Anti-Wr\textsuperscript{a} - A Case study

Joint meeting of UK NEQAS (BTLP) and BBTS Blood Bank Technology SIG 2019

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Past medical & transfusion History

* 44 year old female with alcohol related cirrhosis of the liver
* Menorrhagia
* Received multiple Electronically Issued red cell transfusions over the preceding 8 years
* Sept 2017 admitted – heavy PV bleeding
* 4 RBC units transfused uneventfully (Hb 64-95g/L)
* Further transfusion required 1 week later, Hb 76g/L ...
Patient symptoms

* Unit started at 07:00
* Approx 75mls transfused.

* Patient observations:
  * Slight temperature rise of 1.6 degrees,
  * Patient felt cold and shaky,
  * Raised pulse to 138bpm,
  * Slight drop in blood pressure to 105/60

* Patient treated with paracetamol and piriton
Laboratory results

* Pre transfusion
  * Hb 76 g/L.
  * LDH level 208 IU/L,
  * Total Bilirubin 19µmol/L.

* 2hrs Post transfusion
  * Hb 76 g/L
  * Blood film showed decreased platelets and polychromasia.
  * Reticulocyte 345 x 10⁹/L.
  * LDH level 288IU/L,
  * Total Bilirubin 56µmol/L.
Pre transfusion sample
- Antibody screen negative
- Mono DAT negative.

Post transfusion sample
- Antibody screen negative
- Mono DAT negative.

Pre transfusion and post transfusion samples crossmatched against the offending unit...
- **Both pre & post transfusion samples incompatible with the unit.**

Could the unit be DAT positive?
- A monospecific DAT on the unit...
- **Negative!**
Could the patient have an antibody to a low frequency antigen?

The patient was typed as negative for both Kp(a) and Lu(a)…….
  * But the unit was both KP(a) and Lu(a) negative

Four additional units were fully crossmatched for the patient— all were compatible.

The Pre and Post transfusion samples plus the unit’s pilot line were sent to NHSBT RCI for further investigation…
Anti-Wr(a) detected in patient plasma

Unit transfused was typed as Wr(a) positive

Unit transfused was incompatible by IAT crossmatch
What Blood Group System does Wr(a) belong to?

1. Duffy
2. ABO
3. Colton
4. Knops
5. Diego
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1. Duffy
2. ABO
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4. Knops
5. Diego

The Diego system consists of 21 antigens: two pairs of antithecal antigens, Di(a) and Di(b), Wr(a) and Wr(b), plus 17 antigens of very low frequency.
The occurrence of the Wr(a) antigen is less than 0.1% of the population.

* 1 in 1000 donated units of RBC’s will carry the Wr(a) antigen

Anti-Wr(a) is a relatively common naturally occurring antibody

Incidence increases dramatically in patients, post partum women people with other alloantibodies and those with AIHA
Anti-Wr(a) can cause:
- mild to severe/ immediate or delayed haemolytic transfusion reactions
- mild to severe haemolytic disease of the newborn.

- Labs don’t routinely screen for anti-Wr(a)
- Not on many antibody ID panels
- EI means no pre transfusion compatibility testing

- Education in hospitals about the management of transfusion reactions is important.
24 hours post reaction:
- Hb dropped to 69 g/L
- Blood film showed haemolytic features, polychromasia and occasional nucleated red blood cells.
- Haptoglobin = 0.10 g/L,
- LDH = 448 IU/L,
- Total Bilirubin = 33 µmol/L.

The patient was transfused further using serologically crossmatched red cells
- 48 hours post reaction Hb 86 g/L.
- One month post reaction all results were back in normal ranges.