

# Incident: LVT given as IUT

BMS Education Day 30/11/2018

Dr Fiona Regan

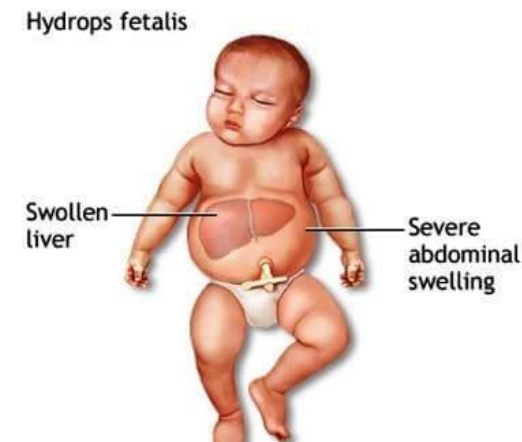
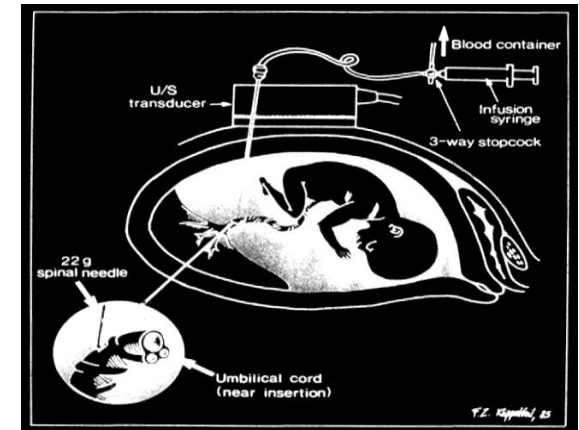
Consultant Haematologist at Imperial College Healthcare  
NHS Trust & NHSBT

# Background

- Woman, 22<sup>+2</sup>/40 pregnant, with anti-D+C+G+E+auto-HI;
  - **Anti-D = >100 IU/ml;**
- Had been referred from DGH at 21/40 with **fetal hydrops**, for emergency IUT;
- At IUT: fetal **Pre-Tx Hb = “in 20’s” g/L**; 20 ml transfused; Post-Tx Hb = “in 70’s” g/L; fetus RhD phenotyped as D positive;
- As so early gestation (21/40), can only transfuse a finite vol of blood, so was needing weekly IUTs for a couple of weeks, to get the Hb up to a good level;

- Prognosis:

High risk fetus – as hydrops++ (↑ risk of death than if no hydrops) plus added risk from early gestation: so risk of 1-2% miscarriage per procedure, 3x weekly, then approx. monthly till term (approx. 6-7 procedures).



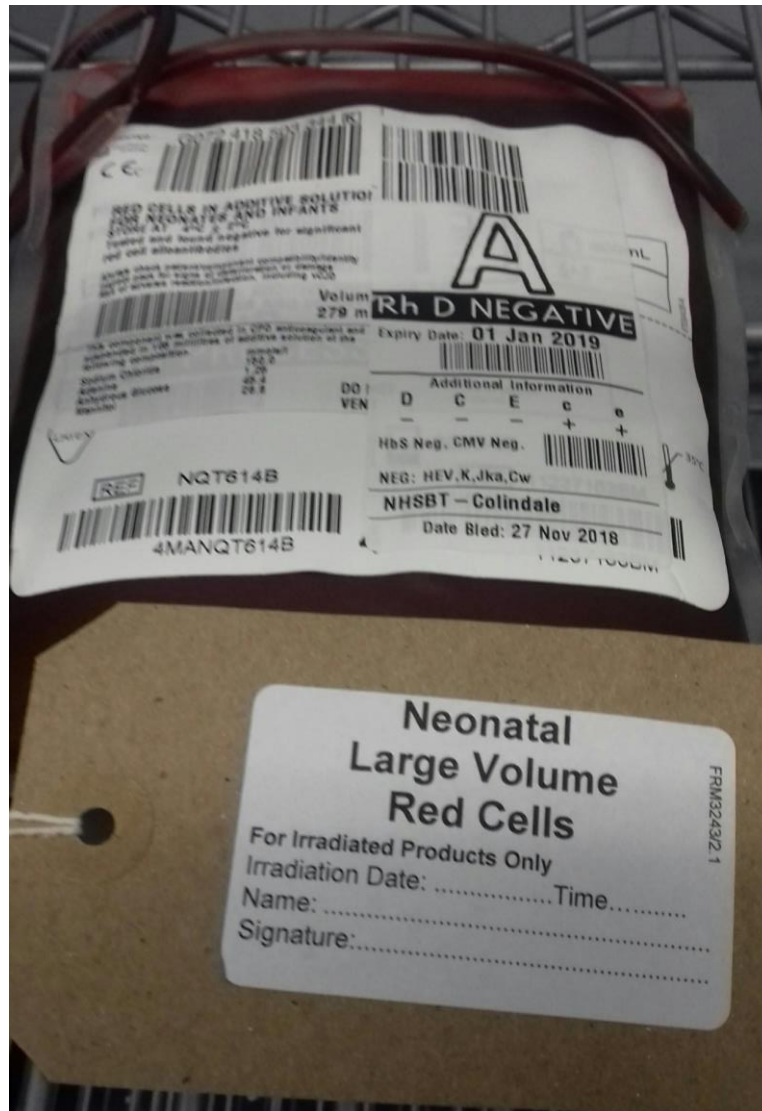
# Background cont.

- Next IUT planned – IUT ordered well in advance;
- IUT took place in morning;
- In afternoon, hospital was notified by RCI, NHSBT that instead of an IUT unit, an **LVT** unit had been supplied in error. A Major Incident had been raised by NHSBT.
- **LVT** = large volume transfusion unit, indicated for neonatal cardiac surgery, where much more blood than usual top-up volumes are needed, because of bypass etc – so that multisatellite packs are unfeasible and needs shorter shelf-life, due to large volume given.
- **Question:**

**What are the differences between an IUT and an LVT unit?**



# LVT units



# Differences between IUT and LVT units:

Criteria	IUT	LVT
CMV neg	√	√
<5 days old	√	√
Irradiated	√	√
HbS neg	√	√
HT neg	√	√
<b>Hct</b>	<b>0.70-0.85</b>	<b>0.50-0.70 (less)</b>
<b>Storage medium</b>	<b>Plasma Reduced</b>	<b>SAGM</b>

# Risks to fetus:

- SAGM:
  - Not ideal to give – as in theory (eg: in exchange transfusion volumes) it can risk cerebral oedema, hypoglycaemia etc.
  - But for a fetus, it is more theoretical risk, as it is very likely the SAGM will be diluted out / washed away by the placenta. SAGM blood has been used for exchange transfusion rarely (in urgent need, when rare blood only available in SAGM), successfully and without problems.
- Hct:
  - Less concentrated in LVT – so **even less rise in Hb** would be expected, from the limited volume of blood the fetus can take! Not ideal....need to ↑ Hb to cure the hydrops, to reduce the level of risk of fetal death.

# Clinical Discussion:

- D/W Fetal Medicine Consultant – re: error and 2 potential risks to fetus;
- Asked how was the baby?
  - Fetus was still hydropic;
  - At IUT: Pre-Tx Hb had been in 40's g/L; gave some transfusion with difficulty (lie of placenta, small fetus etc) – so unable to give more Tx. Post-Tx Hb was in 70's g/L.
- Felt although the Hct of LVT was lower than ideal, the procedure was more hampered by problems with lie of the fetus etc than by the low Hct.
- Would need another IUT in 1 week anyway.
- He noted that “as hydropic babies have poorer outcomes in terms of significant mortality with IUT, than non-hydropic fetuses – he would **not** have delayed the IUT further until another unit was found, had the error been noticed before the procedure”.



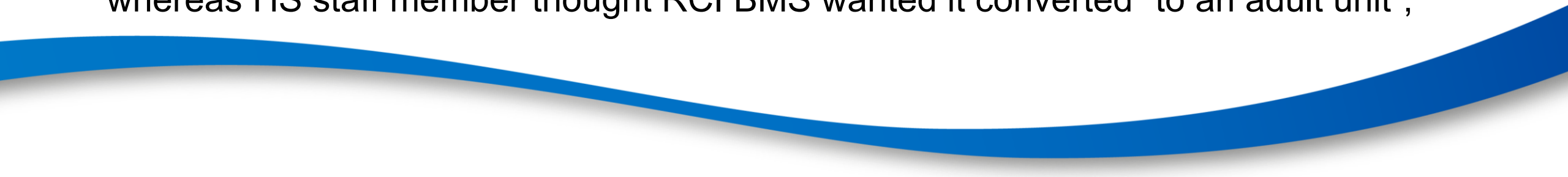
# Outcome:

- 1 week later (after LVT transfusion), hydrops had largely resolved;
- The next IUT was given successfully & all hydrops resolved after that;
- Further IUTs were needed approx. monthly until:
- Delivered at 34 weeks – baby was okay. No exchange transfusion for HDN needed (bilirubin okay) – but just needed top-up Tx at 48 hours after birth. Nil since.





# RCA: How Did the Error Occur?

- RCI BMS knew needed IUT specification – referred to DAT 575/4, to confirm what the criteria were;
  - Searched in PULSE, to id suitable unit, for:
    - rr K- / CMV- / HbS- / HEV- / HT- / PANTS- / <5 days old;
    - That would bring up **both exchange** units (which make into IUT) **and LVT** units;
    - Unit selected was an LVT unit;
  - Hospital Services staff helped RCI BMS with printout, to locate the LVT unit, but not aware it was needed for IUT;
  - HS said the unit “could be converted” – but RCI BMS thought he meant to an IUT, whereas HS staff member thought RCI BMS wanted it converted “to an adult unit”;
- 

# How Did the Error Occur – cont.



- RCI completed cross-match on the unit;
- Hospital does not order the unit on OBOS, as OBOS can't handle RCI cross-matches – awaiting IT development;
- So RCI BMS believed they had cross-matched a unit which would be converted to an IUT. So form was completed assuming that; and both form and unit were taken to Hospital Services.
- HS staff failed to notice IUT specification on the form: issued the unit to hospital.....
- Linda Chapple (ICHNT) developed a poster: hospital staff to recognise the different components, as well.

# INTRA UTERINE UNIT REQUIREMENTS : WHAT IT LOOKS LIKE

macopha G072 418 380 716 R  
Maco Pharma - Pl.  
59 420 Mouni  
CE 0459

RED CELLS FOR INTRA – UTERINE  
TRANSFUSION, LD, IRRADIATED  
STORE AT 4°C ± 2°C

D C E c e  
- - - + +  
HbS Neg, CMV Neg.

Exp Time 21:11  
NHSBT – Colindale  
Date Bled: 30 Jul 2018

REF 2MAFQE6283LB 2

RAD-SURE™ OPERATOR: SA DATE 02.08.18

25 Gy INDICATOR IRRADIATED  
Lot No: 0325320U25  
Exp. JAN 2021

Effective: 02/01/15

FRM111/3  
IUT RED CELLS

Donation Number G072 418 380 716 R  
Haematocrit L/L 0.783  
Hb g/unit 63.18 Hb(g/L) 260  
Signature [Signature]  
Date 02/08/18  
Cross-Referenced in Primary Document: SOP177

PRESERVED IN CPD  
CITRATE PHOSPHATE DEXTROSE

IT SAYS WHAT ITS FOR: IUT

D- C- E- HbS NEG CMV NEG

IT EXPIRES IN 24 HOURS BECAUSE THE  
PACK HAS TO BE PROCESSED TO  
INCREASE THE HAEMATOCRIT

IRRADIATED

THE HAEMATOCRIT IS USED TO  
CALCULATE THE VOLUME OF RED CELLS  
REQUIRED FOR TRANSFUSION

# Conclusion:

- Do occasionally use different components, in emergency e.g. rare blood required, where the balance of risks needs it.
  - But ideally avoid erroneous issue.
  - Multiple CAPAs, but includes staff to be familiar with different components.
- 