20 Uncommon Complications of Transfusion (UCT) n=12

Author: Shruthi Narayan

Definition:

Occurrence of an adverse effect or reaction temporally related to transfusion, which cannot be classified according to an already defined transfusion event and with no other risk factor other than the transfusion, and no other explanation.

Serious reactions in this category are reportable to the European Union (EU) as 'uncategorised unintended responses'.

Key SHOT message

- It is important that atypical complications seen in patients post transfusion continue to be reported to SHOT. This category includes those that are temporally correlated to transfusion but with non-specific clinical features that cannot be classified into any of the other known categories. This will help gain a better understanding of these complications, identify risk factors, and develop risk-reduction strategies

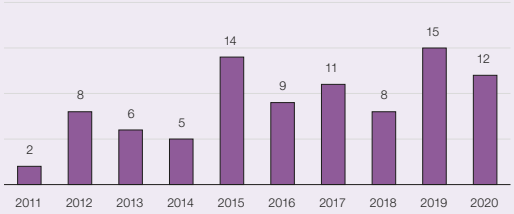
Abbreviations used in this chapter

AML	Acute myeloid leukaemia	**TANEC**	Transfusion-associated NEC
NEC	Necrotising enterocolitis		

Headline data 2020

Number of reports n=12
Deaths n=3
Major morbidity n=0

UCT reports by year



Demographic data

Male n=5
Female n=7
Adults n=11
Paediatric n=1

Blood component data

Red cells n=6
Platelets n=4
Plasma n=0
Multiple Components n=1
Other n=1

Recommendation

- Reporters are encouraged to continue to report cases with unusual reactions to transfusion

Action: All staff involved in transfusion, hospital transfusion teams

Introduction

Reactions are occasionally reported with temporal relation to transfusions which cannot be classified into other SHOT categories. These cases are included in this chapter. Often several other contributory factors can be identified that may have resulted in the patient's reactions. Reporting and reviewing these cases will help in our ever-evolving understanding of transfusion complications, helping improve patient safety by implementing appropriate risk-reduction measures. Occasionally, error reports that do not fit under other categories are included here to ensure learning is captured and shared.

Deaths n=3

There were 3 deaths reported in this category, all with imputability recorded as 'possible'.

Of these, 1 was a suspected case of TANEC, in an extremely premature baby who developed NEC ~ 6.5 hours following red cell transfusion. Another patient death where transfusion possibly contributed was a young patient with AML, neutropenic post-chemotherapy, who received one unit of apheresis platelets on the haematology day unit. On returning home they became severally unwell and were admitted to critical care and intubated. The patient died, the medical team related this to toxic shock and sepsis. The last death in this category involved a man in his mid-50s with oesophageal cancer and liver metastases. He had been admitted with fatigue, nausea and vomiting, chemotherapy reaction and bleeding. He received one unit of red cells and was on tranexamic acid. The patient was stable and alert prior to transfusion. The transfusion started and 15-minute vital signs completed, 10 minutes later the patient was found collapsed and unresponsive across the bed and pronounced dead. There were no signs of anaphylaxis or angioedema. The treating team concluded that death was related to underlying metastatic malignant disease.

TANEC

NEC is a serious neonatal gastrointestinal condition associated with significant morbidity and mortality. It affects 5-7% of preterm low birth weight (500g-1500g) infants. It is postulated that trigger events and environmental factors initiate intestinal injury in a vulnerable infant, prompting a hyper-inflammatory response. TANEC is NEC occurring within 48 hours of a red cell transfusion. From numerous observational/ case-control studies it is estimated to occur after approximately 25-35% of transfusions, generally in older infants born more preterm than others with NEC; multiple pathogenic mechanisms have been proposed. It has been difficult to establish causation or true association (Amin et al. 2012, Faraday et al. 2020, Hackam et al. 2019, MohanKumar et al. 2019).

Between 2011-2019, 19 cases of TANEC have been reported to SHOT. All babies had received a red cell transfusion. Of those who had gestational age recorded (13/19, 68.4%) were preterm, with a median gestation of 26^{+6} weeks (range 23^{+3} to 33). Age at presentation with TANEC was less than 28 days for 5 cases (youngest 10 days), 1 month for 13 cases, and 2 months for a single case. For all cases where a time of onset of symptoms following transfusion was stated (16/19, 84.2%) these occurred within 24 hours of transfusion with a mean of 3 hours. This was a very sick cohort of infants and 7 babies died. Nine babies were assessed to have had major morbidity in relation to TANEC. The imputability in 6 deaths was concluded as possibly related to transfusion and 1 was unrelated.

TANEC is associated with significant morbidity and mortality. The cases reported to SHOT had gestational and postnatal age characteristics in line with those previously described for TANEC. Based on available observational studies, there appears to be under-reporting of these cases to SHOT. Staff should be aware of this potential association between transfusion and NEC in sick infants. TANEC cases are SHOT reportable, reporting helps share the learning and can identify common themes with increasing cohort numbers.

Major morbidity n=0

Other cases n=9

The remaining cases reported under this category are described in the supplementary information on the SHOT website (https://www.shotuk.org/shot-reports/report-summary-and-supplement-2020/).

Learning point

- Patients experiencing symptoms or signs consistent with an acute reaction during or after a transfusion must be evaluated promptly, with input from the Blood Service. These should be treated as expeditiously as possible to minimise the impact of the reaction and reported to SHOT as appropriate

Conclusion

Transfusion reactions range from bothersome yet clinically benign to life-threatening and can be acute or delayed. The nature of the reaction may not be immediately apparent, as many reactions begin with nonspecific symptoms such as fever or chills. In addition, patients receiving transfusions often have complex underlying clinical conditions, the symptoms of which may mimic a transfusion reaction. As evident from the cases included in this chapter, it is often challenging to attribute imputability of the patient's reaction/complication to transfusion when there are multiple ongoing medical and surgical issues in the patient. All cases need to be reviewed to ensure learning from these events helps inform and improve practices.

References

Amin SC, Remon JI, Subbarao GC, et al. Association between red cell transfusions and necrotizing enterocolitis. *J Matern Fetal Neonatal Med* 2012;**25(5)**:85-89. doi:10.3109/14767058.2012.715465.

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