

HDFN ABID CASE # 5

History: A 31 year old, G3P2002 woman was referred to a maternal fetal medicine specialist at 11 6/7 weeks gestation when she was found to have a positive blood group antibody screen due to anti-D plus anti-C (identified at another laboratory) on her first prenatal visit. Her first infant was born at 42 weeks gestation and was found to be severely anemic. The Kleihauer Betke test done at the time demonstrated an estimated fetal maternal hemorrhage of 1000cc fetal whole blood for which she is reported to have received 600 µg of intravenous Rh immune globulin every 8 hours for a total dose of 9000 µg.

ABO and Rh Typing

<A	<B	A1 cells	B cells	6% alb	<D	<D/AHG	CCC	Interp
4+	0	0	4+		0	0	2+	A neg

Antibody Screen

	Gel
OI	NT
OII	NT

Direct Antiglobulin Test

	Poly	IgG	<C3
AHG	0		
CCC	2+		

Intial Panel

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

HDFN ABID CASE # 5, pg 2

Additional cells

		Rh system						Kell						Duffy		Kidd		Xg	Lewis		MNSs				P	Lutheran		Other			
Cell	Rh	D	C	E	c	e	V	K	k	Kp ^a	Kp ^b	Js ^a	Js ^b	Fy ^a	Fy ^b	JK ^a	JK ^b	Xg ^a	Le ^a	Le ^b	S	s	M	N	P1	Lu ^a	Lu ^b	Typings	Gel		
5207	r'r	0	+	0	+	+	0	0	+	0	+	0	+	+	0	+	0	+	0	+	+	+	0	+	+	0	+			3+	
8387	r'r	0	+	0	+	+	0	0	+	0	+	0	+	0	0	+	0	+	0	+	0	+	+	+	+	0	+			3+	

Titration

ANTIBODY: Anti- C+D				EDC: 8/28/'08				Tech:				Date tested: 13 2/7 weeks			
Sample dilution, Reaction strength at AHG phase:															
	1	2	4	8	16	32	64	128	256	512	1024	2048	4096	8192	Titer
R1r	1+	vw+	0	0	0	0	0	0	0	0					1
Ror	0	0	0	0	0	0	0	0	0	0					<1
r'r	w+	0	0	0	0	0	0	0	0	0					1
Cell type: (see above)			Manufacturer:					Lot number:				Comment:			

QUESTION

1. The outside laboratory identified anti-D + -C. Note that the anti-C titer is greater than the anti-D titer. Is there any other possibility other than anti-D plus anti-C? What testing would prove this?

HDFN ABID CASE # 5, pg 3

A new specimen was received 6 weeks later, at which time the following tests were performed:

Raw serum panel

Lot# VRA113		Rh system						Kell						Duffy		Kidd		Xg	Lewis		MNSs				P	Lutheran		Other		
Cell	Rh	D	C	E	c	e	V	K	k	Kp ^a	Kp ^b	Js ^a	Js ^b	Fy ^a	Fy ^b	Jk ^a	Jk ^b	Xg ^a	Le ^a	Le ^b	S	s	M	N	P1	Lu ^a	Lu ^b	Typings	Cell	Gel
1	R1wR1	+	+	0	0	+	0	0	+	0	+	0	+	+	+	0	+	+	+	0	+	+	+	0	0	0	+	C ^w	1	
2	R1R1	+	+	0	0	+	0	+	+	0	+	0	+	0	+	0	+	+	0	+	0	+	0	+	0	0	+		2	
3	R2R2	+	0	+	+	0	0	0	+	0	+	0	+	+	+	+	+	+	0	0	+	+	+	+	0	+	+		3	2+
4	Ror	+	0	0	+	+	+	0	+	0	+	0	+	+	0	+	0	+	0	+	0	+	+	+	+	0	+		4	
5	r'r	0	+	0	+	+	0	0	+	0	+	0	+	+	+	+	+	+	0	+	0	+	+	+	+	0	+		5	3+
6	r''r	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	+s	0	+		7	0
8	rr	0	0	0	+	+	0	0	+	0	+	0	+	0	+	+	+	0	0	+	+	0	+	0	0	0	+		8	
9	rr	0	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	+	0	+		10	
11	R1R1	+	+	0	0	+	0	0	+	+	+	0	+	0	+	+	+	+	0	0	0	+	+	0	+s	0	+		11	

Alloadsorbed serum panel; one aliquot adsorbed with Ror cells, one with r'r cells

Lot #05500		Rh system						Kell						Duffy		Kidd		Lewis		P	MNSs				Lutheran		Xg	Other Typings	Cell	Adsorbing cell phenotype	
Cell	Rh	D	C	c	E	e	V	K	k	Kp ^a	Kp ^b	Js ^a	Js ^b	Fy ^a	Fy ^b	Jk ^a	Jk ^b	Le ^a	Le ^b	P1	M	N	S	s	Lu ^a	Lu ^b	Xg ^a			Ror	r'r
1	R1R1	+	+	0	0	+	0	+	+	+	+	0	+	0	+	+	0	0	+	+	0	+	0	+	0	+	+		1	0	
2	R1wR1	+	+	0	0	+	0	0	+	0	+	0	+	0	+	+	0	0	0	+	+	0	+	0	0	+	+	C ^w	2	0	0
3	R2R2	+	0	+	+	0	0	0	+	0	+	0	+	0	+	+	+	0	+	+	+	0	+	+	+	+		3	0	0	
4	Ror	+	0	+	0	+	0	0	+	0	+	+	+	+	0	+	0	0	0	+	0	+	0	+	0	+	+		4	0	
5	r'wr	0	+	+	0	+	0	0	+	0	+	0	+	+	+	+	0	0	+	0	+	0	0	+	0	+	+		5	0	0
6	r''r	0	0	+	+	+	0	0	+	0	+	0	+	+	+	+	0	0	+	+	+	+	+	+	0	+	+	Co(b+)	6		
7	rr	0	0	+	0	+	0	+	+	0	+	0	+	0	+	+	+	+	0	0	0	+	0	+	0	+	+		7		
8	rr	0	0	+	0	+	0	0	+	+	+	0	+	+	0	0	+	0	+	+	+	0	+	+	+	+	+		8		
9	rr	0	0	+	0	+	0	0	+	0	+	0	+	0	0	+	+	+	0	+	0	+	0	0	0	+	+		9		
10	R1R1	+	+	0	0	+	0	+	+	+	+	0	+	+	0	+	0	0	+	+	+	+	0	+	0	+	+		10		
11	r''r	0	0	+	+	+	0	0	+	0	+	0	+	+	+	0	+	0	+	+	0	+	0	+	0	+	0	Co ^b +, I-	11		

HDFN ABID CASE # 5, pg 4

HDFN ABID CASE # 5, pg 5

Serial titration yielded the following results:

Titration using the same R1r cell target in each case

Sample day by gestation	Sample dilution; Reaction strength at AHG phase:												
	1	2	4	8	16	32	64	128	256	512	1024	2048	Titer
13w2d	1+	vw+	0	0	0	0	0	0	0	0			1
19w4d	w+	vw+	0	0	0	0	0	0	0	0			1
24w	vw+	0	0	0	0	0	0	0	0	0			<1
27w6d	w+	w+	0	0	0	0	0	0	0	0			2
29w6d	3+	2+	w+	0	0	0	0	0	0	0			4
31w6d	4+	4+	3+	2+	1+	w+	0	0	0	0			32
33w2d	4+	4+	4+	4+	3+	2+	1+	w+	vw+	0			128

Alladsorbed serum panel, specimen from 29 weeks & 6 days, r'r adsorbing cell

Lot #		Rh system						Kell						Duffy		Kidd		Lewis		P	MNSs					Lutheran		Xg	LISS, AHG	
Cell	Rh	D	C	c	E	e	V	K	k	Kp ^a	Kp ^b	Js ^a	Js ^b	Fy ^a	Fy ^b	Jk ^a	Jk ^b	Le ^a	Le ^b	P1	M	N	S	s	Lu ^a	Lu ^b	Xg ^a	Cell	Raw plasma	Adsorbed plasma
3	R2R2	+	0	+	+	0	0	0	+	0	+	0	+	+	0	+	0	0	+	+	+	0	0	+	0	+	+	3	3+	3+
4	Ror	+	0	+	0	+	+	0	+	0	+	0	+	+	0	+	+	0	+	+	+	+	0	0	0	+	0	4	3+	3+
5	r'r	0	+	+	0	+	0	0	+	0	+	0	+	+	+	0	+	+	0	0	+	+	+	+	0	+	+	5	2+	0
11	r'r	0	+	+	0	+	0	0	+	0	+	0	+	+	+	+	0	0	+	+	+	+	0	+	0	+	+	11	1+	0

HDFN ABID CASE # 5, pg 6

QUESTION:

6. What antibody specificity(ies) is(are) demonstrated now?

7. What would you advise the patient's physician?

CASE FOLLOWUP:

Middle cerebral artery velocity was determined by doppler sonography at 32w3d, 33w2d, and 34w4d. It was normal on the first two occasions but was elevated on the third exam (PSV=0.82 m/s, ULN = 0.731 m/s). Amniocentesis at 34w4d demonstrated a slightly elevated $\Delta OD_{450} = 0.5$ (ULN 0.4) and fetal lung maturity, so the patient was referred for delivery at her local hospital the next day. The newborn infant did well with one exchange transfusion.