

e?

f??

Gee whiz!

Lee Ann Prihoda, MEd, MT(ASCP)SBB
Manager, Reference Laboratory
American Red Cross Blood Services
Southern Region

Case History

- 32-year old female admitted for delivery of 4th child (06/2003)
 - No prenatal history at your facility
 - No known transfusions
 - Antibody screen positive (all cells)
 - Referred to Reference Lab for antibody identification
- Baby soon arrives and has positive DAT
 - Slight jaundice is noted
 - Sample is also sent to Reference Lab

Ref Lab Initial Testing

- Mom
 - O, Rh positive
 - DAT negative
 - Phenotype:
 - R2R2, K+k+, Fy(a+b+), Jk(a-b+), S+s+

Ref Lab Initial Testing

- Infant
 - O, Rh positive
 - Direct Antiglobulin Test
 - 1+ (polyspecific and anti-IgG)
 - Phenotype
 - R²r, K-, Fy(a+b-), Jk(a+b+), S+ s-

Initial Panel - Mom

Vial	RhHr						Kell		Duffy		Kidd		Lewis		P	MNSs				IS	37	LISS- IcG
	D	C	c	E	e	f	K	k	Fy a	Fy b	Jk a	Jk b	Le a	Le b	P 1	M	N	S	s			
1	0	+	+	0	+	+	0	+	+	0	+	+	+	0	+	+	0	0	+	0	0	1
2	+	+	0	0	+	0	0	+	+	0	+	+	0	+	0	0	+	0	+	0	0	1
3	+	+	0	0	+	0	+	W	0	+	+	0	0	0	+	+	+	0	+	0	0	1
4	+	0	+	+	0	0	0	+	+	0	0	+	0	+	0	+	+	0	+	0	0	0
5	0	0	+	+	+	+	0	+	+	+	+	0	0	+	+	+	+	0	+	0	0	2
6	0	0	+	0	+	+	0	+	0	0	+	+	0	+	+	0	+	0	+	0	0	2
7	0	0	+	0	+	+	+	+	+	+	0	+	0	+	+	+	+	0	+	0	0	1
8	0	0	+	0	+	+	0	+	0	0	+	+	0	+	+	+	+	0	+	0	0	2
9	0	0	+	0	+	+	0	+	+	0	0	+	0	+	+	0	+	0	+	0	0	1
10	0	+	0	0	+	0	0	+	0	+	+	0	+	0	0	+	0	+	+	0	0	2
11	+	+	+	0	+	+	+	+	+	+	0	+	0	0	+	+	+	+	0	0	0	2
AC	+	0	+	+	0		+	0	+	+	0	+	0	+	+	+	+	+	+	0	0	0

At first glance...

- Only one cell negative on initial panel.
- Autocontrol is negative.
- What do you notice about the one negative cell?
- What else should we do?
- Can you rule out any other specificities?
 - Hint: Look at mom's phenotype. What antigens does she possess?

Initial Panel - Mom

Vial	RhHr						Kell		Duffy		Kidd		Lewis		P	MNSs				IS	37	LISS-IgG
	D	C	c	E	e	f	K	k	Fy _a	Fy _b	Jk _a	Jk _b	Le _a	Le _b	P ₁	M	N	S	s			
1	0	+	+	0	+	+	0	+	+	0	+	+	+	0	+	+	0	0	+	0	0	1
2	+	+	0	0	+	0	0	+	+	0	+	+	0	+	0	0	+	0	+	0	0	1
3	+	+	0	0	+	0	+	W	0	+	+	0	0	0	+	+	+	0	+	0	0	1
4	+	0	+	+	0	0	0	+	+	0	0	+	0	+	0	+	+	0	+	0	0	0
5	0	0	+	+	+	+	0	+	+	+	+	0	0	+	+	+	+	0	+	0	0	2
6	0	0	+	0	+	+	0	+	0	0	+	+	0	+	+	0	+	0	+	0	0	2
7	0	0	+	0	+	+	+	+	+	+	0	+	0	+	+	+	+	0	+	0	0	1
8	0	0	+	0	+	+	0	+	0	0	+	+	0	+	+	+	+	0	+	0	0	2
9	0	0	+	0	+	+	0	+	+	0	0	+	0	+	+	0	+	0	+	0	0	1
10	0	+	0	0	+	0	0	+	0	+	+	0	+	0	0	+	0	+	+	0	0	2
11	+	+	+	0	+	+	+	+	+	+	0	+	0	0	+	+	+	+	0	0	0	2
AC	+	0	+	+	0		+	+	+	+	0	+						+	+	0	0	0

Next steps...

- Mom is positive for most common antigens, so that helps!
 - Should not be able to make alloantibodies to c, E, K, Fy^a, Fy^b, Jk^b, S, or s.
 - Wow!! That narrows it down!
- Let's run some selected cells...
- What alloantibodies do you think she has now?

Selected Cells - Mom

Vial	RhHr						Kell		Duffy		Kidd		Lewis		P	MNSs				37	LISS-IgG	Ficin
	D	C	c	E	e	f	K	k	Fy _a	Fy _b	Jk _a	Jk _b	Le _a	Le _b	P ₁	M	N	S	s			
1	+	0	+	+	0	0	0	+	+	0	+	0	+	0	+	0	+	0	+	0	1	2
2	+	+	0	+	0	0	0	+	+	0	0	+	0	+	+	+	0	0	+	0	0	0
3	+	0	+	+	0	0	0	+	+	+	0	+	0	+	+	0	+	+	0	0	0	0
4	+	0	+	+	0	0	0	+	0	0	+	0	+	0	+	+	0	0	+	0	1	2
5	+	+	+	+	0	0	+	0	0	+	0	+	0	+	+	+	0	+	+	0	0	0
6	+	+	+	+	0	0	0	+	+	+	0	+	+	0	+	+	0	0	+	0	0	0
7	+	0	+	+	0	0	+	+	0	+	0	+	+	0	0	0	+	+	0	0	0	0
8	+	+	+	0	+	+	0	+	+	+	0	+	0	+	+	+	+	+	0	0	1	2

Now let's look at the baby...

- What testing should we do?
 - Eluate
- Since we already have a good idea about what the mom has, we have a good starting point with the baby.

Eluate Results - Baby

Cell	RhHr						Kell		Duffy		Kidd		Lewis		P	MNSs				IgG
	D	C	c	E	e	f	K	k	Fy a	Fy b	Jk a	Jk b	Le a	Le b	P 1	M	N	S	s	
1	+	0	+	+	0	0	+	+	0	+	0	+	0	+	+	+	+	0	+	0
2	+	w	+	+	0	0	0	+	+	0	+	+	0	+	+	+	0	+	+	1
3	0	+	+	0	+	+	0	+	+	0	0	+	+	0	+	+	0	0	+	1
4	+	0	+	+	0	0	0	+	+	0	0	+	0	+	0	0	+	0	+	0
5	+	+	0	+	0	0	0	+	+	0	0	+	0	+	+	+	0	0	+	0
6	+	+	+	+	0	0	0	+	0	+	0	+	0	+	+	0	+	0	0	0
7	+	+	+	+	0	0	0	+	+	+	0	+	+	0	+	+	+	0	+	0

What are our conclusions?

- Mom
 - anti-e + Jk^a in serum
- Infant
 - anti-e + Jk^a coating cells
- If either needs transfusion, will require e negative, Jk^a negative red cells
- But all is well after a time under the bili lights.
- Mom and baby go home...until...

Another Admission...

- Sample received 02/2007
- Currently pregnant
 - 7th pregnancy (she's been busy!!)
- Since it is known that she has alloantibodies, a titer requested for both anti-e and anti-Jk^a
- But first, we must reconfirm the antibodies...

Selected Cell Panel

	RhHr						Kell		Duffy		Kidd		Lewi s		P	MNSs					
Vial	D	C	c	E	e	f	K	k	F y a	F y b	Jk a	J k b	L e a	L e b	P 1	M	N	S	s	LISS-	PEG
1	0	0	+	0	+	+	0	+	+	+	0	+	0	+	0	0	+	+	0	0	1
2	+	+	0	0	+	0	0	+	+	+	0	+	+	0	+	+	+	0	+	0	0
3	+	0	+	+	0	0	0	+	+	+	+	0	0	+	+	+	0	+	+	1	2
4	+	w	+	+	0	0	0	+	+	0	+	0	0	+	+	+	+	+	+	1	2
5	+	+	+	+	0	0	0	+	+	+	0	+	+	0	0	0	+	0	+	0	0
6	0	0	+	+	0	0	0	+	+	0	0	+	0	+	+	+	0	0	+	0	0

- Since we now know the history, we can start with selected cells...
- Do you see something unusual??

What happened to the anti-e?

- One of our e+ selected cells is non-reactive.
- The R2R2 cells is negative.
- The rr cell is positive.
- Let's add a couple more e+ cells to see how they react...

Selected Cell Panel

	RhHr						Kell		Duffy		Kidd		Lewis		P	MNSs					
Vial	D	C	c	E	e	f	K	k	Fy _a	Fy _b	Jk _a	Jk _b	Le _a	Le _b	P1	M	N	S	s	LISS- I ₀ G	PEG
1	0	0	+	0	+	+	0	+	+	+	0	+	0	+	0	0	+	+	0	0	1
2	+	+	0	0	+	0	0	+	+	+	0	+	+	0	+	+	+	0	+	0	0
3	+	0	+	+	0	0	0	+	+	+	+	0	0	+	+	+	0	+	+	1	2
4	+	w	+	+	0	0	0	+	+	0	+	0	0	+	+	+	+	+	+	1	2
5	+	+	+	+	0	0	0	+	+	+	0	+	+	0	0	0	+	0	+	0	0
6	0	0	+	+	0	0	0	+	+	0	0	+	0	+	+	+	0	0	+	0	0
7	+	0	+	+	+	+	+	+	+	+	0	+	+	0	+	+	+	+	+	0	1
8	+	+	0	0	+	0	0	+	0	+	0	+	0	+	+	0	+	+	0	0	0

More interesting results!

- **What are your suspicions now?**
 - The two reactive cells are not only e+, but also f+!
- **So now what??**
 - Let's review panels from 06/2003
 - Conclusions
 - All e-, Jk(a-) cells also f-
 - All f+ cells also e+
- **Most likely anti-f + Jk^a in previous sample**
 - Anti-f reactive only in PEG at this time
 - Previous testing was done in LISS
 - Antibody appears to be slightly weaker this time

What is anti-f?

- The antibody recognizes a compound antigen made up of **c** and **e** in the cis position
 - present on the same chromosome
- Reacts with all **r (ce)** positive cells
 - If **c** and **e** are both present, but on opposite chromosomes (trans position), anti-f will not react (R1R2 or DCe/DcE)
- All **e+** cells will not be **f+** (R1R1, R2R2, R1R2)
- All **f+** cells will be **e+**

Conclusions

- Should we titer??
 - Possibility of HDN is present
 - Same as with previous pregnancy
 - Monitor for increases in titer
 - HDN due to either anti-f or anti-Jk^a usually mild
- Was there a problem with the previous transfusion recommendations?
 - Not really
 - any e negative unit (R2R2) is f negative

Recommendations

- If transfusion is necessary now...
 - Give Jk(a-), f- donor units
 - Includes R1R1, R2R2, R1R2
 - Also R^ZR1, R^ZR2 (but of course, these are very rare units!!)

**Thanks for your
participation!**

