

**INDIAN IMMUNOHEMATOLOGY INITIATIVE**  
**CASE OF THE MONTH: May 2008**  
**Case Study by Jan Hamilton MT(ASCP)SBB (©2009)**

**History:** This patient was a 65 year old Indian woman with iron deficiency anemia. She had been married to a British businessman working in New Delhi and remained there following his death. Her history includes 4 pregnancies and several transfusions. Her last transfusion was 7 months ago. Because her current hemoglobin is 7.1 gm/dl, two units of red cells have been ordered for transfusion.

**Pretransfusion testing – first transfusion**

**ABO and Rh Typing**

Anti-A	Anti-B	A1 cells	B cells	6% alb	Anti-D	Anti-D/AHG	CCC	Interp
0	0	4+	4+		4+			O pos

**Antibody detection test (screen); gel column agglutination technique**

Lot #VS169		Rh system						Kell						Duffy		Kidd	Xg	Lewis		MNSs				P	Lutheran		Other					
Cell	Rh	D	C	E	c	e	V	K	k	Kp <sup>a</sup>	Kp <sup>b</sup>	Js <sup>a</sup>	Js <sup>b</sup>	Fy <sup>a</sup>	Fy <sup>b</sup>	JK <sup>a</sup>	JK <sup>b</sup>	Xg <sup>a</sup>	Le <sup>a</sup>	Le <sup>b</sup>	S	s	M	N	P1	Lu <sup>a</sup>	Lu <sup>b</sup>	Typings	Gel			
OI	R1R1	+	+	0	0	+	0	+	+	0	+	0	+	+	0	+	+	+	0	+	+	+	+	+	+	+s	0	+		2+		
OII	R2R2	+	0	+	+	0	0	0	+	0	+	0	+	+	+	+	0	0	+	0	0	+	0	+	+	+	0	+		0		

**Panel: gel column agglutination technique**

VRA112		Rh system						Kell						Duffy		Kidd	Xg	Lewis		MNSs				P	Lutheran		Other							
Cell	Rh	D	C	E	c	e	V	K	k	Kp <sup>a</sup>	Kp <sup>b</sup>	Js <sup>a</sup>	Js <sup>b</sup>	Fy <sup>a</sup>	Fy <sup>b</sup>	JK <sup>a</sup>	JK <sup>b</sup>	Xg <sup>a</sup>	Le <sup>a</sup>	Le <sup>b</sup>	S	s	M	N	P1	Lu <sup>a</sup>	Lu <sup>b</sup>	Typings	Cell	Gel				
1	R1wR1	+	+	0	0	+	0	0	+	0	+	0	+	0	+	+	+	+	+	0	0	+	0	+	+	+	0	+	C <sup>w</sup>	1	0			
2	R1R1	+	+	0	0	+	0	0	+	0	+	0	+	+	+	+	0	+	+	0	+	0	+	0	+	0	+s	0	+		2	0		
3	R2R2	+	0	+	+	0	0	0	+	0	+	0	+	0	+	+	+	+	0	+	+	+	+	0	+	0	+		3	0				
4	Ror	+	0	0	+	+	+	0	+	0	+	0	+	0	0	+	+	+	0	+	0	+	0	+	+	+	0	+		4	0			
5	r'r	0	+	0	+	+	0	0	+	0	+	0	+	+	0	+	0	0	0	+	0	+	0	+	0	0	0	+		5	0			
6	r''r	0	0	+	+	+	0	0	+	0	+	0	+	+	0	+	0	+	+	0	0	+	+	0	+	0	0	+		6	0			
7	rr	0	0	0	+	+	0	+	+	0	+	0	+	0	+	+	0	0	0	0	0	+	+	+	+	0	0	+		7	2+			
8	rr	0	0	0	+	+	0	0	+	0	+	0	+	0	+	+	+	+	0	+	0	+	0	+	0	0	0	+		8	0			
9	rr	0	0	0	+	+	0	+	+	0	+	0	+	+	0	+	+	+	0	0	+	+	+	0	+	0	+		9	2+				
10	rr	0	0	0	+	+	0	0	+	0	+	0	+	0	+	+	0	+	0	+	0	+	0	+	+	+	+		10	0				
11	R1R1	+	+	0	0	+	0	+	+	0	+	0	+	0	+	+	0	0	+	0	0	+	+	0	+	0	+		11	2+				
Patient																													AC	0				

**Red cell crossmatches**

	<b>Gel</b>
<b>Unit 1</b>	<b>0</b>
<b>Unit 2</b>	<b>0</b>

**Questions:**

1. What is the specificity of the antibody in the patient's sample? Is any other testing required to confirm this specificity?
2. What can be deduced about the crossmatched units from the compatible results?
3. Should any further testing be performed on the units prior to transfusion?

Units 1 and 2 were transfused. The patient's vital signs were monitored during the transfusion and for 1 hour after the transfusion. There were no signs or symptoms of adverse reaction.

The morning following transfusion her hemoglobin had risen to 9.5 gm/dl. She was discharged from the hospital. One week later, she went back to her physician because of a sudden return of fatigue. At that time it was determined that her hemoglobin was 7.6 gm/dl. Her physician again hospitalized her to rule out GI bleeding and ordered two more units for transfusion.

Pretransfusion testing – Second transfusion, one week later

ABO and Rh Typing

Anti-A	Anti-B	A1 cells	B cells	6% alb	Anti-D	Anti-D/AHG	CCC	Interp
0	0	4+	4+		4+			O pos

Antibody detection test (screen); gel column agglutination technique

Lot #VS169		Rh system						Kell						Duffy		Kidd		Xg	Lewis		MNSs				P	Lutheran		Other				
Cell	Rh	D	C	E	c	e	V	K	k	Kp <sup>a</sup>	Kp <sup>b</sup>	Js <sup>a</sup>	Js <sup>b</sup>	Fy <sup>a</sup>	Fy <sup>b</sup>	Jk <sup>a</sup>	Jk <sup>b</sup>	Xg <sup>a</sup>	Le <sup>a</sup>	Le <sup>b</sup>	S	s	M	N	P1	Lu <sup>a</sup>	Lu <sup>b</sup>	Typings	Gel			
OI	R1R1	+	+	0	0	+	0	+	+	0	+	0	+	+	0	+	+	+	0	+	+	+	+	+	+	+s	0	+		2+		
OII	R2R2	+	0	+	+	0	0	0	+	0	+	0	+	+	+	+	0	0	+	0	0	+	0	+	+	+	0	+		1+		

Panel: gel column agglutination technique

VRA112		Rh system						Kell						Duffy		Kidd		Xg	Lewis		MNSs				P	Lutheran		Other					
Cell	Rh	D	C	E	c	e	V	K	k	Kp <sup>a</sup>	Kp <sup>b</sup>	Js <sup>a</sup>	Js <sup>b</sup>	Fy <sup>a</sup>	Fy <sup>b</sup>	Jk <sup>a</sup>	Jk <sup>b</sup>	Xg <sup>a</sup>	Le <sup>a</sup>	Le <sup>b</sup>	S	s	M	N	P1	Lu <sup>a</sup>	Lu <sup>b</sup>	Typings	Cell	Gel			
1	R1wR1	+	+	0	0	+	0	0	+	0	+	0	+	0	+	+	+	+	+	0	0	+	0	+	+	+	0	+	C <sup>w</sup>	1	1+		
2	R1R1	+	+	0	0	+	0	0	+	0	+	0	+	+	+	+	0	+	+	0	+	0	+	0	+	+s	0	+		2	1+		
3	R2R2	+	0	+	+	0	0	0	+	0	+	0	+	0	+	+	+	+	0	+	+	+	+	0	+	0	+		3	0			
4	Ror	+	0	0	+	+	+	0	+	0	+	0	+	0	0	+	+	+	0	+	0	+	0	+	+	0	+		4	1+			
5	r'r	0	+	0	+	+	0	0	+	0	+	0	+	+	0	+	0	0	0	+	0	+	0	+	0	0	+		5	2+			
6	r''r	0	0	+	+	+	0	0	+	0	+	0	+	+	0	+	0	+	+	0	0	+	+	0	+	0	+		6	2+			
7	rr	0	0	0	+	+	0	+	+	0	+	0	+	0	+	+	0	0	0	0	+	+	+	+	0	0	+		7	2+			
8	rr	0	0	0	+	+	0	0	+	0	+	0	+	0	+	+	+	+	0	+	0	+	0	0	0	0	+		8	0			
9	rr	0	0	0	+	+	0	+	+	0	+	0	+	0	+	+	0	0	0	+	+	+	0	+	0	+		9	2+				
10	rr	0	0	0	+	+	0	0	+	0	+	0	+	0	+	+	0	+	0	+	0	+	0	+	+	+	+		10	2+			
11	R1R1	+	+	0	0	+	0	+	+	0	+	0	+	0	+	+	0	0	+	0	0	+	+	0	+	0	+		11	2+			
Patient																													AC	vw+			

vw = very weak

Questions:

4. What probable antibody specificities are now apparent in the patient's sample?

5. Are there some alloantibodies that can't be excluded? What additional testing should be performed?
  
6. What is the likely cause of the patient's drop in hemoglobin? What testing can be done to support this?

The blood bank technician retrieved the retention samples (segments) from Units 1 and 2 that were transfused one week ago. They were crossmatched with the current sample.

**Repeat red cell crossmatches**

	Gel
Unit 1	2+
Unit 2	1+

**Direct Antiglobulin Test – Patient RBC**

Sample	Phase	Poly	Anti-IgG	Anti-C3
Pretransfusion-1	IS	0		
	5 min RT	0		
	CCC	2+		

Sample	Phase	Poly	Anti-IgG	Anti-C3
Pretransfusion -2	IS	vw+	vw +	0
	5 min RT	1+		1+
	CCC			

**Eluate from patient's Pretransfusion -2 sample: gel column agglutination technique**

VRA112		Rh system						Kell						Duffy		Kidd		Xg	Lewis		MNSs					P	Lutheran		Other				
Cell	Rh	D	C	E	c	e	V	K	k	Kp <sup>a</sup>	Kp <sup>b</sup>	Js <sup>a</sup>	Js <sup>b</sup>	Fy <sup>a</sup>	Fy <sup>b</sup>	Jk <sup>a</sup>	Jk <sup>b</sup>	Xg <sup>a</sup>	Le <sup>a</sup>	Le <sup>b</sup>	S	s	M	N	P1	Lu <sup>a</sup>	Lu <sup>b</sup>	Typings	Cell	Gel			
1	R1wR1	+	+	0	0	+	0	0	+	0	+	0	+	0	+	+	+	+	+	0	0	+	0	+	+	0	+	C <sup>w</sup>	1	1+			
2	R1R1	+	+	0	0	+	0	0	+	0	+	0	+	+	+	+	0	+	+	0	+	0	+	0	+s	0	+		2	1+			
3	R2R2	+	0	+	+	0	0	0	+	0	+	0	+	0	+	0	+	+	0	+	+	+	+	0	+	0	+		3	0			
4	Ror	+	0	0	+	+	+	0	+	0	+	0	+	0	0	+	+	+	0	+	0	+	0	+	+	0	+		4	1+			
5	r'r	0	+	0	+	+	0	0	+	0	+	0	+	+	0	+	0	0	0	+	0	+	0	+	0	0	+		5	1+			
6	r''r	0	0	+	+	+	0	0	+	0	+	0	+	+	0	+	0	+	+	0	0	+	+	0	+	0	+		6	1+			
7	rr	0	0	0	+	+	0	+	+	0	+	0	+	0	+	+	0	0	0	0	+	+	+	+	0	0	+		7	1+			
8	rr	0	0	0	+	+	0	0	+	0	+	0	+	0	+	+	+	+	0	+	0	+	0	0	0	+		8	0				
9	rr	0	0	0	+	+	0	+	+	0	+	0	+	+	0	0	+	+	0	0	+	+	+	0	+	0	+		9	0			
10	Rr	0	0	0	+	+	0	0	+	0	+	0	+	0	+	+	0	+	0	+	0	+	0	+	+	+	+		10	1+			
11	R1R1	+	+	0	0	+	0	+	+	0	+	0	+	0	+	+	0	0	+	0	0	+	+	0	+	0	+		11	1+			
Patient																												AC					

**Questions:**

- What antibody was recovered in the eluate from the patient's red cells? Is any further testing required?
- If the patient received two units of incompatible red cells, why are the direct antiglobulin test and eluate reactivity not stronger?
- What would you predict would be the antigen type of the patient and the two transfused units for the antigen in question?

10. Why did the patient's sample change in reactivity in such a short time? Could this have been prevented?
  
11. How might this be prevented in the future?
  
12. How should we now select compatible blood for this patient? What percentage of donors is expected to be compatible?