Summary of Incidents Related to Transplant Cases n=70

23

Authors: Alison Watt and Paula Bolton-Maggs

Transfusion-related problems in transplant cases have been summarised since 2012, noting incidents in both haemopoietic stem cell transplants (HSCT) and solid organ transplants.

Key SHOT messages

- Good communication is vital to prevent transfusion errors in transplant patients
- The recommendations from the Advisory Committee on the Safety of Blood, Tissues and Organs (SaBTO) and the British Society for Bone Marrow Transplantation (BSBMT) for the requirement for HEV-screened components for some transplant patients will require robust policies for management and communication in both the clinical and laboratory areas
- Specific national guidelines are still needed for both transplantation and transfusion professionals that cover the procedures necessary for managing transfusions to transplant patients, especially where ABO/D-mismatched transplants have been given

Transplants that are ABO-incompatible or mismatched for the D antigen require clear protocols for transfusion. Errors are also made related to the specific requirements of transplant patients (e.g. the need for irradiated components). Some unusual errors were made which demonstrate the complexities of transfusing transplant patients (Table 23.2). The number of transplant cases reported increased in 2015 to n=70 (n=46 in 2014)) Figure 23.1.

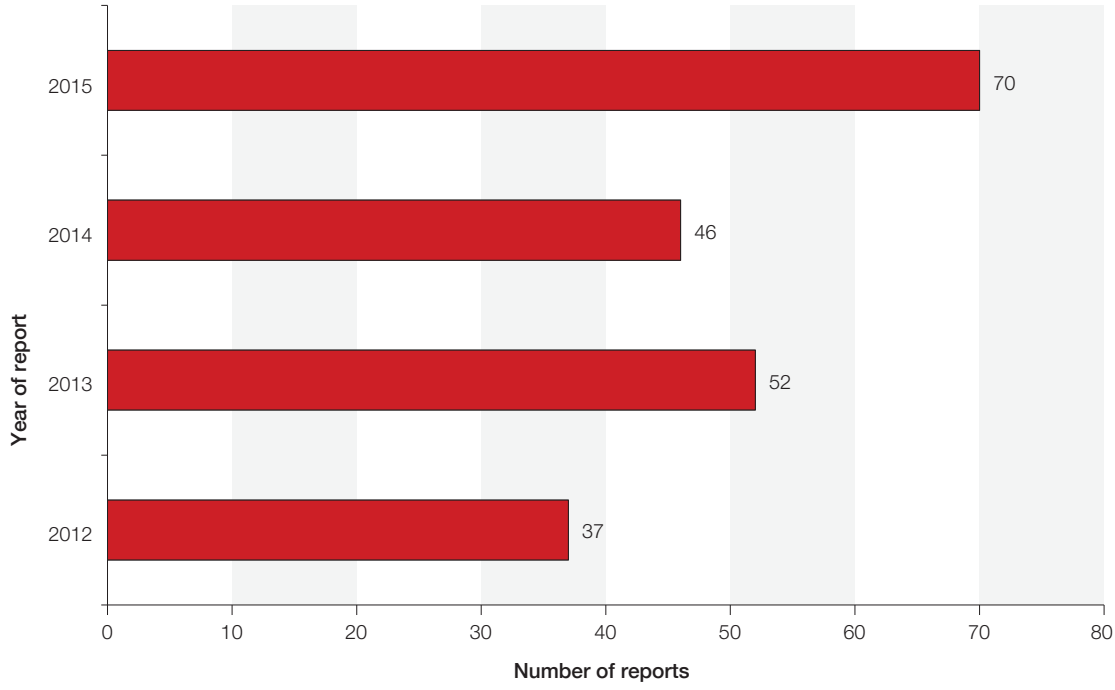

Figure 23.1: Transplant transfusion errors 2012–2015 n=205

Table 23.1: Summary of errors made in transplant cases n=70

Type of transplant	ABO/D errors	SRNM*	Other**	Total
HSCT	34	26	1	61
Solid organ	2	5	2	9
Total	**36**	**31**	**3**	**70**

SRNM=specific requirements not met

***Other=summary of 3 cases in Table 23.2*

Table 23.2: Non-ABO/D or SRNM transplant errors n=3

SHOT Category*	Description of error	Outcome
ADU (undertransfusion)	Patient with sickle cell disease on hypertransfusion to suppress haemopoiesis pre-transplantation was not transfused despite Hb 112g/L, which dropped to 96g/L two weeks later	No adverse reaction
Anti-D	D-negative female of childbearing potential given D-positive renal transplant. No quantification of D-positive red cells and received 2500IU anti-D at least 5 days after the event	Patient checked six months post transplant; no anti-D detected
HTR	Patient showed symptoms of a haemolytic transfusion reaction (HTR). History indicated patient was suitable for electronic issue (EI), but the HTR investigation revealed a 2+ incompatibility with the first unit given, possibly due to an antibody to a low frequency antigen. Further investigation revealed the patient had a history of previous reactions at another hospital, and had also had a solid organ transplant. Both of these factors would have deemed the patient unsuitable for EI, but were not communicated to the laboratory	Life-threatening acute reaction requiring immediate medical intervention

**ADU=avoidable, delayed or undertransfusion; Anti-D=adverse events related to anti-D immunoglobulin*

ABO and D errors n=36

Table 23.3: ABO and D errors in transplant cases n=36

SHOT category	ABO error	D error	Total
Incorrect blood component transfused (IBCT)	16	5	21
Near miss	10	5	15
Total	**26**	**10**	**36**

There were no known adverse outcomes for any patient receiving inappropriate ABO/D components, but the unintentional transfusion of ABO-incompatible blood components is a never event in England (NHS England 2015) and in Scotland these would be 'red incidents' through the Scottish National Blood Transfusion Service clinical governance system and/or those of the Health Board. It is not known whether reporting organisations are reporting these as never events.

Table 23.4: Details of ABO-incompatible transfusions to allograft HSCT patients

ABO/D	Component	Gender	Patient group	Donor group	Group transfused	Error
Incorrect blood component transfused (IBCT) as a result of clinical error						
ABO and D	Mixed	Unknown	B D-positive	A D-negative	B pos RBC B neg PLT A pos PLT	ABO-incompatible & D-mismatch
Incorrect blood component transfused (IBCT) as a result of laboratory error						
ABO	RBC	Male	A	B	A	ABO-incompatible
ABO	RBC	Male	A	O	A	ABO-incompatible
ABO	RBC	Female	A	O	A	ABO-incompatible
ABO	RBC	Male	B	A	B	ABO-incompatible
ABO	RBC	Male	A	O	A	ABO-incompatible

RBC=red blood cells; PLT=platelets

ABO and D errors have increased in 2015. Figure 23.2 summarises these cases from 2012 to 2015

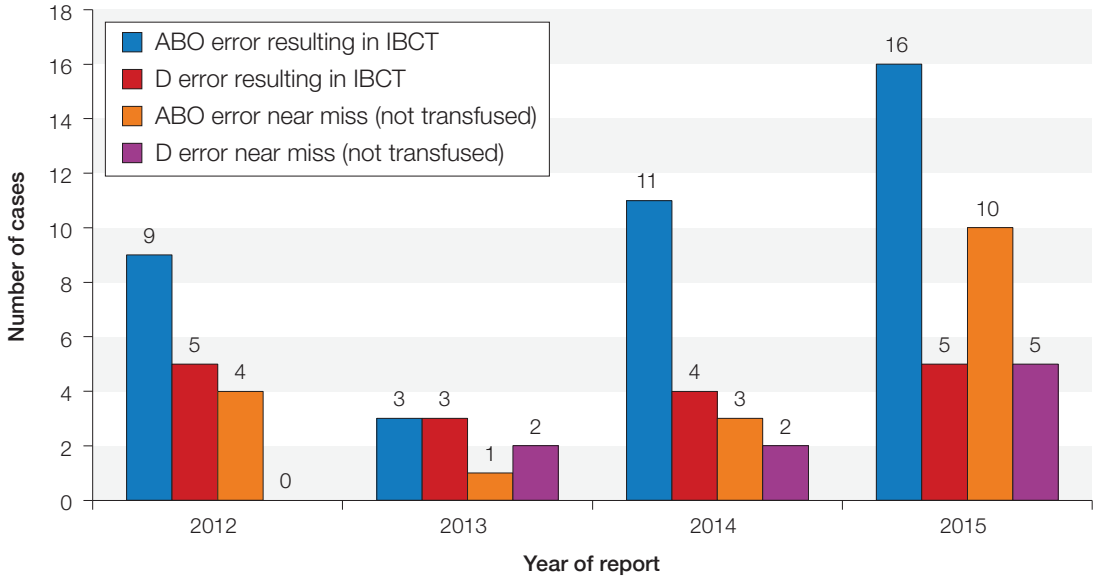

Figure 23.2: Transplant ABO and D errors 2012–2015, n=83

Specific requirements not met n=31

SHOT category	Irradiated	Other*		Total
Errors related to solid organ transplants				
SRNM clinical error	3	0		3
SRNM laboratory error	0	1	Sample validity	1
Near miss clinical error	0	0		0
Near miss laboratory error	1	0		1
Subtotal errors solid organ	**4**	**1**		**5**
Errors related to HSCT				
SRNM clinical error	13	1	HLA	14
SRNM laboratory error	2	2	EI	4
Near miss clinical error	7	0		7
Near miss laboratory error	1	0		1
Subtotal errors HSCT	**23**	**3**		**26**
Total	**27**	**4**		**31**

**EI=electronic issue; HLA=human leucocyte antigen*

Table 23.5: Failure to provide components with specific requirements for transplant patients n=31

Specific transfusion requirements for transplant patients can be complicated and now include recommendations for HEV-screened blood components for patients receiving solid organ transplants or allograft HSCT (SaBTO 2016). All errors associated with failure to provide or transfuse HEV-screened components should now be reported to SHOT in the 'specific requirements not met' category.

The need for irradiated components for some patients receiving solid organ transplants has been challenged. A recent retrospective single-centre review noted that there were no cases of transfusion-associated graft versus host disease among 647 renal transplants patients who received non-irradiated components in the context of alemtuzumab (Campath, anti-CD52) conditioning therapy (Hui et al. 2016). This centre decided not to follow the 2010 guidelines (BCSH Treleaven et al. 2011, online November 2010), and did not institute irradiated components for these patients in the absence of other indications.

These guidelines are being revised by the Transfusion Task Force of the British Committee for Standards in Haematology (BCSH), but until then the current guidance remains in place (BCSH Treleaven et al. 2011).

Causes of errors

Table 23.6: Causes of all transplant errors, including near misses n=70

Error made	ABO/D error	SRNM	Other	Total
Errors related to solid organ transplants				
Clinical error – protocol or communication	0	2	1	3
Clinical decision making	1	1	0	2
Laboratory error – LIMS flags not heeded or updated	1	0	0	1
Lack of understanding in laboratory	0	2	1	3
Subtotal errors solid organ	**2**	**5**	**2**	**9**
Errors related to HSCT				
Clinical error – protocol or communication	11	20	0	31
Clinical decision making	0	1	1	2
Laboratory error – LIMS flags not heeded or updated	16	5	0	21
Laboratory error – communication	3	0	0	3
Lack of understanding in laboratory	4	0	0	4
Subtotal errors HSCT	**34**	**26**	**1**	**61**
Total	**36**	**31**	**3**	**70**

LIMS=laboratory information management system

COMMENTARY

Since 2012 SHOT noted that there is little guidance available for transfusion of transplant recipients. The following requirements are either not addressed or are not clear within national transfusion or transplantation guidelines:

- Procedures, particularly communication protocols, necessary for managing transfusion in transplant patients

The European School of Haematology (ESH)/European Group for Blood and Marrow Transplantation (EBMT) handbook (Pawson and Pamphilon 2012) includes the advice 'It is essential to define robust transfusion policies and procedures and these should be regularly audited.' No similar guidance appears to exist for solid organ transplantation.

- Management of female transplant patients who are of childbearing potential, where D-positive transplants have been given to D-negative recipients
- Protocols for the use of plasma-rich components in the immediate post-transplant period following an ABO-incompatible solid organ transplant until the organ is accommodated (Koch et al. 2004)
- Transfusion risks associated with passenger lymphocyte syndrome (PLS)

This is covered within the existing BCSH guidelines for pre-transfusion compatibility procedures in blood transfusion laboratories (BCSH, Milkins et al. 2013), but SHOT has previously suggested this could be supplemented by guidance produced in conjunction with transplantation experts (Bolton-Maggs et al. 2015).

Many healthcare institutions have their own guidelines and protocols, such as those from Newcastle cardiothoracic unit (Aujayeb et al. 2014), but SHOT recognises that the lack of national guidance may be contributing to the confusion that leads to errors such as those described in this chapter.

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