Severe Haemolytic Disease of the Newborn due to anti-Kpα

Dot Stern, Blood Bank, POW Hospital, Randwick NSW.
Debbie Mills-Wallbridge, OCD, North Ryde
Case History (1)

AS, 31yo G1P4, group A. No antibodies detected on routine screen.

Past history of anti-Kp\textsuperscript{a} detected at RPA.

Anti-Kp\textsuperscript{a} detected on extended testing.
Case History (2)

May 2011 titre 64. Ultrasound showed an affected foetus. An IUT was arranged.

Foetal Hb 29 g/L.

Blood film showed evidence of bone marrow suppression.
Case History (3)

There were 2 subsequent IUTs and the baby was delivered at 34 weeks.

Cord blood Hb 159 g/L.
Bili peaked at day 2 175µmol/L.

Transfusions were required at 7 weeks (Hb 68g/L) and 12 weeks (Hb 78 g/L)
Antibodies to LFAs and HDN

Many LFAs have caused HDNB. These include:
RH: Go<sup>a</sup>, E<sup>W</sup>, Be<sup>a</sup>, Evans, Riv,
KELL: Kp<sup>a</sup>, Js<sup>a</sup>,
MNS: V<sup>W</sup>, Mit, Mur, Hil, Hut,
DIEGO: Wr<sup>a</sup>, ELO, Di<sup>a</sup>,
LFAs: HJK, Kg, REIT, JFV, JONES, Bi.

Some of these antigens have been found as a result of HDNB
Antibody Screens

ANZSBT guidelines mandate the use of at least 2 screening cells. One should be $R_1R_1$, the other $R_2R_2$. The cells must also be: $Jk(a-b^+)$, $Jk(a+b^-)$, $Fy(a-b^+)$ and $Fy(a+b^-)$. SS and ss cells are desirable.

“Anti-$Kp^a$ and anti-$C^w$ are rarely of clinical significance, consequently $Kp(a^+)$ and $C^w+$ cells are not essential.”
Overseas requirements

FDA mandates the following antigens are represented: C, D, E, c, e, M, N, S, s, P1, Le\textsuperscript{a}, Le\textsuperscript{b}, K, k, Fy\textsuperscript{a}, Fy\textsuperscript{b}, Jk\textsuperscript{a} and Jk\textsuperscript{b}.

There is no requirement for homozygosity.

BCSH minimum requirements are C, c, D, E, e, K, k, Fy\textsuperscript{a}, Fy\textsuperscript{b}, Jk\textsuperscript{a}, Jk\textsuperscript{b}, S, s, M, N and Le\textsuperscript{a}.

Additional recommendations are R\textsubscript{1} R\textsubscript{1} or R\textsubscript{1w} R\textsubscript{1} and R\textsubscript{2} R\textsubscript{2}.

Homozygosity for Kidd, Duffy & S/s recommended
What are the odds?

Group O R₁R₁, Fy(a-b+), Jk(a+b-), Ms 0.06%

Group O R₂R₂, Fy(a-b+), Jk(a-b+), Ns 0.001%

Group O rr, Fy(a+b-), Jk(a+b-), MS 0.02%

But: Kp(a+) = 2.3%, C⁺⁺⁺⁺ = 2.5%

R₁R₁⁺⁺⁺⁺ = 0.0014% (1.4/100,000)

rr, Kp(a+) = 0.0005% (5/1,000,000)
Screening Cells in Australia

Company A promises $C^w+$ and $Kp(a+)$ cells on all batches.
Company B has $C^w+$ on most batches
Company C promises neither.
Company D has $Kp(a+)$ on most batches
Company E has $C^w+$ and $Kp(a+)$ if possible
What do we need?

Given the changing nature of the Australian population should we change our requirements?

What antigens should be on the cells?

What should we drop?

Should there be different panels for different situations e.g. pregnancy vs pre-op screen?
Choosing screening cells:

At least two companies have a variety of screening cells on the market expressing other low incidence antigens although they are not available in Australia.

e.g. GP.Mur (Milll) for SE Asia

Di(a+) for Korea, Japan and Latin America
What about Ethnicity?

What is the ethnic origin of the donor population?

Is it the same as that of the population being transfused?

Is it possible to detect all clinically significant antibodies without a full crossmatch?
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Aboriginal</td>
<td>100.0%</td>
<td>0.8%</td>
<td>1.0%</td>
<td>1.0%</td>
<td>1.5%</td>
<td>1.6%</td>
</tr>
<tr>
<td>Anglo-Celt</td>
<td>0.0%</td>
<td>89.8%</td>
<td>76.6%</td>
<td>74.5%</td>
<td>69.9%</td>
<td>62.2%</td>
</tr>
<tr>
<td>Other European</td>
<td>0.0%</td>
<td>8.8%</td>
<td>20.1%</td>
<td>19.4%</td>
<td>18.9%</td>
<td>16.1%</td>
</tr>
<tr>
<td>West Asian*</td>
<td>0.0%</td>
<td>0.2%</td>
<td>1.1%</td>
<td>2.5%</td>
<td>2.5%</td>
<td>4.9%</td>
</tr>
<tr>
<td>N, S and SE Asian</td>
<td>0.0%</td>
<td>0.4%</td>
<td>0.9%</td>
<td>2.2%</td>
<td>6.6%</td>
<td>14.2%</td>
</tr>
<tr>
<td>Other**</td>
<td>0.0%</td>
<td>0.1%</td>
<td>0.3%</td>
<td>0.5%</td>
<td>0.7%</td>
<td>1.1%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Nos (000's)</td>
<td>500</td>
<td>3,275</td>
<td>7,640</td>
<td>16,300</td>
<td>20,848</td>
<td>22,523</td>
</tr>
</tbody>
</table>