

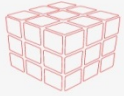


Obstetric cell salvage New developments

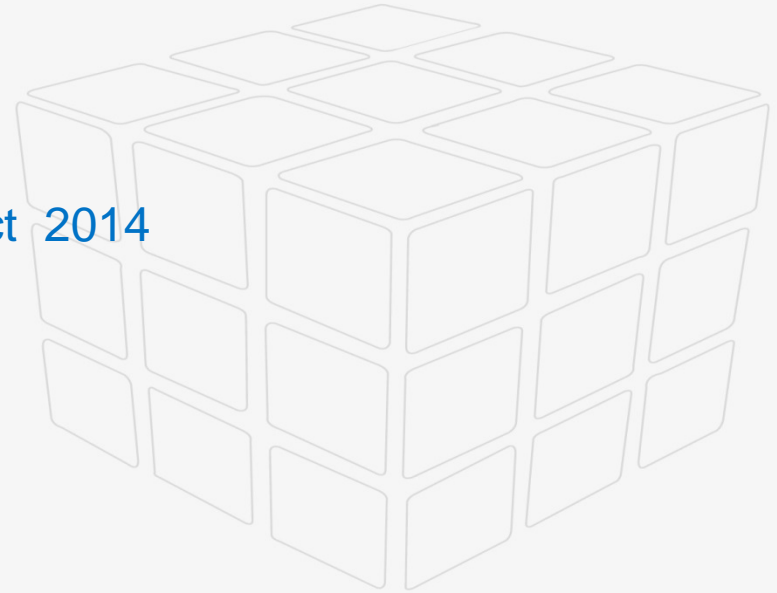
Dr Catherine Ralph

Consultant Anaesthetist – Blood conservation lead
Royal Cornwall Hospital , Truro, Cornwall .





Conflicts of interest :
I have received an honorarium from
Heamonetics to deliver a lecture Oct 2014



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ICS in maternity from 2011

- Routine collection of blood to cell saver- not targeted to high risk cases
- Usage increased to over 90% by end 2011, 95% 2012, 96% 2013 and >98% from 2014
- Competency based training for all anaesthetic assistants
- Blood processed in 1/3rd all collections and only when adequate volumes collected
- Re-infusions offered to all women
- Invited for 4 - 6 month follow up

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Risks and benefits

RISKS

- Amniotic fluid embolism
- Fetal red cell contamination and risk of alloimmunisation

BENEFITS

- Autologous blood
- Avoid or reduce allogeneic blood consumption

Alloimmunisation

- Fetal red cell contamination in cell salvage blood
- Transplacental haemorrhages result in maternal contamination
- Clinically significant antibodies other than anti-D
- Incidence of antibody formation unknown
- Follow up 4-6 months post re-infusion

Outcomes

- Ethics approved study concluded in Sept 2010 . Published BJA Sept 2011
- Since Oct 2010 ICS usage continuously monitored
- Usage increased from 55% to >98% in 2014
- 2 years data 2012/13 - 271 women have received a re-infusion (mean vol 265mls)
- More units blood saved with fewer women, receiving less
- Re-infusions mostly administered through a leucodepletion filter without adverse clinical signs
- 10 of 271 women had allogeneic blood in addition

Results 2013

- Service established as routine
- 805/848 = 95% cases had blood collected
- 28% processed (226 cases)
- 151 women were re-infused (67% of processed collections)
- Mean volume 262 mls (range 111mls- 1066mls)
- 4 women had allogeneic blood in addition
- Follow up to 2016 indicates we do not increase new Ab formation

Results 2014- what went wrong?

- Service established as routine
- 853/869 = 98% cases had blood collected
- 32% processed (277 cases)
- 142 women were re-infused (51% of processed collections)
- Mean volume unchanged
- 10 women had allogeneic blood in addition

Transfusion/ICS rates

	2007	2008	2009	2010	2011	2012	2013	2014
Total obstetric patients – allogeneic tx's	60	79	64	59	58	48	39	54
Del Suite patients – allogeneic tx's	46	58	43	44	40	35	31	39
ICS cases	9	20	25	34	79	120	151	142

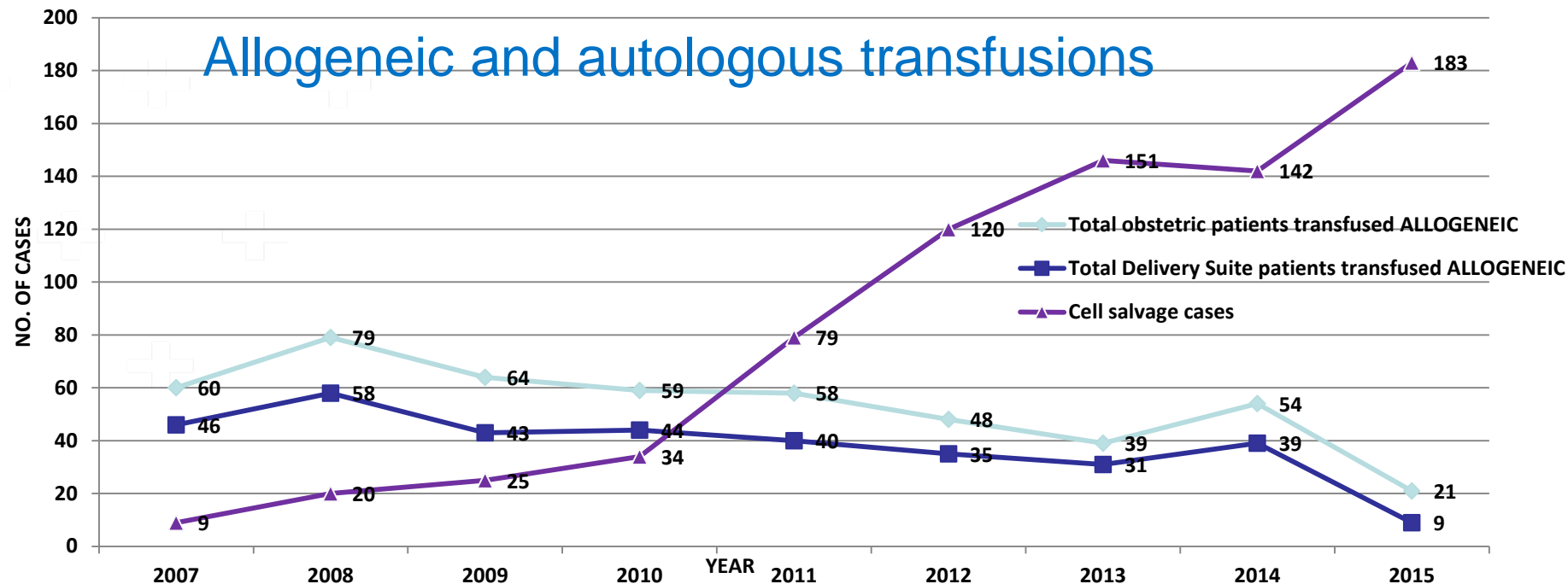
2014 Transfusion audit – summary

- 26% RBC Tx deemed inappropriate
- Second unit transfused over threshold (70g/L) in 39% cases

Blood Product	Appropriate	Inappropriate	Unclear
RBC	51	25	18
FFP	16	10	4
Platelets	1	1	0
Cryoprecipitate	4	0	0

	2008	2009	2010	2011	2012	2013	2014	2015
Total obstetric patients transfused allogeneic blood	79	64	59	58	48	39	54	21
Total no. allogeneic units transfused	259	192	155	167	100	75	112	31
Intra-partum allogeneic transfusions	58	43	44	40	35	31	39	17
ICS re-infusions	20	25	34	79	120	151	146	182
No. deliveries	4349	4354	4428	4688	4628	4612	4388	4316
Allogeneic Tx per delivery (%)	1.8	1.5	1.3	1.2	1.0	0.8	1.2	0.5

Allogeneic and autologous transfusions



Cost benefit of ICS in Obstetrics

- Reduction in Tx rate seen from 2008. Blood saved 2012/13 = 373 units = £23,300 pa
- Cost consumables (processing) = £11,300pa.
Cost saving £12,000 pa
- Partial bowls – use of LDF – reduce costs further
- Reduction in costs of producing blood and treatment ATR
- Reduction in post operative infections, readmissions and potentially LOS
- Future....less risk of exposure to mothers of infection from emerging pathogens

Cell salvage blood

Emergency
C section

N=55

Allogeneic blood

6 C-section
& 30 vaginal
delvieries

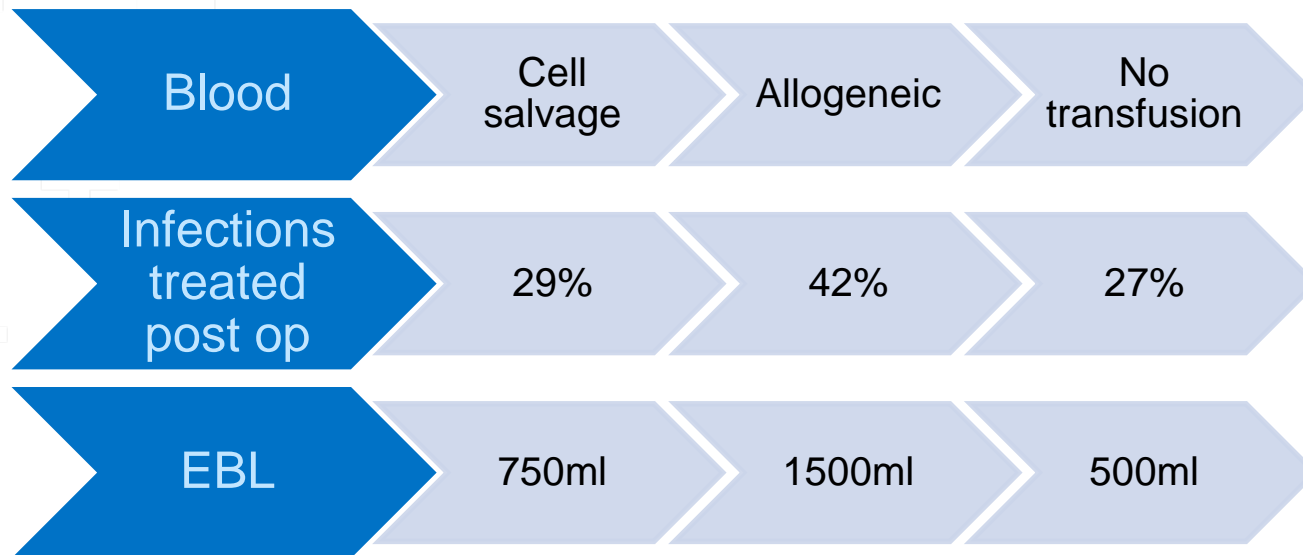
N=36

Not transfused

>500ml blood
loss &
C-Section

N=67

Treated for infection



Increased infection with allogeneic blood

Limitations of cell salvage



Delivery method

- Of the 87 (48+39) women receiving an allogeneic blood transfusion in 2012,13
- 67 (36+31) were vaginal delivery*=75% and 79%
- 2014 68% (37/54)
- 2015 95% (20/21)

(* Assumed vaginal delivery as not on C/section database)

Vaginal blood loss

- Chances of having a blood Tx greater following vaginal delivery
- Why not salvage this blood?
- Can we collect it?
- Is it contaminated?
- NIAA research grant

Is cell salvaged vaginal blood loss suitable for re-infusion?

- Blood lost vaginally can be salvaged in useful volumes.
- Following washing, collected blood is similar to blood re infused after C/S (Hb, haemolysis and efficiency of washout for amniotic fluid and heparin).
- Fetal red cells are present in similar quantities to that seen in the maternal circulation following C/S.
- Washing reduces the quantity of bacteria.

EDITORIAL- IJOA Wilson Wrench 2015

Cell salvage for vaginal delivery-is it time we considered it?

“The thing that hath been, it is that which shall be;
that which is done is that which shall be done: and there
is no new thing under the sun” [Ecclesiastes 1:9 KJV]

The first published use of red blood cell salvage and autologous transfusion was in postpartum haemorrhage (PPH) in 1818.¹ James Blundell, an obstetrician, physiologist and pioneer of transfusion therapy, who had studied under Sir Astley Cooper, described washing blood-soaked swabs in saline and re-infusing the suspension in cases of life-threatening PPH.

.....This research area holds substantial promise for real benefit to women in childbirth and we urge those already engaged in this practice to conduct studies with methodology sufficiently rigorous to allow an objective consideration of wholesale change.

.....

Conclusions

The present

- The routine use of ICS in the maternity operating theatre is part of RCHT's blood conservation strategy.
- Autologous blood is a suitable and safe alternative to allogeneic blood.
- Using autologous blood has reduced the number of units used and % women who have received donor blood.
- Using ICS routinely in maternity saves money

Conclusions

The future

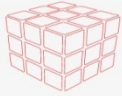
- Establish the incidence of antibody formation following re-infusions from ICS.
- Consider using partial bowls and role of LDF
- ?Salvage and re-infuse vaginal blood

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John Faulds - Blood conservation co-ordinator

Carol McGovern- Blood conservation practitioner

References

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