



Uneasy A

A Tale of
4 Patients

RBWH Blood Bank

A Little bit of Background:

- Separate from main lab - located next to theatres and ICU
- Reference Laboratory for Pathology Queensland
- 18 Staff Members covering 24/7 Roster
- Mon-Fri one person each day is dedicated to "Special" Investigations





“Uneasy A”

4 Patients with Unexpected reactions with A1 Reverse Cells



A1 Reverse Cells

Pooled suspension of Rh(D) negative A1 donor red cells

Apart from A1 antigen, display a combination of red cell antigens

Anti-A1 occurs in approx 2% of Group A2 sera, and 20% of A2B sera

Unexpected antibodies in the plasma may cause discrepancies between forward and reverse group – these discrepancies **must** be investigated

Patient 1

- Presented to Emergency Department ?NOF
- Initial Results: Positive Ab Screen, MF reaction with A1 cells
- History: Transfused 5 x A pos PRBC 2009

BLOOD GROUP	Anti A	Anti B	Anti D	Cont	A1 Cell	B Cell	Group
		4	0	4	0	MF	4

AB SCR	Cell I	Cell II	Cell III	Screen
		0	0	3

Cell No	Reference No	RH						KEL			FY		JK		MNS				P1PK		LE		LU	CO	Additional Typings	Cell No	Results			
		Rh Phen.	D	C	E	c	e	C ^w	K	k	Kp ^a	Fy ^a	Fy ^b	Jk ^a	Jk ^b	M	N	S	s	P1	Le ^a	Le ^b	Lu ^a	Co ^b			IAT	RT		
1	2188733	R ₁ R ₁	+	+	0	0	+	+	0	+	0	+	+	0	+	+	+	+	+	+	0	+	0	0		1	3	0		
2	5115543	R ₁ R ₁	+	+	0	0	+	0	+	+	0	0	+	+	0	+	0	+	0	+	+	0	0	0		2	3	4		
3	2028091	R ₁ R ₁	+	+	0	0	+	0	0	+	0	+	0	0	+	0	+	0	+	0	+	0	0	0	Sd (a+)	3	3	0		
4	4834604	R ₂ R ₂	+	0	+	+	0	0	0	+	0	+	0	0	+	+	+	0	+	+ ^w	+	0	0	0		4	3	0		
5	2148377	R ₂ R ₂	+	0	+	+	0	0	0	+	0	0	+	0	+	0	+	0	+	+	0	+	0	+		5	0	0		
6	4509294	r'r	0	+	0	+	+	0	0	+	0	0	+	0	+	+	+	0	+	0	0	+	0	0		6	0	0		
7	2104117	r'r	0	0	+	+	+	0	0	+	0	+	+	0	+	0	+	+	+	+	+	0	0	0		7	3	0		
8	4086345	rr	0	0	0	+	+	0	+	+	0	+	0	0	+	0	+	0	+	0	0	+	0	0		8	3	4		
9	2112286	rr	0	0	0	+	+	0	0	+	0	0	+	0	+	0	+	0	+	0	+	0	0	0		9	0	0		
10	2053152	rr	0	0	0	+	+	0	0	+	0	+	+	+	0	0	+	0	+	0	0	0	0	0		10	3	0		
11	2056256	rr	0	0	0	+	+	0	0	+	0	0	+	+	0	+	+	+	+	+	0	+	0	0		11	0	0		
Auto																									Auto	0	0			
	Reference No																									Reference No				
	Ab1																									Ab1				
	Ab2																									Ab2				
	Ab3																									Ab3				
		Rh Phen.	D	C	E	c	e	C ^w	K	k	Kp ^a	Fy ^a	Fy ^b	Jk ^a	Jk ^b	M	N	S	s	P1	Le ^a	Le ^b	Lu ^a	Co ^b		Cord				
																											A ₁		MF	
																											A ₂			
																											B		4	

This product is manufactured from blood donated by voluntary donors to the Australian Red Cross Blood Service (ARCBS).

Note: Cells 6, 7 and 8 form the RhD Negative Screening Cell Subset, formulated for antenatal RhD antibody screening in the presence of Prophylactic Anti-D.

Sd^a: Strong expression (Ref: Reid M.E., Lomas-Francis C., Olsson M.L., "The Blood Group Antigen FactsBook", 3rd Edition Pgs. 685-687).

- Patient Phenotype: A1
- Panel Results: Anti Fya, Anti K
- RT Panel Results: Anti K
- MF reaction with A1 cells due to Anti-K

Patient 2

- Preop THR.
- No transfusion history, negative antibody screen
- Patient types as A1 positive

BLOOD GROUP	Anti A	Anti B	Anti D	Cont	A1 Cell	B Cell	Group
	4	0	4	0	2	4	A Rh(D) POSITIVE

AB SCR	Cell I	Cell II	Cell III	Screen
	0	0	0	Negative

Cell No	Reference No	RH							KEL			FY		JK		MNS				PIPK		LE		LU		CO		Additional Typings	Cell No	Results		
		Rh Phen.	D	C	E	c	e	C ⁺	K	k	Kp ^a	Fy ^a	Fy ^b	Jk ^a	Jk ^b	M	N	S	s	P1	Le ^a	Le ^b	Lu ^a	Co ^b	iAT	RT	4 ^o					
1	2188733	R ₁ ⁺ R ₁	+	+	0	0	+	+	0	+	0	+	+	0	+	+	+	+	+	+	0	+	0	0		1		0	0			
2	5115543	R ₁ R ₁	+	+	0	0	+	0	+	+	0	0	+	0	+	0	+	0	+	+	0	0	0	0		2		0	2			
3	2028091	R ₁ R ₁	+	+	0	0	+	0	0	+	0	+	0	0	+	0	+	0	+	0	+	0	0	0	Sd (a+)	3		0	0			
4	4834804	R ₂ R ₂	+	0	+	+	0	0	0	+	0	+	0	0	+	+	+	0	+	+	+	0	0	0		4		0	0			
5	2148377	R ₂ R ₂	+	0	+	+	0	0	0	+	0	0	+	0	+	0	+	0	+	+	+	0	0	+		5		0	0			
6	4509294	rr	0	+	0	+	+	0	0	+	0	0	+	+	+	0	+	0	0	0	0	+	0	0		6		0	1			
7	2104117	rr	0	0	+	+	+	0	0	+	0	+	+	0	+	0	+	+	+	+	+	0	0	0		7		1	0			
8	4086345	rr	0	0	0	+	+	0	+	+	0	+	0	0	+	0	+	0	+	0	0	0	+	0		8		0	0			
9	2112286	rr	0	0	0	+	+	0	0	+	0	0	+	0	+	0	+	0	+	0	+	0	0	0		9		0	2			
10	2053152	rr	0	0	0	+	+	0	0	+	0	+	+	+	0	0	+	0	0	0	0	0	0	0		10		0	1			
11	2056256	rr	0	0	0	+	+	0	0	+	0	0	+	0	+	+	+	+	+	+	0	+	0	0		11		0	0			
Auto																									Auto							
Reference No																									Reference No							
Ab1																									Ab1	0						
Ab2																									Ab2	0						
Ab3																									Ab3	0						
		Rh Phen.	D	C	E	c	e	C ⁺	K	k	Kp ^a	Fy ^a	Fy ^b	Jk ^a	Jk ^b	M	N	S	s	P1	Le ^a	Le ^b	Lu ^a	Co ^b	Cord							
		This product is manufactured from blood donated by voluntary donors to the Australian Red Cross Blood Service (ARCBS).																									A ₁		2			
		Note: Cells 6, 7 and 8 form the RhD Negative Screening Cell Subset, formulated for antenatal RhD antibody screening in the presence of Prophylactic Anti-D.																									A ₂		0			
		Sd ^a : Strong expression (Ref: Reid M.E., Lomas-Francis C., Olsson M.L., 'The Blood Group Antigen FactsBook', 3rd Edition Pgs. 685-687).																									B		4			

- RT Panel, reaction in 1 cell only
- Panel performed at 4 degrees – positive reactions with M+ cells
- **BUT** phenotype performed – patient M positive
- ? Super M (M1) - ? M-like antibody

Patient 3

- 11 year old presented to ED - ? Necrotising fasciitis
- Group AB pos.
- Negative Antibody Screen.
- Given 2 x O pos pRBCs
- 2 large doses of Intragam 10 given over 2 days (80g and 40g)

Patient 3

Pre-op sample 72 hours later:

BLOOD GROUP	Anti A	Anti B	Anti D	Cont	A1 Cell	B Cell	Group
	MF	MF	4	0	2	0	AB Rh(D) POSITIVE

AB SCR	Cell I	Cell II	Cell III	Screen
	0	0	0	Negative

IgG	C3d	Direct AHG
1	0	Positive (IgG)

Plasma	Rev 3%	249787	10817	RT Tube	2	0				
Plasma	Ab scr	2245239	10817	15m RT IAT	0	0	0			
Eluate	CSL	2245239	100817	Diamed IAT	0	0	0			
Eluate		A1,A2		Diamed IAT	0	0				
Plasma	Rev 3%	A1,A2		RT Tube	4	wk				
Plasma		3x A1, 3x A2		Diamed IAT	2	2	2	0	0	0

- Patient phenotype A1 Neg – Note only O pos Red Cells given
- Weakly positive DAT
- No antibodies eluted off red cells
- Reactions moderate to strong with A1 cells at RT and 37, negative to weak with A2 cells

Likely Cause:



Large dose of Intragam 10

- Pooled plasma from approx 1000 donors
- Can contain blood group antibodies which can coat red cells with immunoglobulin, causing a positive DAT, and rarely haemolysis (maximum isoagglutinin titre 1:64)
- Patients at increased risk of haemolysis are group A, B or AB, have an underlying associated inflammatory condition, and have received a high dose of IvIG

Points to Note:

- no Anti-A was eluted from the red cells ? Due to less binding sites on the red cells
- IAT showed little to no reaction with A2 cells, stronger with A1 cells
- no haemolysis noted in patient

? Was being A1 negative advantageous to the patient?

Patient 4

- Presented to ED with perforated colon, 2 units blood requested
- Patient A pos with Anti C , anti e
- Patient given 8 FFP and 1 unit PC over next week. No change in results.

BLOOD GROUP	Anti A	Anti B	Anti D	Cont	A1 Cell	B Cell	Group
	4	0	4	0	0	4	A Rh(D) POSITIVE

AB SCR	Cell I	Cell II	Cell III	Screen
	2	0	1	POSITIVE

Sample Expiry: 04:50 22-Mar-14 ID: mts3 Location No : ### No
Antibody ID: 1. Anti C 2. Anti e
3. 4.

Patient 4 – Fortnight later

- 2 apheresis platelets and 2 FFP given
- 4 days later Preop GPH Requested
- Note: Reaction with A1 cells, increase in screen reaction strength

BLOOD GROUP	Anti A	Anti B	Anti D	Cont	A1 Cell	B Cell	Group
	4	0	4	0	2	4	A Rh(D) POSITIVE

AB SCR	Cell I	Cell II	Cell III	Screen
	4	0	4	POSITIVE

Sample Expiry: 04:30 29-Mar-14 ID: nf2 Location No : ### No
Antibody ID: 1. Anti C 2. Anti e
3. 4.

Cell No	Reference No	RH								KEL			FY		JK		MNS				P1PK	LE		LU	CO	Additional Typings	Cell No	Results		
		Rh Phen.	D	C	E	c	e	C ^w	K	k	Kp ^a	Fy ^a	Fy ^b	Jk ^a	Jk ^b	M	N	S	s	P1	Le ^a	Le ^b	Lu ^a	Co ^b	INT			RT		
1	2155461	R ₁ ^w R ₁	+	+	0	0	+	+	0	+	0	+	0	0	+	0	+	0	+	+	0	+	0	0		1	4	4		
2	2082365	R ₁ R ₁	+	+	0	0	+	0	+	0	0	+	0	+	+	+	+	+	+	+	0	+	0	0		2	4	4		
3	2005814	R ₁ R ₁	+	+	0	0	+	0	0	+	0	+	+	+	+	0	+	0	+	+	0	+	0	0		3	4	4		
4	2002472	R ₂ R ₂	+	0	+	+	0	0	0	+	0	+	+	0	0	+	0	+	+	+	0	+	0	0		4	0	0		
5	2225221	R ₂ R ₂	+	0	+	+	0	0	0	+	0	+	+	0	+	+	0	+	+	0	0	+	0	0		5	0	0		
6	2054262	r'r	0	+	0	+	+	0	0	+	0	+	0	+	0	+	0	+	+	+	0	0	0	0		6	4	4		
7	2153629	r'r	0	0	+	+	+	0	0	+	0	+	+	0	+	0	+	0	+	+	0	+	0	0		7	3	4		
8	5129785	rr	0	0	0	+	+	0	+	+	0	+	+	0	+	0	+	0	0	0	0	+	0	0		8	3	4		
9	2056708	rr	0	0	0	+	+	0	0	+	0	+	+	0	+	0	0	+	+	0	0	0	0	0		9	3	4		
10	2284858	rr	0	0	0	+	+	0	0	+	0	+	+	0	0	+	+	+	0	0	0	+	0	0		10	3	4		
11	1341185	rr	0	0	0	+	+	0	0	+	+	0	+	0	+	+	+	0	+	+	0	+	0	0	Yt(b+)	11	3	4		
Auto																									Auto	0	0			
	Reference No																									Reference No				
	Ab1																									Ab1	4	4		
	Ab2																									Ab2	0	0		
	Ab3																									Ab3	4	4		
		Rh Phen.	D	C	E	c	e	C ^w	K	k	Kp ^a	Fy ^a	Fy ^b	Jk ^a	Jk ^b	M	N	S	s	P1	Le ^a	Le ^b	Lu ^a	Co ^b	Cord					
																											R ₂ R ₂	A ₁	0	4
																											R ₂ R ₂	A ₂	0	0
																											B			

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Note: Cells 6, 7 and 8 form the RhD Negative Screening Cell Subset, formulated for antenatal RhD antibody screening in the presence of Prophylactic Anti-D.

Yt^a: A low incidence antigen (Ref: Reid M.E., Lomas-Francis C., Olsson M.L., "The Blood Group Antigen FactsBook", 3rd Edition Pgs. 419-420).

- RT panel – anti e present ? Cause of reaction with A1 cells (rr)

BUT

- patient phenotype A1 neg
- R2R2 A1 and A2 cells tested
- Anti A1 also present - reacting at RT only



Un
easy A