ABO Typing Discrepancy Essentials

Veronica Talley, AMT

HAABB – FALL Speaker Event

September 19, 2018
Outline

• ABO Discrepancy Rules – Dr. Nicole Draper
• 4 Cases – 4 Possibilities – 4 Explanations
  • Antibody Gain
  • Antigen Gain
  • Antibody Loss
  • Antigen Loss
RULE #1
Weak reactions are usually the discrepant reactions
RULE #2

Antibody problems are much more common than antigen problems.
RULE #3
Check into the patient’s clinical history
CASE #1

**Gel Testing**

<table>
<thead>
<tr>
<th>Anti-A</th>
<th>Anti-B</th>
<th>Anti-D</th>
<th>A₁ Cells</th>
<th>B Cells</th>
</tr>
</thead>
<tbody>
<tr>
<td>4+</td>
<td>0</td>
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**Forward Type**

A+

**Reverse Type**

0

**Tube Testing**

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**RULE #1:** Weak reactions are usually the discrepant reactions

**RULE #2:** Antibody problems are much more common than antigen problems
## CASE #1: Further Testing

<table>
<thead>
<tr>
<th>Cell/Unit #</th>
<th>Tube IS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1 Positive</td>
<td>3+</td>
</tr>
<tr>
<td>A1 Positive</td>
<td>3+</td>
</tr>
<tr>
<td>A1 Negative</td>
<td>3+</td>
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<tr>
<td>A1 Negative</td>
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<td>A2 Cells</td>
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**Antigen Typing:** A1 Positive

### Antibody Screen/Panel

<table>
<thead>
<tr>
<th>Donor</th>
<th>IS</th>
<th>AHG</th>
<th>REST</th>
<th>CC</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1R1</td>
<td>2+</td>
<td>1+</td>
<td>1+w</td>
<td>N/A</td>
</tr>
<tr>
<td>R2R2</td>
<td>3+</td>
<td>1+</td>
<td>1+w</td>
<td>N/A</td>
</tr>
<tr>
<td>rr</td>
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- **Note:** DAT invalid b/c positive saline control, patient’s RBC demonstrated spontaneous aggregation.

- **Cold Auto-Ab:** Incubate RBCs at 37C and washing w/warm saline, testing serum grouping w/adsorbed serum.
Cold Auto-Ab/ Cold Autoimmune Hemolytic Anemia

• IgM autoantibody leads to RBC agglutination at cold temperatures
• Idiopathic or secondary to a variety of diseases
• Clinical severity depends:
  • thermal amplitude
  • antibody’s ability to fix complement and
  • antibody titer
• *Prewarming may mitigate reactivity*

71 y/o man who was admitted for a right frontal lobe contusion and subdural hematoma after falling off a bar stool
Antibody Gain

1. ABO subgroups - 20% A2
2. Cold reacting autoAb
3. Medications – DARA, Anti-CD47
   1. IVIG
   2. MM or Waldenstroms Hypergammaglobulinemia
   3. Transplantation
CASE #2

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- **AB+**

**Reverse Type**

- **A**

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**Forward Type**

- **AB+**

**Reverse Type**

- **O**

**RULE #1:** Weak reactions is usually the discrepant reactions
54-year-old woman (blood type A) who underwent allogeneic stem cell transplant (Donor: Blood Type B) for the primary disease of Multiple Myeloma.
Antigen Gain

1. Transfusion
2. Rouleaux
3. Acquired B
4. (Stem Cell) Transplantation
5. Rare AB phenotype
**CASE #3**

**RULE #1:** Weak reactions are usually the discrepant reactions.

**RULE #2:** Antibody problems are much more common than antigen problems.

**RULE #3:** Check the clinical history.

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**Forward Type**

- O=

**Reverse Type**

- B

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**Forward Type**

- O=

**Reverse Type**

- O
• Level 1 Trauma
• 23-year-old man in a severe MVA transported via EMS
• Received large infusion of IV saline to maintain intravascular volume
Antibody Loss

1. Immunosuppressed
2. Transplantation
3. Age spectrums
4. Dilutional effect
### Case #4

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**Forward Type**

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**Reverse Type**

A

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**Forward Type**

O+

**Reverse Type**

A

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**Rule #1:** Weak reactions are usually the discrepant reactions.

**Rule #2:** Antibody problems are much more common than antigen problems.
Present blood sample taken 3 weeks after the 2\textsuperscript{nd} cycle of chemotherapy

- Possibility of A blood group substance inhibited the reaction with anti-A antiserum

- 48 year-old woman
- Recently admitted for abdominal pain
- CT showed ulcer and mass in the stomach, invading into adrenal gland
- Bx: primary gastric signet ring cell carcinoma
- Completed two cycles of chemotherapy
CASE #4 – Further Testing

Washed - Tube Testing

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Forward Type: A+

Reverse Type: A

- Certain malignancies effect blood groups
  - Pancreatic, Ovarian, Colonic, Bile duct carcinomas
- Neutralization of typing antiserum secreted by the tumor → loss of expression (Ag Loss)
- Apparent vs True Loss
Antigen Loss

1. Leukemia/Lymphoma
2. Transplantation
3. Excessive soluble blood group antigens
   ✓ Pancreatic, stomach and ovarian cancer
4. Recent transfusion of O-units

Sickle Cell patients: RBC Xchange
Massive transfusion
RULE #1
Weak reactions are usually the discrepant reactions
RULE #2
Antibody problems are much more common than antigen problems
RULE #3
Check into the patient’s clinical history
Thank you!
Resources


3. 054: ABO Discrepancies Essentials with Dr. Nicole Draper: [https://www.bbguy.org/2018/08/01/054/](https://www.bbguy.org/2018/08/01/054/)