Transfusion Management of IgA deficiency

Emily Coberly, MD
Medical Director, Transfusion Services
University of Missouri Columbia
Our patient

- 63 year-old female with a duodenal stricture who was admitted with a bowel obstruction due to migrating duodenal stent
- Saturday afternoon, surgery intern calls the blood bank requesting 4 prbcs, 4 plasma and 4 platelets from an IgA deficient donor in preparation for surgery on Monday morning (blood type is AB positive)
- Patient reported to the surgeon a history of IgA deficiency
- Surgery is urgent and can only be delayed an extra day or two at most
Selective IgA deficiency

• IgA deficiency is the most common immunodeficiency in Caucasians (1 in 500 to 700)

• Defined as IgA level < 7 mg/dL in individuals older than 4 years of age
  • Only a minority of patients with selective IgA deficiency are severely deficient (< 0.05 mg/dL)
  • Some patients with severe deficiency have a detectable anti-IgA
Selective IgA deficiency

- In severely IgA deficient patients, transfusion may result in an anaphylactic/anaphylactoid transfusion reaction
  - Anti-IgA may be naturally occurring without history of prior blood product exposure (although role of anti-IgA is unclear?)
  - Anaphylactic reactions can develop after a very small exposure to IgA, and may occur with the first transfusion
- Patients with less severe IgA deficiency (less than 7 mg/dL but greater than 0.05 mg/dL) may also have an increased risk for allergic transfusion reactions

Transfusion. 2015;55(1).
VoxSanguinis. 2014;107(4).
Transfusion options for IgA deficient patients

• Autologous products
• Washed or deglycerolized PRBCs or washed platelets
• Products collected from IgA deficient donors—through the American Rare Donor Program
More history...

• The patient is quite knowledgeable about her medical history
  • She was diagnosed with IgA deficiency at the Mayo Clinic in the 1970s—they told her she can never have a regular blood transfusion or she will have a severe reaction
  • She has never had a blood transfusion in her life
  • She does not have any autologous products available
  • Several months ago she was supposed to have an elective cardiac surgery, but it was cancelled because they could not find appropriate blood products
Labs

- Her hemoglobin was stable but low (around 8 g/dL)
- Her PT/INR were mildly elevated on admission (INR 1.5), but trending down
- Her platelet count was normal (around 240 x 10^9/L)
- Her primary care doctor ordered a celiac panel several years ago which reported an IgA level of less than 7 mg/dL (low sensitivity IgA test)
- We requested a high sensitivity IgA level and anti-IgA testing
- Contacted American Red Cross Rare Donor Program to determine options
Table 1. Guidelines for the distribution of IgA deficient plasma in emergency situations (needed within 4 days*).†

<table>
<thead>
<tr>
<th>History of reaction</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>No history of reaction</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>No IgA level available</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Routine IgA tests—IgA deficient</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Sensitive IgA tests—no IgA</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>IgA present</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>No anti-IgA performed</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Anti-IgA present</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Anti-IgA not present</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decision‡</td>
<td>B, D</td>
<td>A, C</td>
<td>A, C</td>
<td>A</td>
<td>B</td>
<td>B, C</td>
<td>B</td>
<td>A</td>
<td>A, C</td>
<td>A</td>
<td>B</td>
</tr>
</tbody>
</table>

† Each of the columns represents an individual requesting scenario.

‡ Decision Key
A. Release IgA deficient plasma
B. Do not release IgA deficient plasma
C. Ask for a pretransfusion sample for IgA and anti-IgA studies
D. Ask to have a routine IgA level performed locally

American Rare Donor Program. Policy for Distribution of IgA-Deficient Plasma. 4/10/2015.
The plan

• Obtained 2 frozen rare donor units of IgA deficient group A plasma
• Planned for 4 washed PRBCs to be ready on morning of surgery
• Washed platelets were not an option, however we were optimistic that she would not need platelets given her normal platelet count
• Requested limited blood draws/use of pediatric phlebotomy tubes to limit hospital acquired anemia
• Based on lab results, patient was a candidate for IV iron and erythropoietin which were administered to treat her anemia
The plan

• I communicated this plan to the surgeons, and they opted for a less invasive endoscopic procedure rather than an open procedure.

• The main surgery was rescheduled for several weeks later after hemoglobin could be optimized.

• No blood products were required for the endoscopic procedure.
While we were waiting for surgery...

- With IV iron and erythropoietin, hemoglobin improved to normal over several weeks!
- IgA levels returned as undetectable for all subclasses (high sensitivity testing)
- Anti-IgA testing could not be performed, however records were obtained from another hospital which had previously confirmed the presence of an anti-IgA
**Table 2. Guidelines for the distribution of IgA deficient plasma in non-emergency situations (not needed within 4 days*).**

<table>
<thead>
<tr>
<th></th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>19</th>
<th>20</th>
<th>21</th>
<th>22</th>
</tr>
</thead>
<tbody>
<tr>
<td>History of reaction</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>No history of reaction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No IgA level available</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Routine IgA tests—IgA deficient</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Sensitive IgA tests—no IgA</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IgA present</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No anti-IgA performed</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anti-IgA present</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anti-IgA not present</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decision‡</td>
<td>B,C</td>
<td>B,C</td>
<td>B,C</td>
<td>A</td>
<td>B</td>
<td>B,C</td>
<td>B</td>
<td>A</td>
<td>B,C</td>
<td>A</td>
<td></td>
</tr>
</tbody>
</table>

* The 4 day time frame is intended to allow for the time required for rapid shipment of serum samples and high sensitivity IgA and anti-IgA testing. Geographic and transportation circumstances may require more or less than 4 days for results.

† Each of the columns represents an individual requesting scenario.

‡ Decision Key
- A. Release IgA deficient plasma
- B. Do not release IgA deficient plasma
- C. Ask for a pretransfusion sample for IgA and anti-IgA studies
- D. Ask to have a routine IgA level performed locally
Followup

• Because the hemoglobin improved with IV iron and erythropoietin, no transfusions were required perioperatively.

• After the patient was discharged, we received a market withdrawal on one of the units of IgA deficient group A plasma; a subsequent donation had reactive screening tests for anti-HCV and Trypanosoma cruzi antibody; the unit was destroyed.

• The other unit was returned to ARDP.
Summary

• When IgA deficiency is suspected, obtain a detailed patient history and carefully review lab results to determine if specialty products are required
• If the patient has a severe IgA deficiency, consider autologous products, washed products, or products from an IgA deficient donor
• Use blood management strategies to reduce the need for transfusion