Patient Blood Management approach of a pregnant woman with Anti- Lutheran B

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Patient Background

- 32 yo Pregnant Woman
- Middle Eastern Background
- Anti-Lu^b detected in first pregnancy
- Patient Phenotype:
  - A Pos, R_1R_1, K Neg, Jk^a Neg, Fy^a Neg, S Neg, Lu^b Neg.

DOB	Delivery Type	Gestation (week)	Estimated Blood Loss (mL)	Complications
2004	Normal Vaginal Induced	40	1000	PPH
2005	Normal Vaginal Induced	41		
2008	Normal Vaginal Induced	41.3	450	
2012	Normal Vaginal Induced	40	150	

Risk of Blood Loss in this delivery?

- Grand Multi-parity (Four or more pregnancies)
- Previous PPH history (Major PPH at 2004 & boundary of PPH at 2008)
- Iron Deficiency Anaemia (Ferritin: 6 µg/L at week 25)
- Other risk factor? (Bilateral Renal Angiomyolipoma)

Lutheran B

- Chromosome --- located on the long arm of chromosome 19
- High Incidence Antigen – 99.8% antigen positive in Caucasians
- Anti Lu^b --- IgG (Mainly IgG1, may also be IgM and IgA)
- Stimulation --- by pregnancy or previous transfusion (no cases of naturally occurring)
- No or Mild HDFN (Antigen not developed/Antibodies absorbed by placental cells)
- Can cause delayed haemolytic transfusion reaction

Clinically significant Antibody!!

GRIFOLS

Perfect Panel

Product Code	Lot No:	Expiry Date:
904114	16801.01	09.05.16
904125	16801.01	09.05.16
904114L	16801.01	09.05.16
904125L	16801.01	09.05.16
904114T	16801.01	09.05.16

Name: E-H
UR Number:
Blood Group: A Pos D.O.B:
Interpretation: Known Anti-Lu^b
Phenotype: Date Tested: ~~1/5/16~~ 29/3/16.
Tests Completed by:

Lot No	Donor No	Rh Type	No	Rh						Kell				Duffy		Kidd		MNSs				P	Lewis		Lutheran		Co		Extra Cell Types				Cell	Results		
				D	C	c	E	e	C^w	K	k	Kp^a	Kp^b	Fy^a	Fy^b	Jk^a	Jk^b	M	N	S	s	P1	Le^a	Le^b	Lu^a	Lu^b	Co^a	Co^b	Wr^a	Vel	Bg^a	Bg^b				
16801.01	AR148	R_1R_1	1	+	+	0	0	+	0	0	+	0	+	+	0	+	0	+	0	+	0	0	0	+	0	+		0	0	+	0	0	1	3	2	
16801.01	AR145	R_1R_1	2	+	+	0	0	+	0	+	0	0	+	0	+	+	0	+	0	+	+	0	+	0	+		0	0	+	+	0	2	3	1	
16801.01	AR003	$R_1^wR_1$	3	+	+	0	0	+	+	0	+	0	+	+	+	0	+	0	+	0	+	+	+	0	0	+		0	0	+	0	0	3	3	1	
16801.01	AR186	R_2R_2	4	+	0	+	+	0	0	0	+	0	+	0	+	+	0	+	0	+	+	+	0	+	0	+		0	0	+	0	0	4	3	1	
16801.01	AR189	R_2R_2	5	+	0	+	+	0	0	0	+	0	+	+	0	0	+	0	+	0	+	+	0	+	0	+		0	0	+	0	0	5	3	1	
16801.01	AR154	r'r	6	0	+	+	0	+	0	0	+	0	+	0	+	0	+	+	0	+	+	0	0	0	0	+		0	0	+	0	0	6	3	1	
16801.01	AR224	r''r	7	0	0	+	+	+	0	0	+	0	+	+	0	+	+	0	+	+	.0	0	0	+	0	+		0	0	NT	0	0	7	3	0	
16801.01	AR155	rr	8	0	0	+	0	+	0	+	+	0	+	+	+	0	+	0	+	+	0	+	0	+	0	+		0	0	+	0	0	8	3	2	
16801.01	AR153	rr	9	0	0	+	0	+	0	0	+	0	+	0	+	0	+	0	+	0	+	+	0	+	+	+		+	0	+	0	0	9	3	2	
16801.01	AR156	rr	10	0	0	+	0	+	0	+	+	0	+	+	0	+	0	+	0	0	+	0	+	0	0	+	+	+	0	+	0	0	10	3	1	
16801.01	AR149	rr	11	0	0	+	0	+	0	0	+	+	+	+	+	+	0	+	+	+	+	+	+	0	0	+		0	0	+	0	0	11	3	1	
	Auto																																	0	0	

Perfect Screen	1	
	2	
	3	

Please note: Co^a typings not done on all donations as insufficient anti-Co^a antisera available.

Grifols Australia Pty Ltd 5/80 Fairbank Rd, Clayton South, VIC 3169

(Sample sent to ARCBS 29 30/3/16

Antibody panel at week 29

Dilemma:

- Very difficult to obtain phenotype matched units --- 2 Lu^b Negative donors in Australia
- Risk of sensitizing the patient with other Antibodies involved in HTR/HDFN

Patient Phenotype	HDFN	HTR	% Compatible	Combined % Compatible
Compatible Group (A/O)	Y	Y	29.7 (A_1) + 9.3 (A_2) + 46.1 (O) = 85.1	0.51
c/E (R_1R_1)	Y	Y	17.68	
K	Y	Y	90.9	
Fy^a	Y	Y	32.7	
Jk^a	N	Y	23.6	
S	Y	Y	48	
Lu^b	No-Mild	N	0.02	0.010

Major Blood Group Phenotypes and their Frequencies
www.transfusion.com.au last updated 26/8/16.

Management of patient

- **Multidisciplinary team**
  - **GP**
  - **Obstetrician**
  - **Renal Specialist**
  - **Haematologist**

- **2x Standby unit at RPAH: R_1R_1, K Neg, Fya Neg, Jka Neg, S Neg**
- **2x Lu^b negative on hold at Red Cross**
- **Organized patient for iron infusion**
  - **Ferriject 1g x 2**

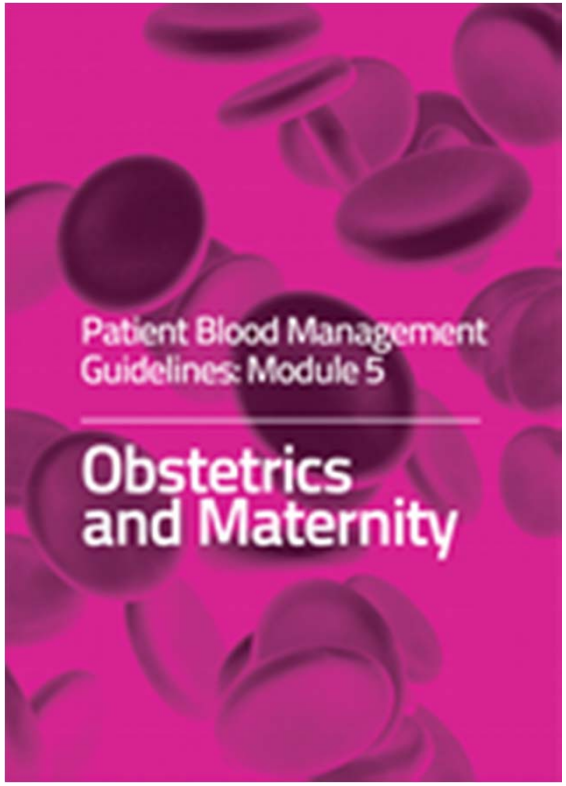
	Week 25	Week 40
Ferritin [20-300µg/L]	6 µg/L	807µg/L
Hb [120-150µmol/L]	105 µmol/L	123 µmol/L

Final Outcome

- Baby born 22/6/16
  - Group A positive with negative DAT and negative Antibodies Screen
- Patient eventually have blood loss of 800mL due to Labial Graze/Tear however no blood was needed (Hb103g/L Asymptomatic)
- Baby and Parents discharged after 3 days (25/6/16)

Patient Blood Management Guidelines: Module 5

- Three pillars
  - Optimisation of Blood Volume and Red Cell Mass
  - Minimisation of Blood Loss
  - Optimisation of the patient's tolerance of anaemia



4.4 Care of patients in whom transfusion is not an option

EXPERT OPINION POINTS – care of patients in whom transfusion is not an option	
EOP16	In all maternity patients, it is good clinical practice to optimise Hb during the antenatal period, minimise blood loss during birth and, in the event of haemorrhage, secure haemostasis as a matter of urgency. This is vital in patients for whom transfusion is not an option.
EOP17	To arrest significant and life-threatening haemorrhage, when transfusion is not an option, the definitive procedure to minimise ongoing blood loss is hysterectomy, which must be considered and acted upon early.
EOP18	Early identification of women for whom transfusion is not an option is vital, to enable a comprehensive multidisciplinary plan to be developed and implemented.

EOP, expert opinion point; Hb, haemoglobin

*Patient Blood Management Guidelines: Module 5 – Obstetrics and Maternity 2015

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National Blood Authority. 2015. Patient Blood Management Guidelines: Module 5 – Obstetrics and Maternity.

Appendix A: Haemoglobin/Iron changes in this Pregancy

Gestation	Date	IV Iron Infusion Ferriject 1g)	Hb	Ferritin (20-300 ug/L)	Iron (10-30 umol/L)	Serum Folate (8-25 nmol/L)
22	10/02/2016		113	11	9	27.3
25	4/03/2016		105	6		
		11/04/2016				
35	17/05/2016		112			
		17/05/2016		168	17	
37	31/05/2016		113			
40	21/06/2016		123	807	44	
after giving birth						
------	22/06/2016		113			
------	23/06/2016		103			
------	24/06/2016		107			

Appendix B: Effect of Maternal Ferritin Level vs Hb level after Iron infusion