20 Uncommon Complications of Transfusion (UCT) n=24

Authors: Caryn Hughes and Shruthi Narayan

Definition:

Pathological reaction or adverse effect in temporal association with transfusion which cannot be attributed to already defined side effects and with no risk factor other than transfusion and do not fit under any of the other reportable categories, including cases of transfusion-associated hyperkalaemia.

Abbreviations used in this chapter

BSH	British Society for Haematology	**ODP**	Operating department practitioner
Hb	Haemoglobin	**SpO2**	Oxygen saturation using pulse oximeter
IV	Intravenous	**UCT**	Uncommon complication of transfusion
NEC	Necrotising enterocolitis		

Key SHOT messages

- Atypical complications of transfusion can occasionally occur, and reporting such cases helps improve awareness and patient safety
- All relevant investigation findings, including laboratory test results are required by SHOT to enable accurate categorisation and imputability to be assigned

Recommendations

- Reporters are encouraged to continue to report cases with unusual reactions to transfusion including suspected cases of transfusion-associated neonatal NEC
- Investigations into suspected reactions should follow BSH guidelines (Soutar, et al., 2023)
- Information to raise awareness of unusual complications of transfusion should be incorporated into clinical transfusion training

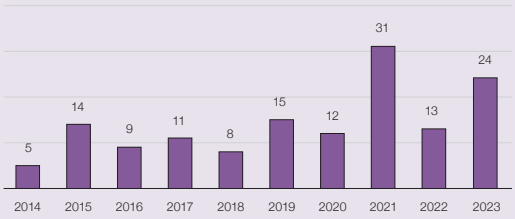
Action: Hospital transfusion committees, all staff involved in transfusion

SHOT
Serious Hazards of Transfusion

Headline data 2023

Number of reports n=24
Deaths n=2
Major morbidity n=1

UCT reports by year



Demographic data

Male n=10
Female n=13
Unknown n=1

Adults n=17
Paediatric n=6
Unknown n=1

Blood component data

Red cells n=20
Platelets n=4
Plasma n=0
Multiple components n=0
Other n=0

Introduction

This category includes cases with uncommon reactions reported in patients with a temporal relation to transfusion which cannot be classified into other categories. Patients often have multiple comorbidities which may contribute to the complication noted. Reporting and analysing these helps to facilitate our ever-evolving understanding of transfusion complications thereby improving the safety of transfused patients through the implementation of appropriate risk-reduction measures. Occasionally, uncategorisable error reports are included in UCT to ensure learning is captured and shared.

Deaths related to transfusion n=2

There were 2 deaths reported in this category, both recorded as imputability 1, possibly related to transfusion.

Case 20.1: Acute transfusion reaction resulting in patient death

An elderly patient with myelodysplastic syndrome and chronic transfusion-dependent anaemia developed sudden onset acute abdominal pain, along with associated nausea while receiving a second unit of red cells in an outpatient setting. The red cells were compatible, and all pre-administration checks had been performed as required. The transfusion was stopped immediately, all observations were within normal range with no pyrexia, hyper or hypotension, tachycardia, or bradycardia. The IV line was changed for IV saline. The patient was reviewed by the medical team and given chlorphenamine IV and hydrocortisone IV. The unused blood was returned to the transfusion laboratory along with the relevant blood samples. The unit was tested locally and was sent to the Blood Service for further testing. The patient was admitted to the ward and was treated for a transfusion reaction, further deterioration, and for suspected sepsis. The patient subsequently died, and the case was referred to the coroner.

No further details on the outcome of the coroner's investigation or laboratory findings were available to SHOT. While the clinical picture could be multifactorial, the case has been included here in view of the temporal relationship of the reaction with transfusion.

Case 20.2: Acute deterioration and death following a red cell transfusion in a neonate with pre-existing comorbidities

A premature baby required intubation in the delivery room and was transferred to the neonatal unit for respiratory support. The baby was noted to have acute respiratory distress syndrome,

hyperkalaemia, suspected sepsis, mild left pulmonary artery stenosis, anaemia of prematurity, hyperglycaemia, acute bowel, possible NEC. On day 28 post delivery, anaemia was treated with red cell transfusion based on a Hb of 84g/L. The transfusion event was uneventful but a concerning change in the infants' condition was noted later the same day with the presentation of a distended tense abdomen. The infant continued to deteriorate, requiring additional interventions and support, including re-intubation. The baby was diagnosed with a bowel perforation and worsening metabolic acidosis. Despite all efforts, the baby died.

The likelihood that the death was related to the transfusion was originally reported with an imputability of 3 (certain) however, based on the information provided, and following discussion with paediatric haemovigilance experts, the imputability was downgraded to 1 (possible). This case is also described in Chapter 24, Paediatric Cases, Case 24.1.

Major morbidity n=1

Case 20.3: Venous air embolism following inappropriate preparation of line prior to transfusion

A postoperative patient in recovery required a recheck of Hb with a decision to transfuse red cells if the Hb was <80g/L. The first Hb result was 83g/L but following repeating testing Hb was 78g/L which deemed the transfusion necessary, and a unit of red cells was requested from the transfusion laboratory. The first nurse was instructed to go on a break and a handover was given to the ODP who would take over the patient's care and initiate the transfusion. The ODP checked the blood component with the authorisation/prescription and patient's identification band and spiked the blood bag with a giving set. The giving set included a warming device and extension line distal to the warmer and attached to the patient's IV cannula. The patient quickly presented with central chest pains and a decreasing saturation - SpO2 to 50%.The transfusion was stopped, and a possible transfusion-related reaction was suspected. It was noted that approximately 10cm of wide bore extension tubing was clear and a rapid call was sent to the floor anaesthetist for medical assistance. A transfused air embolus was confirmed. A rebreathing mask was applied at 15L of oxygen which was changed to water circuit with positive end-expiratory pressure. The SpO2 increased to 96%. Crystalloids were commenced and the patient was transferred to the high-dependency unit for level 2 care for further observation. The patient was visited by the attending consultant anaesthetist and duty of candour was applied. The patient recovered and survived.

This case was initially reported as a handling and storage error, but after review, in view of adverse patient impact, this case was transferred to the UCT category.

There was a complete and thorough investigation into this case. The investigation considered several aspects including the presence of the handover documentation in the patient's notes, staffing levels at the time which were deemed to be safe and the environment, which was described as calm and free from external distractions. Consideration was given to the use of infusion pumps which may have mitigated some risk by the identification of air within part of the giving set. It was noted that the department fostered an open culture and actively encouraged all members of the team to speak up when they had concerns regarding patient safety. The surgical care pathway, anaesthetic charts, prescription, and critical care notes were clearly documented and provided an accurate account of instructions, timeline, and interventions. The ODP had attended training for blood transfusion however, this had occurred during the COVID-19 pandemic, which meant that underpinning knowledge may not have been optimal. Furthermore, the practitioner's exposure to transfusion practice was minimal and it was recognised that the gap in knowledge and skills contributed to the error.

Other UCT cases n=21

There were 3 paediatric cases, which were part of a cluster of 5 cases all from the same hospital and were unusual transfusion reactions in multiply transfused patients. These reactions had common features including rapid onset after small volume of red cells transfused, coughing, chest tightness, drowsiness in 4/5, wheeze in 2/5. Four out of 5 patients received adrenaline. These are discussed in Chapter 24,

Paediatric Cases. Two of the 5 cases met the criteria for FAHR and are therefore included in Chapter 17, Febrile, Allergic and Hypotensive Reactions (FAHR). The other 3 cases, however, were atypical and have therefore been assigned to UCT. Despite detailed review and investigation, no underlying common cause for the cluster of reactions was identified. These cases highlight the importance of local review of transfusion reactions by hospital transfusion teams as the fact that they all occurred at the same location would not have been detected by SHOT.

Several other cases were reported in this category and have been detailed in the supplementary information on the SHOT website (https://www.shotuk.org/shot-reports/report-summary-and-supplement-2023/).

Learning points

- Patients experiencing new, unusual symptoms or signs associated with a transfusion must be evaluated promptly and treated as expeditiously as possible to minimise the impact
- Clinical staff involved in transfusion must be adequately trained to recognise, and be encouraged to report, uncommon complications of transfusion
- A defined process for reporting, reviewing, and trending non-typical complications of transfusion will ensure learning from these events, inform practice, and improve transfusion safety

Conclusion

Patients receiving transfusions often have complex underlying comorbidities which may mimic or mask a transfusion reaction. This makes it challenging for healthcare staff to assign accurate imputability of the patient's reaction/complication to transfusion. All staff involved in the transfusion process have an integral part to play in the early identification, management, investigation and reporting of unusual reactions to transfusion in neonates, children, and adults. Improving knowledge on recognising transfusion reactions for all staff involved in the monitoring of transfusion recipients is vital for the early detection and treatment of these to minimise the impact of the reaction and optimise transfusion safety.

Reference

Soutar, R. et al., 2023. Guideline on the investigation and management of acute transfusion reactions. *British Journal of Haematology,* 201(5), pp. 832-844. doi: https://doi.org/10.1111/bjh.18789.