



FFP Anaphylaxis Complicating Obstetric Hemorrhage

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Introduction

- Anaphylaxis is a rare but life-threatening hypersensitivity reaction that can occur intraoperatively with incidence of about ~1 in 10,000–20,000 anesthetics.
- Intraoperative anaphylaxis can be difficult to recognize due to overlapping presentation to common anesthesia complications such as hypotension and bronchospasm, and tachycardia
- Other features of anaphylaxis include rash and angioedema
- The most common intraoperative triggers for anaphylaxis includes neuromuscular blockers, antibiotics, latex, chlorhexidine, and less commonly blood products
- The mechanisms of anaphylaxis is an IgE-mediated reaction which leads to mast cell degranulation and release of vasoactive mediators such as histamine, tryptase, leukotrienes, prostaglandins that result in
 - Vasodilation → hypotension
 - ↑ vascular permeability → edema, angioedema
 - Bronchoconstriction → dyspnea/bronchospasm
 - Mucous secretion → airway obstruction
- Rapid recognition is critical due to impending cardiopulmonary collapse
- First line treatment: epinephrine for hemodynamic support, mast cell stabilization, and bronchodilator properties

Case Report

- A 30-year-old G1P0 39w0d female patient with no previous medical history or previous anesthetics presented for induction of labor
- The patient received epidural anesthesia without complication, although secondary to arrest of latent stage of labor, the patient subsequently underwent cesarean section which was complicated by hemorrhage of 4284 L.
- Intraoperatively, the patient received 1g of TXA, hemabate x3, intrauterine pitocin, 1 dose of methergine, 100mcg of rectal misoprostol, and subsequently called for Jada device placement.
- The patient was ordered for 2 units of blood for a hemoglobin of 7.7 with ongoing active bleeding, in addition to 1 unit of cryoprecipitate and 1 unit of FFP
- Upon finishing the FFP, the patient began developing a rash, hives, angioedema, throat burning, difficult breathing, and tachycardia to the 150s with stable blood pressure
- Rapid response was called, patient placed on 6L non-rebreather oxygen mask, received IV hydrocortisone 100mg and IV Benadryl 50mg. Racemic epinephrine was ordered although not received due to improvement of symptoms with IV steroids.



Figure 1: Dermatologic, non-hemodynamic signs of anaphylaxis

Discussion

- Blood transfusions, particularly in the setting of massive transfusion, can cause a host of physiologic reactions that can be life-threatening.
- While less common, transfusion-related anaphylaxis demands prompt recognition and intervention to prevent rapid progression to cardiopulmonary collapse.
- Clinical features of intraoperative anaphylaxis includes:
 - Sudden bronchospasm
 - Hypotension with potential impending circulatory failure
 - Angioedema
 - Tachycardia
 - Hypoxemia/ Hypercapnia
- Commonly triggered by **antibiotics** or **neuromuscular blockers** but may also less commonly result from transfused blood products.
- Management includes immediate administration of **epinephrine**, which provides essential hemodynamic support, stabilizes mast cells, and provides critical bronchodilation.
- Additional supportive therapies include corticosteroids, antihistamines, intravenous fluids, supplemental oxygen, airway management, and vasopressors as needed.
- Anaphylactic reactions following transfusions are most observed in **patients with IgA deficiency**, who develop anti-IgA antibodies and react to donor IgA-containing products.
- FFP and platelets (PLTs) are plasma – containing blood products and are associated with a higher risk of immunologic complications, including allergic reactions, anaphylaxis, transfusion-related acute lung injury (TRALI), and hemolysis¹, with PLTs being the most likely cause of anaphylaxis and FFP anaphylaxis occurring in about 1 in 20,000 transfusions.
- **Anaphylaxis after blood product administration can further complicate high-acuity situations such as hemorrhage**

Conclusion

- Intraoperative anaphylaxis requires prompt vigilance as symptoms can be masked by intraoperative features such as hypotension and bronchospasm
- Prompt recognition of early warning signs such as rash, urticaria, angioedema, dyspnea, tachycardia, and elevated airway pressures, is crucial to prevent rapid cardiopulmonary collapse
- FFP - associated anaphylaxis is rare but can be devastating during moments of rapid transfusion and poses additional life-threatening complications during moments of hemorrhage, such as during obstetric hemorrhage
- FFP and PLTs carry a higher risk of immunologic reactions particularly in patients with underlying IgA deficiency

References

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