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

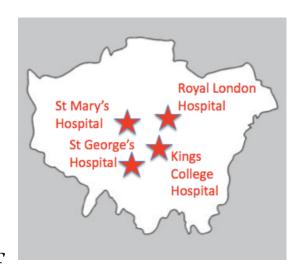
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Introduction

- 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

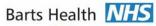
- 4 Regional Trauma centres providing comprehensive care to trauma patients
- London Air Ambulance (HEMS) treats around 2000 patients/year
- They are airborne within 4 minutes of activation and have an average flight time of 6 minutes
- In March 2012, London Air Ambulance service was the first UK civilian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



NHS Trust

CODE RED TRAUMA - MASSIVE HAEMORRHAGE

SENIOR MEMBER OF TRAUMA TEAM MUST DECLARE CODE RED if:

- Systolic BP < 90
- · Poor response to initial fluid resuscitation
- · Suspected active haemorrhage

Take baseline blood samples prior to transfusion for:

- . FBC, G&S, clotting screen and fibrinogen
- Near patient testing ABG, FBC and ROTEM

Nominate a member of team to call blood bank on 61108 to activate CODE RED

- State "patient unique identifier & CODE RED TRAUMA"
- Request:

EITHER "CODE RED PACK A" (contains: 6 units RBC, 4 units FFP)

OF

"CODE RED PACK B" (contains: 6 units RBC, 4 units FFP, I unit platelets, 2 pools cryoprecipitate)

. Send porter to lab to collect pack immediately

Red cells are available from the BloodTrack Fridge

- . Use O NEG units in females or O POS units in males
- Use group specific blood as soon as available

Check Ca++ levels after 6 units of RBC

Check if bolus dose of Tranexamic acid (TxA) has been given by HEMS team prior to arrival in ED

 Give bolus of 1g IV TxA over 10min (within 3 hrs of massive haemorrhage) followed by IV infusion of 1g over 8 hrs

IF BLEEDING CONTINUES:

- Continue requesting one "CODE RED PACK B" until bleeding stops
- Use near patient testing to determine if Ca** therapy is required (CaCl₂ 10 mls 10% IV)

If bleeding persists after 2 x
"CODE RED PACK B"

Transfusion Lab must contact the

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Transfusion Lab must contact the on call haemophilia SpR on bleep 1155 or via switchboard out of hours

Cryoprecipitate: if Fibrinogen <1.5g/l

FFP: to maintain PT/APTT ratio <1.2x
normal

Keep Temp >36°C and Ca+ >1.0

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	O	83 (39%)	37 (46%)
group known	Non-O	130 (61%)	43 (54%)

Mixed fields and Unacceptable samples

	No	No results	Yes	Total
Datus on a stirre	147	33	53	233
Retrospective	63%	14%	23%	100%
Drospostivo	44	43	32	119
Prospective	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	1	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.