphylactic reaction causing major morbidity (respiratory arrest requiring ventilation) following FFP; imputability 3 (certain beyond reasonable doubt).

Table 9

Components implicated and types of reaction (n=34)

Reaction type	Red Cells	FFP	Platelets	Red cells, FFP and platelets	Totals
Acute haemolytic	4	0	0		4
Anaphylactic*	0	5 (1 MB-FFP)	3	1	9
Allergic**	6	9	3		18
Hypocalcaemia	0	1 (MB-FFP)	0		1
Probable acute pulmonary oedema			1		1
Unclassifiable	1	0	0		1
Total	11	15	7 ***	1	34
Incidence of reports per 100,000 components issued	0.4	4.0	5.8		1.0

* anaphylactic/anaphylactoid is defined as hypotension with one or more of: rash, dyspnoea, angioedema

** allergic is defined as one or more of: rash, dyspnoea, angioedema **without** hypotension

*** 5 were from buffy coat pools, 2 apheresis

Time relationship to transfusion

23 reactions occurred during the transfusion and 11 within 2 hours of completion.

Acute Haemolytic Reactions (n=4)

In every case, a reference laboratory was involved, either in providing antigen matched units or in the subsequent investigation of the reaction.

All patients had a negative pre-transfusion antibody screen. Antibodies reported on post-transfusion testing by reference laboratories were: an anti-Le^a active at ambient temperature, an anti-E detectable only by enzyme technique, an anti-Jk^a detectable by enzyme IAT, (not identifiable until 5 days post transfusion), and an IgM pan-agglutinin reacting at temperatures up to 30^{o}C

Anaphylactic Reactions (n=9)

Six patients were investigated for IgA deficiency, with negative findings. Two patients receiving platelets were also investigated for HLA and platelet specific antibodies, with negative findings.

Mast cell tryptase, which is typically transiently raised in severe allergic reactions, was requested in one patient and was found to be elevated.

One patient with TTP developed a rash and dyspnoea during plasma exchange with standard FFP but subsequent exchanges were uneventful using solvent-detergent treated plasma. The hospital now routinely uses solvent-detergent treated plasma for plasma exchanges (in line with current recommendations from MSBT).

One patient of 18 years had convulsions whilst hypotensive.

A 10 year old girl had experienced a mild allergic reaction during the previous two platelet transfusions but had not been given any pre-medication for the transfusion episode in question, following which she became dyspnoeic and hypotensive. The hospital now pre-medicates patients receiving platelets if they have suffered from a previous allergic reaction.

There were no instances of inappropriate FFP transfusions in this group.

One reaction involved MB-FFP.

Allergic reactions (n=18)

Five patients were investigated for IgA deficiency with negative findings. HLA antibodies were found in one of the 2 platelet recipients investigated.

Two patients received FFP outwith BCSH recommendations.

Deaths associated with transfusion

Case 1

An 87 year old male with multiple myeloma requiring regular red cell support developed rigors, hypotension and neck pain following transfusion of 100ml red cells. He died despite active resuscitation measures.

The unit was confirmed to be ABO identical and pre- and post-transfusion antibody screens were negative. A post mortem examination gave the cause of death as acute coronary insufficiency.

No bacterial cultures of the patient or unit were performed, hence bacterial contamination cannot be excluded.

Case 2

A 62 year old female with disseminated ovarian carcinoma, ischaemic heart disease and thrombocytopenia was transfused with 1 ATD of pooled buffy coat platelets prior to the reinsertion of a nephrostomy tube. Within 2 hours of completing the transfusion she became flushed, hypertensive and started coughing up "pink frothy sputum". She died before any attempts could be made to resuscitate her.

A tentative diagnosis of massive pulmonary embolus was made and the family declined a post mortem. However the clinical findings of a raised blood pressure and the nature of the sputum would favour acute pulmonary oedema.

Hypocalcaemia following MB-FFP transfusion

Case 3

A 5 month old female with pulmonary atresia underwent a Blalock-Taussig shunt operation and received MB treated FFP post-operatively to correct a prolonged prothrombin time. After 100ml plasma had been transfused the infant developed hypotension and bradycardia and was found to have a low ionised calcium of 0.31mmol/l. She made a rapid recovery following intravenous calcium, sodium bicarbonate and adrenaline.

Clinical management and case review

Most patients were seen promptly by a doctor and a Consultant Haematologist was also consulted.

Table 10

Time interval between reaction and medical examination

Time before seen by a doctor	Patients
< 15 minutes	21
< 30 minutes	7
< 60 minutes	2
Unknown	4
Total	34
Haematologist involved	22
Case review	
Reported to HTC	27
Reported to hospital laboratory	31
Reported to blood centre	17

COMMENTARY

- All cases of haemolytic transfusion reactions were referred to their local reference laboratory, in contrast with previous years.
- All reports of anaphylactic reactions were due to FFP or platelets. Although an increased proportion of patients with these reactions is investigated, there is no consistency of approach and a guideline is still awaited for the investigation of ATR.
- The two deaths occurring within hours of transfusion were not attributed to the transfusion by the reporters. However whilst the patients' underlying disease certainly contributed, their transfusions cannot be discounted as contributory factors.

RECOMMENDATIONS

- In the continued absence of a published national guideline for investigation ATRs, SHOT is developing, in collaboration with the BCSH Transfusion Taskforce, a minimum standard for investigation. This will be included in the Toolkit on the SHOT website.

  Action: SHOT, BCSH TTF, HTTs investigating ATRs

- In the event of a patient death during or immediately following blood transfusion, the possibility of an ATR must be considered and investigated.

  Action: HTCs for inclusion in transfusion policies