Who’s Your Daddy?
Reasons & Implications for Weak D Testing on Patients

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Weak D Phenotype

- 0.2-1% of Rh-negative individuals
- Red cells reactive with anti-D only at antiglobulin phase
- Quantitative weak D
  - Reduced expression of D antigen
  - Will not make antibody to D antigen
- Partial D Category VI (1% of weak D phenotype)
  - Lack epitopes of normal D antigen mosaic
  - Can form antibody to D antigen
Testing for Weak D

- Weak D Phenotype
  - Human monoclonal anti-D
    - Direct agglutination: negative
    - Incubation at 37°C and antiglobulin reagent: positive \( \pm \) weak D phenotype

- Quantitative Weak D vs. Partial D
  - RhD molecular analysis
  - Specific monoclonal anti-D reagents against epitopes
Testing for Weak D

- Who gets tested routinely?
  - Donor blood
  - Infants of Rh-negative mothers

- Reasons for weak D testing on patients
  - Maternal fetal screen
    - Positivity larger than expected on screen
    - Negative flow cytometry
  - Neonates
Applications

- 3 cases of pregnant females requiring further testing

- All Anti-D testing was done using Biotest Anti-D (RH1) Blend (Seraclone® Human Monoclonal Blend [BS221/BS232/H41 11B7]) Blood Grouping Reagent
Case #1

- 31 year old G4P3 at 36 3/7 weeks
- Vaginal bleeding concerning for placental abruption
- Husband known Rh-negative; no RhIg during pregnancy
- Infant Rh-positive; given RhIg
- Fetal maternal screen positive; flow cytometry negative
- Concern about paternity
- Mother weak D positive; labeled Rh positive
Case #2

- 23 year old G1P0 at 40 2/7 weeks
- Presented in labor; typed Rh-negative
- Significant post-partum hemorrhage
- Infant Rh-positive
- Fetal maternal screen strongly positive; flow cytometry negative
- Mother weak D positive; labeled Rh-negative; given RhIg
Case #3

- 21 year old G1P0 at 30 5/7 weeks
- Involved in motor vehicle accident
- Typed Rh-negative; dog tags listed as Rh-positive
- Re-tested as Rh-negative
- Weak D positive
- Labeled Rh-negative; given RhIg
Assigning Rh Type to Weak D Patients

- Currently no consensus

- At our institution:
  - Mother designated Rh-negative
  - Infant designated Rh-positive
<table>
<thead>
<tr>
<th>Rh type</th>
<th>Transfusion Practice</th>
<th>PRO</th>
<th>CON</th>
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</thead>
<tbody>
<tr>
<td><strong>Positive</strong></td>
<td>Ŷ Give Rh pos blood Ŷ No RhIg</td>
<td>• Avoid wasted resources  • Spare Rh negative RBC units  • No weak D testing of infants  • No RhIg  • Majority will not form antibody to D antigen</td>
<td>• Partial D can form antibody  • May cause confusion in future blood typing  • Wasted resources with repeated weak D testing</td>
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<tr>
<td><strong>Negative</strong></td>
<td>Ŷ Give Rh neg blood Ŷ Give RhIg</td>
<td>• Completely avoid formation of antibody to D antigen</td>
<td>• Wasted resources  • Rh negative blood  • RhIg  • Repeated weak D testing on infants  • May lead to patient confusion</td>
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</tbody>
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Solutions

- Recommend “Rh-negative” designation
  - Completely avoid antibody production
  - Acceptable waste in resources

- Labeled “Rh-positive” risk of antibody production

- Add comment in blood bank result to minimize future confusion
- Write a formal consult for chart
- Add to permanent past medical history
- Send a letter/wallet card to patient
- RhD molecular analysis
Thank You!

QUESTIONS?  COMMENTS??
References

- Daniels, G et al. “Partial D and weak D: can they be distinguished?” Transfusion Medicine, 2007, 17, 145-146.