

Use of Incompatible Blood in a Life Threatening Obstetric Haemorrhage (?)

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Use of Incompatible Blood in a Life Threatening Obstetric Haemorrhage (?)

- C&W Hospital runs a high risk maternity unit
- This case:
 - 40 year old woman, term pregnancy
 - Scheduled to undergo elective LSCS
 - One previous pregnancy in 2009
 - No atypical antibodies detected then
 - No previous blood transfusions

- 10/2/12 - positive antibody screen
 - » Further sample requested
 - » Please do not order blood at short notice

Patient file: ANTONIA LOIZIDES

File Display Help

General Address

Pat. number: 01981368
 Alternate patient
 Hos. number: ...
 Admission date:
 Discharge date:
 Name:
 First name:
 Maiden name:
 Birthdate: 15/03/1971
 Sex: Female

Request #	Collection date	Doctor	Loc.
2023177391	17/02/2012 23:01	DUNK	MAPP
2023174866	17/02/2012 18:34	DUNK	MAPP
2023174824	17/02/2012 11:19	DUNK	MAPP
2023174218	10/02/2012 15:16	DUNK	MAPP
1113167875	25/11/2011 15:58	DUNK	MAPP
9103083476	06/10/2009 14:24	DUNK	MAPP
9073074249	14/07/2009 17:26	DUNK	CW

Details Samples Results

BloodBank

Patient Gp & Screen

Blood group: Group B
 Rhesus: Rh Positiv
 Antibody Screen: Irregular Antibodies Detected
 Additional Comments: Patient's serum contains antibodies,however, investigation of positive antibody screen was inco...

Diamed

Diamed Request CX/CW

Anti A: -
 Anti B: 4+
 Anti D1: 4+
 Anti D2: 4+
 A1 cells: 4+
 B cells: -
 Screening Cells 1: -
 Screening Cells 2: 1+ ← 'c' positive
 Screening Cells 3: -

Auto PAP Camb Cells

Cam Pap Cells 1: -
 Cam Pap Cells 2: -
 Cam Pap Cells 3: -
 Cam Pap Cells 4: -
 Cam Pap Cells 5: -
 Cam Pap Cells 6: -
 Cam Pap Cells 7: -
 Cam Pap Cells 8: -
 Cam Pap Cells 9: -
 Cam Pap Cells 10: -
 Cam Pap Auto: -
 Internal Notes: Papain panel 45171.67.x exp 27.02.12

Auto IAT Diam cells

Diamed Cells 1: -
 Diamed Cells 2: -
 Diamed Cells 3: -
 Diamed Cells 4: -
 Diamed Cells 5: -
 Diamed Cells 6: -
 Diamed Cells 7: -

or Help, press F1

7

- One week later on 17/2/12:
- G&S sample received
 - But this time the antibody screen was negative.
- ? So....
 - Was the previous positive antibody screen performed one week beforehand clinically significant ?

Events on 17/2/12

17/2/12 - 1155 hrs	G&S sample received Antibody screen negative No request for a XM made at the time
17/2/12 - 1320 hrs	Elective LCS
17/2/55 - 1720 hrs	MOH - urgent request for 4 units of red cells Full IAT XM required as historical antibodies (one week previously) Patient returned to theatre – hypotensive. 2 litres of blood in abdomen/ large haematoma. Bleeding points identified and sutured. Patient sent to HDU Post op Hb 6.6 g /dl

Blood Bank Response in MOH

	OPTIONS	Time for blood to be available
<i>Samples that satisfy criteria for electronic issue i.e. historical and current sample</i>	EI	5 minutes
<i>Tested sample in lab:- NO ANTIBODIES</i>	ISX	10 minutes
<i>Tested sample in lab:- ANTIBODIES</i>	IAT crossmatch	Dependant on specificity and antigen negative blood availability See 8.2 *Anti-c or anti-e, remind the team that the Emergency O negative blood is unsuitable for that woman unless its use is considered literally lifesaving.
<i>NO tested sample in lab:- NO HISTORY of ANTIBODIES</i>	EI/ISX	45minutes from the time the sample is received in Blood Transfusion Laboratory (ASSUMING NO ANTIBODIES DETECTED)
	Uncrossmatched group specific blood	Available in 10 minutes on receipt of sample in BT Laboratory (we must have a sample prior to issue of blood even if group is known)
	Emergency O negative blood	2 units available immediately in Labour Ward fridge and a further 2 units in Blood Issue fridge
<i>NO tested sample in lab:- HISTORY of ANTIBODIES</i>	<p>If the patient is known to have atypical antibodies make this clear at the outset. If the patient is known to have anti-c or anti-e antibodies inform the team that the Emergency O negative blood is incompatible and thus unsuitable for that woman unless its use is considered literally lifesaving.</p> <ul style="list-style-type: none"> ◆ Inform the Haematology Clinician of this situation as soon as possible ◆ Search the stock for suitable units, if necessary order units blue light from NBS 	

Some issues

- Patient's phenotype: Group B, R_1R_1 K- (i.e. CDe/CDe, K-)
- Obstetricians called for Flying Squad Blood
- O Negative (rr) blood may not be compatible ('c'+)
- Only 5 units of R_1R_1 K- units in C&W Bank
- 6 more units ordered from NHSBT - may take 2-3 hours to arrive

<p>Serological reactions on 17/02/12</p>	<p>This antibody screen negative, but positive one week previously.</p> <p>IAT XM set up against:</p> <p>2 units of Group B, R₁R₁ Kell neg</p> <p>3 units of Group O R₁R₁ Kell neg</p> <p>This XM would take c. 45 minutes</p> <p>4 units issued (1 unit incompatible)</p>
<p>Remaining blood available in C&W Blood Bank on 17/02/12 after initial 4 units issued</p>	<p>2 units Group O, R₁R₁ Kell <u>positive</u></p> <p>1 unit Group B, R₁r Kell neg</p> <p>3 units Group O, R₁r Kell neg</p> <p>12 units Group O, rr Kell neg</p> <p>Group O neg (rr), Kell neg blood available (but 'c' positive)</p>

Dilemma

- Blood required immediately - no time for workup.
- Antibody screen positive one week ago.
- Antibody screen negative now.
- Patient's Group: B, R₁R₁, Kell neg
 - (Possible Ab: anti-c, or an anti-K, or something else)
- 4 units R₁R₁ K- blood issued - THEN WHAT?
- BEWARE Rh neg blood ('c' pos) or Kell pos blood:
 - Both could cause HDN in any future pregnancy
 - Anti-c might result in haemolysis
- Immediately available blood after first 4 units is either Kell positive or 'c' positive.

Dilemma

- Immediately available blood after the first 4 units have been issued is either Kell positive or 'c' positive.
- Just to make it more interesting:
 - 1 of the 5 units of $R_1R_1K^-$ units was incompatible by IAT XM.

Notes

Rh negative blood rr (cde/cde) = 90% of all D negative blood
99.9% of D negative blood is c positive (either cc or Cc) in UK Caucasians
~ 77% of D positive blood is c positive (either cc or Cc) in UK Caucasians
~ 91% of donors are Kell antigen negative

What would you do?

- BMS informed Haem SpR that if more than 4 units required for this MOH then on-site red cells may be incompatible.
- Haem SpR contacted on-call NHSBT consultant - not the duty C&W haematology consultant (good call!)
- NHSBT consultant's choice - if any further blood is required after the first 4 units, then which one of the following options to choose?
 - Group O R_1R_1 K+ (2 units available)
 - Group O rr K- (12 units available)
 - Group O or B, R_1r K- (4 units available)

Thoughts

- Anti-c was unlikely
 - Only 1/3 screening cells was positive 1 week ago.
 - Only 1/5 units were incompatible on XM

NHSBT Consultant did not know Rh phenotype of these 5 units

- 99% of Rh- blood and 77% of Rh+ blood is 'c' antigen positive.
- Must avoid Kell pos blood (future risk of HDN)

IT'S ONLY A
GAMBLING PROBLEM
IF YOU'RE LOSING



Thoughts

- Therefore best choice is:
- O neg (rr) K- negative blood
 - Avoids Kell incompatibility
 - Avoids Rhesus incompatibility (anti-c very unlikely)
 - Deal with other incompatibility if needs be.
- What Obstetrician asked for in the first place!

Other measures

- Limited need for allogeneic blood
 - Correct coagulation defects
 - Check platelet count
 - Cell salvage
 - Avoid aspirin
 - Follow MOH protocol
- Avoid use of Kell positive blood unless dire need (avoid future HDN and possible haemolysis).
- Use available D pos or neg (but Kell neg) whilst waiting for additional:
- Group O or B, R_1R_1 Kell neg from Colindale

Aftermath

- 4 units of R₁R₁ K- blood issued immediately from C&W stock plus 4 units of FFP
- Samples sent to NHSBT for investigation.
 - No irregular antibodies detected
 - NHSBT issued an additional 4 units of Group O, R₁R₁ Kell neg
 - One of these 4 units was incompatible by IAT XM
 - Thus, in total 2 units of R₁R₁ Kell neg were incompatible (one from C&W stock, one from NHSBT stock)
 - This suggests a low titre, clinically insignificant antibody
- Patient recovered fully