Donor Peanut Allergen in Fresh Frozen Plasma: Rare Cause of Transfusion Reaction

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CASE

- 12 yo presenting with diarrhea found to have campylobacter/shiga toxin/cryptosporidium diarrhea and free air on KUB.
- PMHx: Ex-27 week preemie twin, IVH s/p VP shunt placement, G-tube dependent until 5yo, s/p Nissen Fundoplication.
- To the OR for exploratory laparotomy and externalization of her VP shunt.
- She underwent an uneventful general anesthetic and was transported to the ICU intubated with an open abdomen.
- In the OR she received one unit of fresh frozen plasma (FFP) for an elevated INR of 2.88 on admission and surgeon report of oozing during the case.

ICU Course

- She did not receive any additional products during or immediately post-op in the ICU.
- POD#1: Surgical team requested an additional unit of FFP be given for persistently elevated INR. Thirty minutes into the transfusion, the patient was noted to be hypotensive and hypoxic with bilateral wheezing. The transfusion was stopped and the patient was started on an epinephrine infusion for suspected anaphylaxis.
- The patient was weaned quickly from epinephrine over the next 2 hours and her oxygen requirements returned to baseline.
- Hematology was consulted and the offending unit of FFP was sent for testing along with patient blood samples. The patient has a first cousin with IgA deficiency. Patient samples were significant for normal IgA levels, and elevated levels of peanut IgE pre and post reaction (Table 1). After testing by our blood bank, the donor unit was found to have trace amounts of peanut allergen which may have played a role in the anaphylactic reaction.

Discussion

- FFP Transfusion Volumes:
  - 1991 – 2.3 million Units
  - 2001 – 3.9 million Units
  - 2008 – 4.5 million Units
- There is a wide range of adverse reactions to blood products including FFP. These include Transfusion Related Acute Lung Injury (TRALI), Transfusion Associated Circulatory Overload (TACO), Allergic/Anaphylactic Transfusion Reactions (ATR’s), infection, leukocyte-associated risks (graft-versus-host disease, febrile reactions, viruses), red-cell alloimmunization, and hemolytic reactions.
- ATR’s account for <1%-3% of all transfusion reactions and are due to an interaction of preformed antibodies, usually IgE, with an allergen.
- Multiple studies have shown that up to 50% of FFP transfusion may not follow currently published guidelines.
- There are case reports documenting FFP donor peanut allergen causing anaphylaxis in peanut allergic patients.
- Even though this reaction took place in the ICU and resolved without major consequence, anesthesiologists are frequently administering blood products in the operating room and may be exposed to such reactions.
- This case represents an additional cause of transfusion reaction that anesthesiologists should be aware of as well as the need to know what the proper transfusion guidelines are. This may help reduce the overall number of unnecessary transfusions.

Table 1:

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<tbody>
<tr>
<td>Peanut</td>
<td>&lt;0.35 KU Ab Ser Ql</td>
<td>6.64 (g)</td>
<td>6.53 (g)</td>
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<td>Peanut Comment</td>
<td>(NOTE)</td>
<td>NOTES</td>
<td>ALLERGIC TRANSFUSION REACTION (SEVERE)</td>
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<td>IgE</td>
<td>52 - 220 mg/dl</td>
<td>220</td>
<td>141</td>
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References: