The impact of providing blood to the scene of an accident on transfusion laboratory practice

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Introduction

- Trauma is the UK's leading cause of death for the under-40s
- 25% die within 6 hours
- Haemorrhage accounts for 40% of trauma deaths.
- 1/3 of trauma patients have a coagulopathy on arriving in hospital.
- Patients that receive massive transfusions have an increased risk of sepsis, multi-organ failure and longer hospital stays.
- Commencing transfusion in the 'golden hour' can prevent patients from requiring massive transfusion.

London Trauma Network

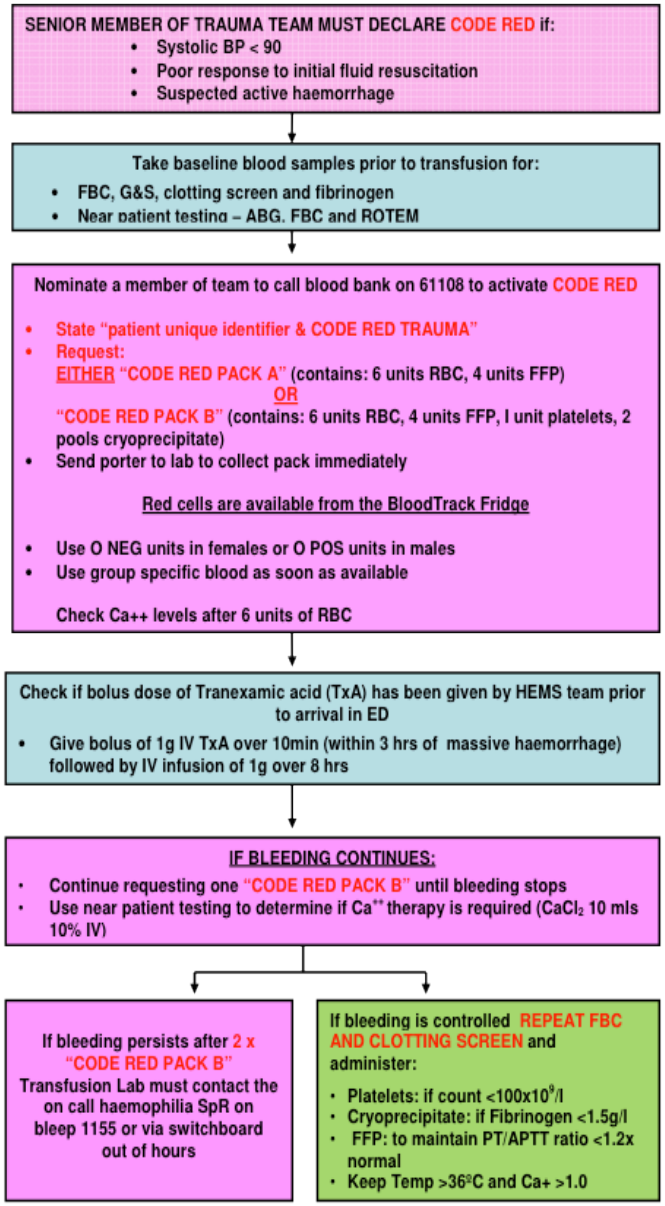
- 4 Regional Trauma centres providing comprehensive care to trauma patients
- London Air Ambulance (HEMS) treats around 2000 patients/year
- They are airborne within 4 minutes of activation and have an average flight time of 6 minutes
- In March 2012, London Air Ambulance service was the first UK civilian air ambulance service to carry blood for on-scene transfusion

Major Haemorrhage Protocol

- Early transfusion helps to improve volume depletion, acidosis, dilution and coagulopathy.
- Major haemorrhage protocols are mandatory in the UK
- At the Royal London Hospital, Gr O+ RBC are transfused to male patients and Gr O– to female patients.
- Gr O – RBC are given to all trauma bleeding patients in other London Trauma centres

Barts Health NHS
NHS Trust

CODE RED TRAUMA - MASSIVE HAEMORRHAGE



Revised in July 2011

Aims of the study

- In March 2012, London Air Ambulance service was the first UK civilian air ambulance service to carry blood for on-scene transfusion

- Our aims were to assess the impact of this on:
  - the number of mixed fields and unacceptable samples
  - the number of Gr O units given to non-group O patients
  - RBC:FFP ratio

Methods

- 3 yrs Retrospective data was compared with 18 months prospective data
- Patients were identified from the HEMS trauma office for the retrospective cases and transfusion lab for the prospective cases
- Data was collected from hospital laboratory systems

Demographic Data

	Retrospective N=233	Prospective N=119
Male	188 (81%)	84 (71%)
Female	45 (19%)	32 (27%)
Unknown	0 (0%)	3 (3%)
Median age	30 (IQR 23 – 42)	35 (IQR 23 – 51
Royal London	171 (73%)	77 (65%)
Kings	33 (14%)	19 (16%)
St Georges	25 (11%)	7 (6%)
Died before reaching hospital	4 (2%)	15 (13%)

26 St Mary's patients were excluded from the retrospective group and 21 from the prospective group.

Blood groups

		Retrospective	Prospective
Blood group	Known	213 (91%)	80 (67%)
	Unknown	20 (9%)	39 (33%)
Where blood group known	O	83 (39%)	37 (46%)
	Non-O	130 (61%)	43 (54%)

Mixed fields and Unacceptable samples

	No	No results	Yes	Total
Retrospective	147	33	53	233
	63%	14%	23%	100%
Prospective	44	43	32	119
	37%	36%	27%	100%
P value	**<0.05**			

- Significantly higher nr of mixed fields, unacceptable samples or no sample received in the prospective arm.
- Significantly higher number of No mixed field in the retrospective arm.

Group O RBC transfused to non group O patients

- Looked at % of gr O RBC to non gr O RBC received per patients
- Patients were then divided to 2 groups:
  - <95% non group O RBC
  - >95% gr O RBC

	< 95%	>95%	Total
Retrospective	42	76	118
	36%	64%	100%
Prospective	21	56	77
	27%	72%	100%
P value	**NS**		

RBC: FFP ratio

	Mean (Std Dev)	95% Conf Interval
Retrospective N=176	1.6 (.81)	1.4 – 1.7
Prospective N = 70	1.7 (0.10)	1.5 – 1.9
P value	**0.17**	

Discussion

1. There has been a significant increase in the number of mixed field/unacceptable samples and 'no samples' received.
2. No difference was seen in the proportion of group O units transfused to non-group O patients.
3. Non group O patients in both prospective and retrospective arms are receiving high % of group O units, even when patient's blood group is known.
4. This explain why we did not see an difference in point 2 above, even though there was a higher number of mixed fields and unacceptable samples.
5. There has been no change in RBC: FFP ratio.

Conclusion

- Continuous communication with the London Air Ambulance and the clinical trauma teams is needed to aim to reduce the number of mixed field/unacceptable samples received and improve on transfusion of group specific RBC when patient's blood group is known.

- A larger case series will help to identify whether this is an initial effect of a new initiative which will reduce with time.