

Collaboration between Allergy and Anesthesia

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Dear Editor,

Perioperative immediate hypersensitivity reactions are rare (range of 1:353 to 1:18600 procedures). They are a challenge for the surgical team and especially for the anesthesiologist, who bears most of the responsibility for outcomes. Many drugs, chemicals, and associated procedures play a role in their pathogenesis. Collaboration between specialists in the field of anesthesiology and allergy-immunology is essential for successful evaluation and care of these patients. Allergic and non-allergic mechanisms may be present.¹ Situational awareness is always crucial.² Therefore, managing the patient experiencing perioperative anaphylaxis requires close collaboration between anesthesiologists, surgeons and allergists.³ The European Academy of Allergy and Clinical Immunology (EAACI) are currently promoting this important interaction.⁴

The fact is that the majority of patients safely receive subsequent anesthesia after proper allergic evaluation for their perioperative hypersensitivity reactions, although an elevated baseline serum tryptase level poses an increased risk of recurrent perioperative allergic events. The main culprits are neuromuscular blocking agents, latex, cefazolin and other antibiotics, and dyes.⁵

Any drug or blood product administered in the perioperative period has the potential to produce anaphylaxis. Rapid and timely cardiovascular and pulmonary intervention is required and includes patent airway maintenance, epinephrine administration, and volume expansion correcting the potentially dangerous associated hypotension.⁶ An alternative to intramuscular epinephrine (0.3-0.5 cc of 1mg/mL solution) is to intravenously administer 1-3 cc of 1:10000 aqueous solution (0.1mg/mL) over 10 minutes.⁷ In vitro diagnosis of immediate drug hypersensitivity during anesthesia has mainly been investigated for neuromuscular blocking agents, beta-lactams, latex, and chlorhexidine.⁸

The important causes of perioperative anaphylaxis are as follows: neuromuscular blocking agents, antibiotics, latex, chlorhexidine, blue dyes, opioids, non-steroidal anti-inflammatory drugs, anesthetic agents, plasma expanders,

oxytocin, ethylene oxide, excipients, sugammadex, and blood products. Since the protease “tryptase” is released from the cytoplasm of degranulating mast cells during anaphylaxis, systemic mastocytosis, mast cell activation syndromes, and hereditary alpha-tryptasemia should also be ruled out. An increase of serum tryptase is documented by the formula: baseline tryptase x 1.2 + 2ng/mL. Baseline tryptase can be obtained about 24 hours after the anaphylactic episode. In vitro testing can also include: plasma histamine, urinary methylhistamine, PGD₂, PGF₂-alpha, and LTE₄, and also specific IgE testing (sIgE), basophil activation test (BAT), and histamine release quantified by flow cytometry (HR). However, the gold standard is drug provocation testing (DPT). In vivo skin testing (prick and intradermal tests) is universally used in cases of perioperative anaphylaxis.¹

When a cause is found, an appropriate alternative should be recommended for drug groups with potential cross-reactivity.⁹ Suspected drugs should be investigated and, when proven to be the culprits, they should be avoided and extra monitoring should also be employed for effective management of any potential future anaphylaxis.

Anesthesiologists frequently ask allergists questions like the ones listed below and these should be carefully addressed:

- How can the cause of perioperative anaphylaxis be identified?
- When should surgery be interrupted?
- Which is best, intramuscular or intravenous epinephrine injection?
- How long after an epinephrine injection should another one be considered?
- After the anaphylactic episode, should a post-op intensive care unit be recommended?
- What about future anesthesia?

A close and strong bond should always exist between the surgical and the allergy teams when dealing with perioperative immediate hypersensitivity reactions. One critical factor for successful management of perioperative hypersensitivity is therefore direct and intense collaboration between the anesthetist involved and the allergy teams.¹⁰

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