Rh concomitant antibody pair: anti-E and anti-c in R1R1 individuals. How different are our laboratory protocols?

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Current ANZSBT guidelines states:

2.2.1.1 There must be clearly written policies on selection of red cells for both routine and exceptional transfusion situations.
AIM

- Present our protocol on selection of red cells for transfusion and application in R1R1 patients with anti-E

- Discuss and learn from peers their respective protocols, if any different from ours. Also discuss challenges / issues with proficiency testing as current guidelines and standards do not directly address Rh concomitant antibodies
Rh concomitant antibodies

- Some Rh antibodies often occur together/in concert
- Anti-E and anti-c most common in R1R1
- Individual with anti-E, mostly likely exposed to c as well
- When anti-E is detected, anti-c may be present although undetected (weaker)
- Transfusing E-, c+ compatible blood may elicit an immediate or delayed reaction
Background to our protocol (1)

- Peer reviewed sources:
  1) AABB Technical manual: a much (extensive) peer reviewed text used all over the world as source for developing policies and procedures, and also as an education tool.

2) The risk of alloimmunization to c (Rh4) in R1R1 patients who present with anti-E. Transfusion.
   - 1994 Shirley at al
   - article cited 21 times so far
   - Analysed 100 patients and 32% of R1R1 patients with anti-E had concomitant anti-c.
     - IAT tube method,
     - 18.5% who had anti-E and were transfused E-blood not typed for c antigen developed anti-c.
3) On a much higher than reported incidence of anti-c in R1R1 patients with anti-E. *Immunohematology*
   - Judd et al 2005
   - used gel technology
   - found anti-c in 65% of R1R1 patients who had anti-E

Data strongly support the selection of R1R1 RBS for all c-patients with anti-E.
Our protocol

<table>
<thead>
<tr>
<th>Antibody</th>
<th>Patient Phenotype</th>
<th>Transfuse: non urgent request</th>
<th>Transfuse: urgent request</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anti-E</td>
<td>R₁R₁ (DCCee)</td>
<td>R₁R₁</td>
<td>E- if R₁R₁ not readily available</td>
</tr>
<tr>
<td>Anti-E</td>
<td>Unknown e.g. recent transfusion</td>
<td>R₁R₁</td>
<td>E- if R₁R₁ not readily available</td>
</tr>
<tr>
<td>Anti-E</td>
<td>R₁r (DCcee) R₀r (Dcccee)</td>
<td>E-</td>
<td>E-</td>
</tr>
<tr>
<td>Anti-E</td>
<td>rr (dccee)</td>
<td>rr</td>
<td>rr → majority of Rh(D) neg units are rr</td>
</tr>
</tbody>
</table>

- Proficient testing penalising R₁R₁ protocol
  - on appeal for review, penalty removed
- What are other labs protocols? Should this be addressed in guidelines?
Acknowledgments

- Ms Rosemary Marando, Senior Scientist, Transfusion, Sydpath, St Vincent's Hospital
References


- Shirey, R.S., Edwards, R.E. and Ness, P.M., 1994. The risk of alloimmunization to c (Rh4) in R1R1 patients who present with anti-E. *Transfusion*, 34(9), pp.756-758.