SHOT data 2007 – Part 1

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SHOT in 2007

- Timing of meeting
- Working with MHRA
- Development of European Guidelines on reporting
- New chapters – Anti-D, TACO, Autologous
- Additional definition of major morbidity
  - Reaction resulting in a low or high haemoglobin level of a degree sufficient to cause risk to life without immediate medical intervention

Number of cases 2006 and 2007

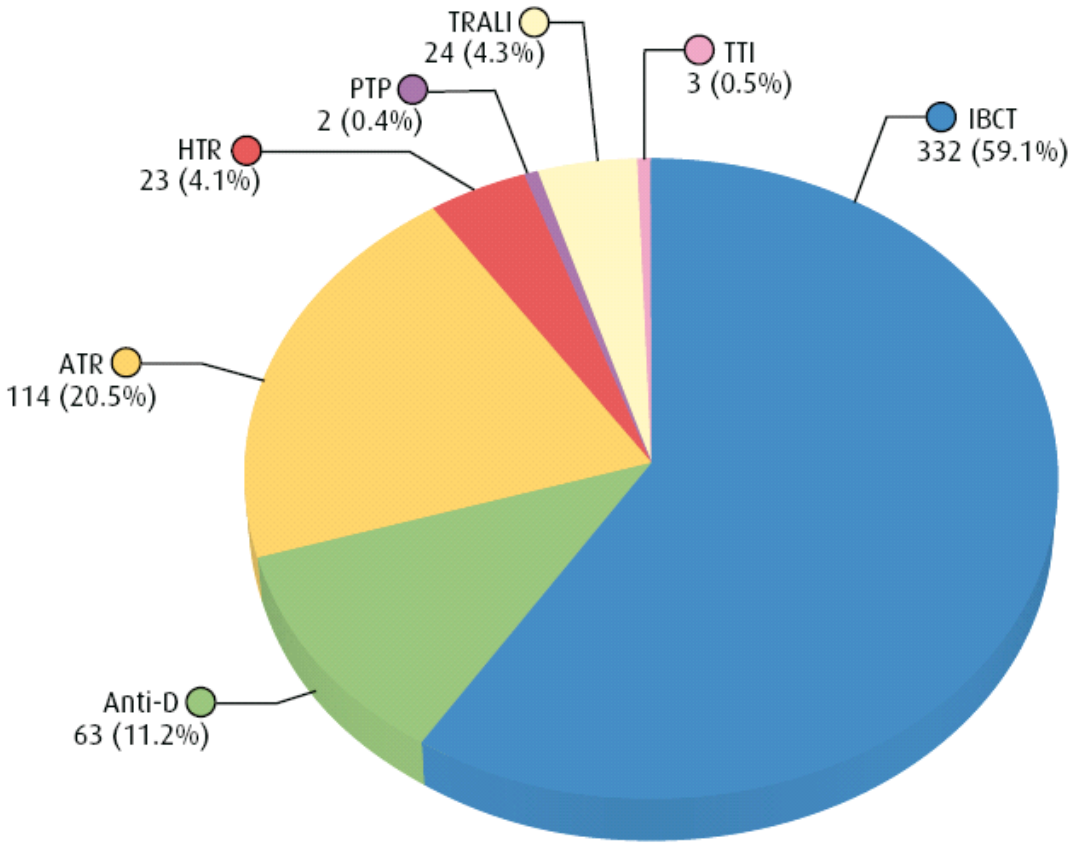
- Cases in 2006 Annual Report

IBCT	ATR	HTR	PTP	TA-GvHD	TRALI	TTI	Totals
400	85	34	0	0	10	2	531

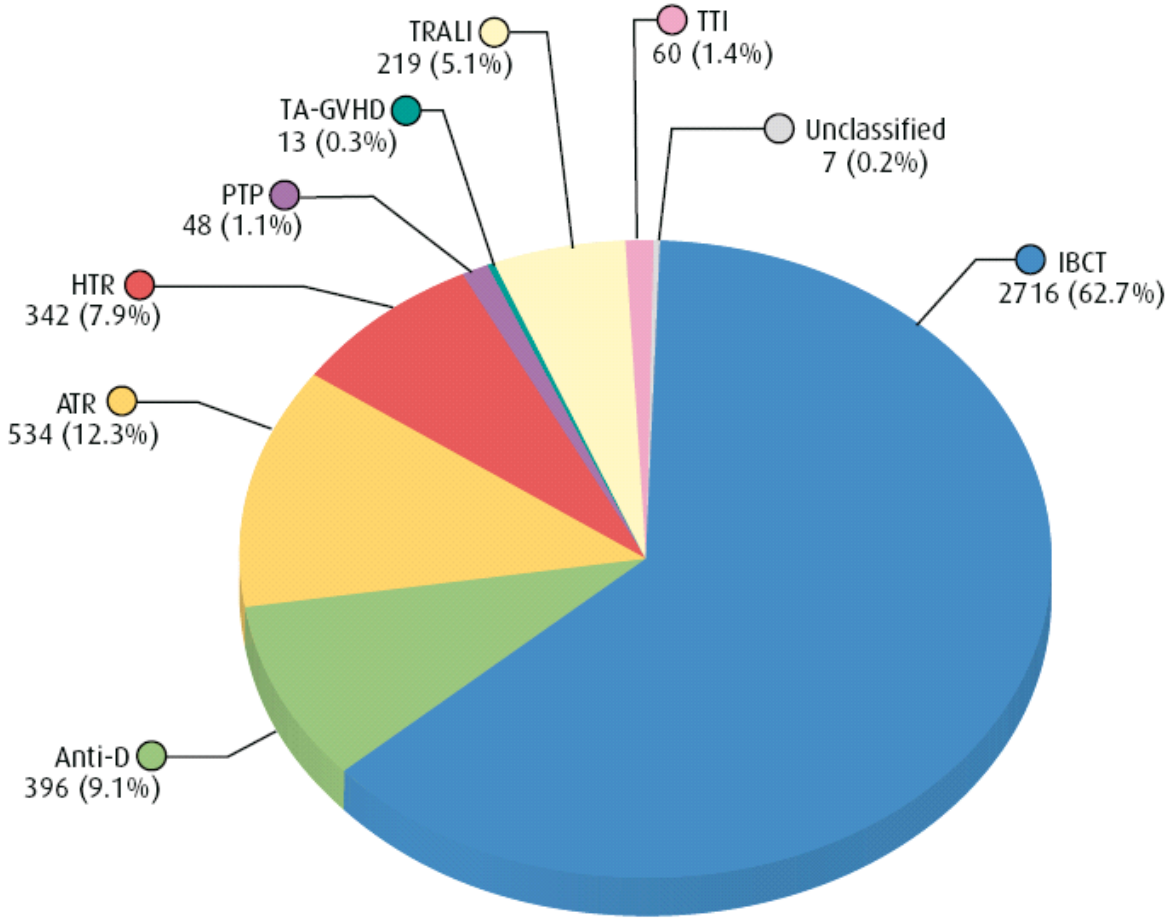
- Cases in 2007 annual report

IBCT	Anti-D	ATR	HTR	TRALI	PTP	TA-GVHD	TTI	Totals
332	63	114	23	24	2	0	3	561

SHOT cases 2007



Cumulative cases 1996 - 2007



Mortality 2007

- Lowest ever - no IBCT related deaths
- 1 death probably attributable to transfusion
  - case of probable TRALI in which the patient died
- 3 cases in which the patients died and the transfusion reaction was considered to be contributory
  - One ATR in a very sick 8 month old baby
  - Two HTRs in patients with multiple co-morbiditiy

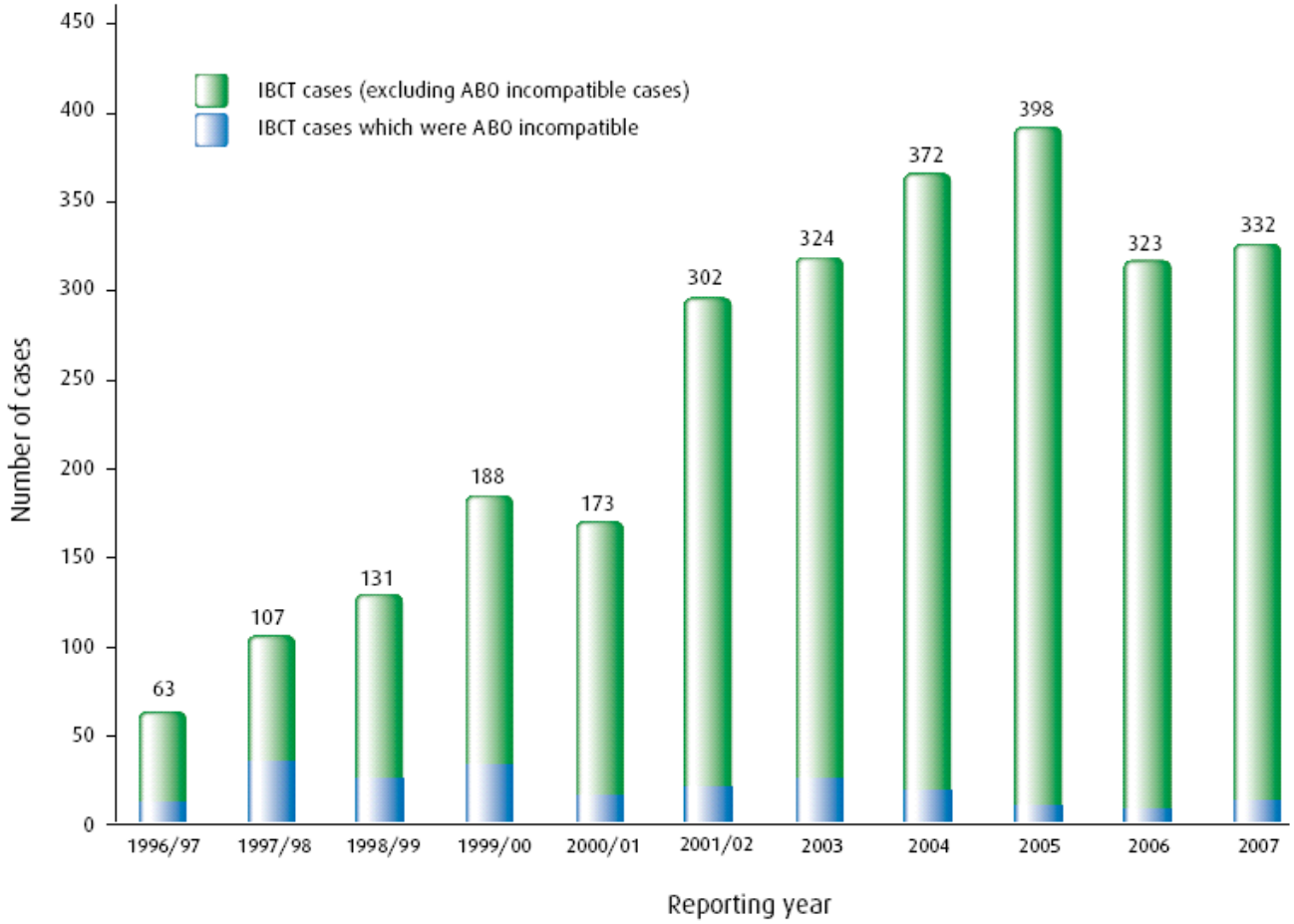
Major Morbidity 2007

- IBCT – there were 7 cases of major morbidity
  - 4 ABO incompatibility
  - 2 inappropriate transfusion causing TACO
  - 1 over transfusion causing Hb 22 g/dl
- Anti-D - 24 cases
  - potential sensitisation of a woman of childbearing age to the D antigen
- Other categories total of 28 cases of major morbidity
  - to be discussed in part 2
- Minor or no morbidity – 498 cases

IBCT overview

• Administration of wrong blood	24
• Wrong blood in tube	7
• Inappropriate or unnecessary transfusion	50
• Handling and storage errors	118
• Special requirements not met *cmv/irrad*	76
• Special requirements not met *other*	17
• Additional lab errors	40
◦ Including ABO and D incompatible	
TOTAL	**332**

IBCT and ABO incompatible cases 2007



ABO and D incompatibility

- 14 cases ABO incompatible components
  - 10 clinical errors (including 1 WBIT)
    - 1 related to ABO incompatible platelets, rest red cells
  - 4 laboratory errors
    - 1 related to ABO incompatible FFP, rest red cells
- 12 cases ABO incompatible red cell transfusion
- 7 cases of D incompatible transfusion
  - 3 clinical errors (including 1 WBIT)
  - 4 laboratory errors
    - 1 involved platelets, rest red cells

Administration of wrong blood - 1

- 23/24 cases involved nursing or midwifery staff only, 1 medical staff only
- 15 cases involved collection of the incorrect unit from the storage site
  - 8 nurse/midwife
  - 3 porters
  - 1 unqualified nurse
  - 2 junior doctors
  - 1 healthcare support worker

Administration of wrong blood - 2

- ABO incompatible transfusion 9
  - 7 involved collection of incorrect unit from storage
- D incompatible 2
  - Unit not given to intended patient
- Compatible wrong blood 10
  - 6 cases correct blood collected
- Incorrect component type 3
  - 2 cases red cells given when platelets were prescribed
  - 1 cases platelets given where FFP was prescribed

Case

- A man with metastatic prostate cancer attended A&E with an Hb of 5.3 g/dl and GI bleeding. Two units of blood for him were collected by a registered nurse and transfusion commenced rapidly through two large cannulae.1 hour after commencement the man had fever, rigors, loin pain and hypotension. Most of both units had been transfused. The nurse called the doctor who stopped the transfusion and noticed the blood was labelled for a different patient. The patient was group O pos and the units given were group B neg. On the advice of a haematology consultant a red cell exchange transfusion was carried out. The patient developed worsening renal failure.

Errors leading to administration of ABO and D incompatible blood

- Errors in following process for collection of components
  - Poor knowledge and recognition of different component types
  - Deployment of unqualified staff to collect components
  - Use of inappropriate documentation, or no documentation, to collect component
- Failures of bedside checking procedure
  - No checking done at bedside
  - Persistent misunderstanding that ‘checking’ can be performed remotely from patient’s side
  - Checking against paper documents being substituted for cross checking against patient’s wristband
- Non recognition of transfusion reaction
  - Lack of understanding of the imperative to monitor patients receiving blood
  - Failure to recognise a transfusion reaction due to insufficient knowledge or experience
  - Not acting appropriately when a patient suffers a reaction, due to lack of appreciation of potential seriousness

Wrong blood in tube

- 7 cases
- 1 case led to ABO incompatible transfusion
- 1 case resulted in D incompatible transfusion
- 4 cases led to the wrong patient being transfused as the Hb was for another patient
- 1 case the D group was of another patient but was compatible
- **In 4 cases definitely (probably 5) phlebotomy had been carried out by a junior doctor**

Inappropriate and/or unnecessary transfusion – 1

- 28 cases based on wrong Hb

Cause of falsely low Hb value	Cases
Falsely low Hb due to phlebotomy from drip arm	5
Hb from massively haemodiluted patient	1
Erroneously low Hb from Hemacue/point of care testing/blood gas analyser	4
White cell count mistaken for Hb	6
Transcription error from telephoned Hb result	4
Albumin value misinterpreted as Hb	1
Hb value misread from computer screen	1
Poor sampling technique resulting in clots, stasis in syringe, etc.	6
TOTAL	**28**

Inappropriate and/or unnecessary transfusion – 2

- 2 cases of inappropriate or unnecessary transfusion based on POCT results
- 3 cases involving haematology and coagulation lab errors

Case:

A 76 year old lady was admitted with a knee dislocation. FBC performed on POCT equipment showed a platelet count of 64 x 10^9/L. The accompanying Hb was 24 g/dl. The junior doctor ordered, prescribed and transfused a pool of platelets despite this being queried by BMS staff. A more senior haematologist was not involved regarding the peculiar results. A normal FBC was later produced by the haematology lab.

Inappropriate and/or unnecessary transfusion – 3

- 17 cases of transfusion based on poor knowledge and prescribing
  - Excessive volume prescribed
    - No knowledge of baseline Hb
    - No clinical assessment of patient
    - Over transfusion of small patients (adults and children)
    - No monitoring of Hb during/following transfusion
    - Unfamiliarity with triggers for transfusion and appropriate rates and quantities
  - Not understanding instructions from senior staff
  - Not heeding platelet transfusion triggers pre-procedure
  - Inappropriate use of emergency flying squad blood

Case

- An 81 year old man was transfused with 4 pools of platelets within 4 hours pre-operatively. He developed severe CCF, the surgery was cancelled and he was appropriately managed. The orthopaedic SpR had written ‘Arrange 4 units of platelets’ in the notes, and the house doctor thought this meant to transfuse them. The order was queried by the BMS, but senior advice was not sought.

Case

- Between 29/01 when his Hb was 6.3 g/dl, and 23/04, a patient with chronic anaemia was transfused with 24 units of packed cells over 8 separate occasions, 2 to 4 at a time. The Hb was not checked until 09/05 when it was 22 g/dl. The patient was venesected urgently and suffered no long term adverse consequences.

Cases

- A 70 year old lady with colitis weighing 41.5 kg had a Hb of 6.7 g/dl. She was given a 4 unit red cell transfusion resulting in a Hb of 18.1 g/dl.

- A 2 year old with possible ruptured appendix had a Hb of 6.7 g/dl. Transfusion at a dose of 15 ml/kg was written in the notes. The junior doctor wrote up 2 units of red cells which were given over 6 hours resulting in a Hb of 18.6 g/dl.

TACO - 1

- New category of reporting for 2008
- TACO defined as any 4 of the following that occur within 6 hours of transfusion:
  - Acute respiratory distress
  - Tachycardia
  - Increased blood pressure
  - Acute or worsening pulmonary oedema
  - Evidence of positive fluid balance

TACO - 2

- Not been requested previously so not reported
- 3 cases singled out in this report
- TRIP reported 34 cases TACO in 2006 – largest category apart from NHFTR, mild allergic and ‘new allo-antibody’ categories.

Case

61 year old male with INR 6.0 given vitamin K and 4 units FFP. Without further testing he was given another 3 units FFP. De-saturated to 80%, wheeze etc. Responded to oxygen and diuretics. Surgery delayed.

Handling and storage

- Increased to 118 cases in this report from 74 in 2006 – possible BSQR effect
  - Technical administration errors 15
  - Transfusion of expired red cells 12
  - Excessive time to complete transfusion 57
  - Cold chain errors 34
    - Of which 20 were laboratory errors

Special requirements not met

- 76 cases for CMV/irradiation requirement
  - Clinical errors and omissions 49
    - 46 irradiation
    - 3 CMV negative
  - Laboratory errors and omissions 25
    - 21 irradiation
    - 3 CMV negative
    - 1 both
  - Blood service errors and omissions 1
  - Miscellaneous – IT implementation 1
- 17 cases for ‘other’ requirement
  - Clinical 2
  - Laboratory 15

Special requirements not met – CMV neg and irradiation -

- 46 clinical cases with omission to request irradiated components:
  - 12 Hodgkin's disease
  - 19 prescription of purine analogues
  - 9 SCT or conditioning pre SCT
  - 3 post intra-uterine transfusion
  - 1 Di George syndrome
  - 1 neonate for truncus arteriosus surgery
  - 1 unknown indication

Adverse events originating in the hospital transfusion laboratory

- 121 adverse events altogether
  - IBCT 96
    - Wrong blood 15
    - Wrong group selected for SCT patient 5
    - Other pre-transfusion testing errors 20
    - Special requirements not met 36
    - Handling and storage errors 20
  - Anti D 24
  - HTR 1

Anti-D related events

Type of event	Cases	Primary *(All)* Errors		
		Midwife / Nurse	Laboratory	Doctor
Omission or late administration of anti-D Ig	**24**	22 *(24)*	2	-
Anti-D Ig given to D positive patient	**17**	3 *(5)*	11	3
Anti-D Ig given to patient with immune anti-D *(In 4 reported cases, there was no actual error involved)*	**6**	*(1)*	2	-
Anti-D Ig given to mother of D negative infant	**6**	-	6	-
Anti-D given to wrong patient	**6**	5 *(5)*	-	1
Wrong dose of anti-D given	**2**	*(2)*	2	-
Anti-D Ig expired or out of temperature control	**1**	*(1)*	1	-
Other *(anti-D Ig administered instead of anti-tetanus globulin)*	**1**	-	-	1
Total cases **Total errors: Primary / *(All)***	**63**	30 *(38)*	24 *(24)*	5 *(5)*
		59 *(67)*		

Key message

- Two main themes have emerged from the data in 2007:
  - Failure of bedside checking procedures which would have prevented all the clinical cases of wrong blood administration
    - Training and competency assessment
  - Prominence of knowledge gaps and lack of education and training in junior doctors
    - Professional responsibility
    - Medical education

Thanks

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