A Case of Haemolytic Disease of the Newborn due to a Low Incidence Antigen

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Monash Medical Centre
Case Presentation Mrs SA

- 36 Year old female with DCDA twins
- Two previous live births (June 2003, June 2008)
- No previous surgery or blood transfusions
- Patient and partner from Egypt
- Gestation diabetes controlled by diet
- NVD of Twin Girls with breech delivery of Twin 2
- E. coli UTI with post partum pyelonephritis
Twins Clinical Course

- DCDA Twins
- 36.1 weeks gestation
- Neonatal hypoglycaemia
- Feeding problems, vomiting
- Noted to be jaundiced on Day 3
Testing on the Twins

- Bilirubin
- FBE
- Blood Group and DAT
Testing on the Twins

- Blood Groups on Twin 1 and Twins 2 were A Rh(D) Positive

- DAT Positive
  - Score 3 (0 - 4 grading system)

- Maternal Blood Group A Rh(D) Positive

- No antibodies detected by three cell screen
Further Testing on Maternal Sample

• 11 cell panel tested (CSL Panel B 0.8%)

• Selected cells from CSL Panel C tested
Phenocell C

All panel cells tested were Negative by IAT.
Further Testing

• Asked for a paternal sample
  • Many delays
  • Paediatric team happy to monitor the FBE and Bilirubin levels and treat empirically

• Miscommunication – incorrect Maternal results noted in the Medical Record of the twins
Results from Monash Health

- Maternal plasma reacts by IAT with Paternal red cells

- DiaCidel eluates from red cells of Twins 1 and 2 react with Paternal red cells

- Still don’t know what the antibody is
Treatment
Bilirubin Results

![Graph showing Bilirubin Level (μmol/L) over time for Twin 1 and Twin 2, with a peak around 13/03/2015 and a decrease after 14/03/2015. The graph indicates the effectiveness of phototherapy.]
Results from the Blood Service

• Maternal plasma contains anti-Wr\textsuperscript{a}
  • Anti-Wr\textsuperscript{a} strongly reactive by saline at 22\degree C and 37\degree C, low ionic IAT and papain

• A Rh(D) Positive

• DCcee, K-k+ Kp(a-), Fy(a+b-), Jk(a-b+), M+N+S-s+, Lu(a-), Co(b-), Wr(a-)

• Titre of the anti-Wr\textsuperscript{a}
  • 37\degree C Saline : Titre 4
  • Saline-IAT : Titre 16
Results from the Blood Service

• Paternal Sample

• A Rh(D) Positive

• DCcee, K-k+, Kp(a-), Fy(a-b+), Jk(a+b+), M+N+S-s+, Lu(a-), Co(b-), Wr(a+)
Results from the Blood Service

• Twin 1 A Rh(D) Positive Wr(a+)
  • DAT Positive Score 8 (0 - 12)
  • An acid glycine elution contained anti-Wr

• Twin 2 A Rh(D) Positive Dcee, K-, Wr(a+)
  • DAT Positive Score 8 (0 - 12)
  • Insufficient cells for an acid glycine elution
Outcome

- Twins discharged on Day 7
  - Bilirubin levels dropping
  - Discharged against medical advice

- Monitored by Hospital in the Home
  - Consent for Bilirubin testing refused on Day 8
  - Consent for Bilirubin testing refused on Day 10
Diego Blood Group System

- ISBT Blood Group System 10, 22 antigens
- Wr(a+b-) 1972G>A Glu 658 Lys

## Frequency of anti-Wra

<table>
<thead>
<tr>
<th>Population</th>
<th>Country</th>
<th>Frequency (%)</th>
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<tbody>
<tr>
<td>Blood Donors</td>
<td>England</td>
<td>1.25, 1.06</td>
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<td>Hospital Patients</td>
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<td>Hospital Patients</td>
<td>Italy</td>
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</table>
Frequency of anti-Wra

Issues for Future Pregnancies

• Negative antibody screening test will provide false reassurance
  • Educate the patient
• Problem in monitoring titres
  • Wr(a+) cells not routinely available
• Limited literature about likely clinical outcome
  • HDFN ranges from mild to severe
• Risk of HTRs with future transfusions
## Frequency of Wr\(\text{a}\) Antigen

<table>
<thead>
<tr>
<th>Population</th>
<th>Number Tested</th>
<th>Number Wr(\text{a}+)</th>
<th>Wr(\text{a}) Frequency</th>
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<tbody>
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<td>English</td>
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<tr>
<td>Americans (New York)</td>
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