

## Case 1

What went wrong?!

# Scenario

- ④ You have just taken over on a shift in the blood transfusion laboratory and are called for advice regarding a patient with SCD (Mrs X), currently receiving a unit of blood issued earlier in the day. The patient is anxious, has pyrexia, tachycardia and an urticarial rash. Antihistamines have been given with no improvement.
- ④ You contact the duty Haematology consultant (who is unaware of the patient) and retrieve the pre-Tx results on Ms X. You find that that the request was received with no clinical details, however four units of group A D positive Jk(a-) blood were issued based on the following testing and interpretations:

# Questions

- ④ Immediate advice?
- ④ Anything wrong with the serology / interpretations?
- ④ Anything wrong with the protocol?
- ④ Further investigations?
- ④ What would you have done differently?

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# Immediate advice?

- ➡ Patient appears to be having a transfusion reaction, stop the transfusion immediately
- ➡ Recheck identity of pack and patient (INFORM LAB IF ERROR), and return everything.
- ➡ Establish which unit(s) have been given / not given - do not use any other units
- ➡ Get patient's clinician to discuss with Consultant Haematologist URGENTLY.
- ➡ Request samples for FBC, U+E, urine and repeat group & antibody screen.

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# Initial Haematology Results

Hb	6.3 g/dl	(12.0 to 16.0)
WCC	$8.8 \times 10^9/l$	(4.0 to 11.0)
Plt	$282 \times 10^9/l$	(135 to 420)
RCC	$1.92 \times 10^{12}/l$	(3.8 to 5.2)
PCV	0.17 l/l	(0.37 to 0.47)
MCV	87.9 fl	(76.0 to 96.0)
MCH	32.5 pg	(27.0 to 32.0)
MCHC	37.0 g/dl	(31.5 to 35.5)

Sickle cell test	Positive
HPLC	Bands in positions of Hb S and Hb F
Hb F	20.8 %
Hb S level	65.1 %

# Group and Screen

	Anti-A	Anti-B	Anti-D	Anti-D	Control	A cells	B cells
<b>Ms X</b>	<b>4</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>
A <sub>1</sub> rr	4	0	0	0			
B rr	0	4	0	0			
0 R <sub>1</sub> r	0	0	4	4			

Cell	Rh	C <sup>w</sup>	C	c	D	E	e	M	N	S	s	P1	Lu <sup>a</sup>	K	k	Kb <sup>a</sup>	Le <sup>a</sup>	Le <sup>b</sup>	Fv <sup>a</sup>	Fv <sup>b</sup>	Jk <sup>a</sup>	Jk <sup>b</sup>	IAT Results	
																							Ms X	Wk. anti-D
<b>1</b>	<b>R<sub>1</sub><sup>w</sup>R<sub>1</sub></b>	<b>+</b>	<b>+</b>	<b>-</b>	<b>+</b>	<b>-</b>	<b>+</b>	<b>+</b>	<b>-</b>	<b>+</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>+</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>+</b>	<b>-</b>	<b>-</b>	<b>+</b>	<b>2+</b>	<b>2+</b>
<b>2</b>	<b>R<sub>2</sub>R<sub>2</sub></b>	<b>-</b>	<b>-</b>	<b>+</b>	<b>+</b>	<b>+</b>	<b>-</b>	<b>+</b>	<b>-</b>	<b>+</b>	<b>-</b>	<b>+</b>	<b>-</b>	<b>+</b>	<b>+</b>	<b>-</b>	<b>+</b>	<b>-</b>	<b>+</b>	<b>-</b>	<b>+</b>	<b>-</b>	<b>3+</b>	<b>2+</b>
<b>3</b>	<b>rr</b>	<b>-</b>	<b>-</b>	<b>+</b>	<b>-</b>	<b>+</b>	<b>+</b>	<b>+</b>	<b>+</b>	<b>-</b>	<b>+</b>	<b>+</b>	<b>-</b>	<b>-</b>	<b>+</b>	<b>-</b>	<b>-</b>	<b>+</b>	<b>-</b>	<b>+</b>	<b>+</b>	<b>+</b>	<b>2+</b>	<b>0</b>

# Antibody ID

Cell	Rh	C <sup>w</sup>	C	c	D	E	e	M	N	S	s	PI	Lu <sup>a</sup>	K	k	Kp <sup>a</sup>	Le <sup>a</sup>	Le <sup>b</sup>	Fy <sup>a</sup>	Fy <sup>b</sup>	JK <sup>a</sup>	JK <sup>b</sup>	Mrs X IAT Results	Mrs X Enzyme Results	
1	R <sub>1</sub> <sup>w</sup> R <sub>1</sub>	+	+	-	+	-	+	+	-	+	-	-	-	-	+	-	-	-	+	-	+	-	4+	4+	
2	R <sub>1</sub> R <sub>1</sub>	-	+	-	+	-	+	+	-	+	-	+	-	-	+	-	+	-	+	-	+	+	4+	4+	
3	R <sub>2</sub> R <sub>2</sub>	-	-	+	+	+	-	+	+	-	+	+	-	+	+	-	-	+	-	+	-	+	-	-	-
4	r'r	-	+	+	-	-	+	-	+	-	+	+	-	+	+	+	-	+	+	-	+	+	4+	4+	
5	r''r	-	-	+	-	+	+	-	+	+	-	-	-	-	+	-	+	-	+	+	+	+	2+	4+	
6	rr	-	-	+	-	-	+	+	+	+	+	+	-	+	-	-	-	-	-	+	+	-	4+	4+	
7	rr	-	-	+	-	-	+	-	+	-	+	-	-	-	+	-	+	-	+	+	+	+	2+	4+	
8	rr	-	-	+	-	-	+	-	+	+	+	+	-	-	+	-	+	+	+	+	+	+	2+	4+	
9	rr	-	-	+	-	-	+	-	+	+	+	+	+	-	+	-	-	+	+	-	-	+	-	-	-
10	rr	-	-	+	-	-	+	+	+	-	+	+	-	+	+	-	+	-	-	+	+	-	4+	4+	

# Crossmatch / donor phenotyping

<b>Unit</b>	<b>Anti-Jk<sup>a</sup></b>	<b>IAT XM</b>	<b>Interpretation</b>
1 A pos	0	0	Compatible
2 A pos	0	0	Compatible
3 A pos	0	0	Compatible
4 A pos	0	0	Compatible

# Incorrect serology / interpretation

- ✘ Unexplained reaction by IAT in screen disregarded
- ✘ Antibody ID is incomplete, anti-C and anti-S not excluded in panel
  - ? **Haemolysis due to anti-C or anti-S**
- ✘ No controls with IATXM or Jka screening of units
  - ? **False negative results - haemolysis due to anti-Jk<sup>a</sup>**
- ✘ Phenotyping not obtained (test phenotype if not already known and patient not transfused within last 3 months)

# Questions

- ④ Immediate advice?
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# What was wrong with protocol?

- ✘ Transfusion request accepted without clinical details
- ✘ No review of Haematology results, suggesting SCD in which case transfusion may not be appropriate
  - *Care must be taken not to raise Hb too much - increase viscosity - increase risk of sickling and stroke*
  - *Need to select Rh and K matched, Hb S negative units*
- ✘ No attempt to access records from St Elsewhere
- ✘ Haematologist not called

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# Further investigations (1)

- ➡ Check correct identification of patient, blood unit and laboratory samples.
- ➡ Repeat blood group, antibody ID, DAT, cross-match using pre-and post transfusion samples
- ➡ Exclude clinically significant antibodies, or identify any additional antibody specificities and phenotype units for corresponding antigens
- ➡ Perform (or refer for) eluate if DAT positive
- ➡ ? sickle auto lysis

# Further investigations (2)

- ➔ Look for evidence of increased red cell destruction; fall in Hb, rise in LDH, bilirubin (LFTs) and haemoglobinuria
- ➔ Raised retics?, monitor HbS / HbA levels (HbS test units)
- ➔ Look for evidence of disseminated intravascular coagulation; coagulation screen including PT, APTT, fibrinogen level, thrombin time and FDPs or equivalent.
- ➔ Assess renal function; U&E, creatinine
- ➔ Request blood cultures to exclude bacterial contamination

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# What would you have done differently?

- ➡ Obtain clinical details and transfusion history (? from another treatment centre) before transfusion if possible
- ➡ Involve Consultant Haematologist and try to delay transfusion, until it is established that it is essential / appropriate to transfuse, and until testing is complete.
- ➡ If have to issue blood prior to full testing – eg patient has chest crisis, at least warn clinicians of risks
- ➡ Complete antibody ID excluding all potentially clinically significant specificities
- ➡ Obtain patient phenotype, and provide HbS negative, Jk<sup>a</sup> neg, Rh matched, K- blood
- ➡ Use appropriate controls with all tests