PBLD Case Skeleton

My department guidelines say I cannot use propofol in a patient with egg allergy! And by the way, my patient has MH.

Moderators: Patrick Fernandez, MD and Scott Markowitz, MD, FAAP

Institution: Children’s Hospital Colorado and University of Colorado SOM

Objectives:
- Understand the implications of food allergies in propofol sensitivity.
- Discuss restrictive departmental policies for medical decision making.
- Consider rational approaches to this challenging set of circumstances.

Case History:

Sammy is an 8-year-old with intolerance to multiple foods and a recent anaphylactic reaction to eating eggs. Sammy is at Children’s Hospital for evaluation by the gastroenterologist and is scheduled for esophagogastroduodenoscopy (EGD) under general anesthesia.

Sammy’s family has a strong history of malignant hyperthermia, with his grandfather and a great uncle both having experienced a perioperative MH event.

Using a non-triggering technique would be routine for Sammy except that a recent guideline published by the Hospital Perioperative Services Multidisciplinary Organization declares that propofol may not be used in a patient with egg allergy.

Question 1: What does the package insert actually tell us about contraindications to propofol?

Question 2: What approach can we take to a clinical guideline that is in conflict with your treatment recommendation? Discuss implications from professional, hospital, legal and patient education perspectives? Do you have an example from your experience where a conflict arose?

You decide to comply with the hospital guidelines, and craft a non-triggering anesthetic using midazolam, ketamine, dexmedetomidine and narcotic. Sammy’s IV induction is uneventful, and the procedure is paused twice as Sammy moves during the endoscopy. After the procedure, Sammy is brought to PACU unconscious and remains unconscious for the next 60 minutes. The PACU nurse calls with concerns that this is very different from their usual patients and wonders what to tell the parents who have not been called to the PACU yet while two other families have already been reunited with the recovering (and awake) children after Sammy.
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**Question 3**: What are the safety and patient satisfaction implications of using an anesthetic technique outside of our common practice?

Ultimately Sammy awakens and continues to remain too sedated to drink, also requiring supplemental O2 for hypoventilation, and is not oriented. You determine that the effects of the ketamine and other anesthetic agents have not worn off enough for discharge and Sammy is admitted to the hospital for observation.

**Question 4**: What are the safety and patient satisfaction implications of unanticipated admission to the hospital? What other costs are there?

By the next morning Sammy is back to normal and discharged after morning rounds without further incident.

**Question 5**: What do we know about allergic reactions to propofol and their causes?

**Question 6**: What types of allergy testing can help to define propofol-reaction risks?

**Question 7**: What is the process to review guidelines at your institution? Does your institution measure guideline compliance? What are the consequences of guideline non-compliance?

**Discussion**:

In clinical medicine, physicians have a long tradition of individualizing care for each patient. Many practices and hospitals are creating more guidelines and protocols designed to limit variability to impact outcomes related to length of stay, cost of care or patient satisfaction. While these outcomes have some merit, they are not the only priorities a patient or physician may have in the choice of clinical approach. When another consideration is in conflict, how can we handle it in a way in which the patient and physician are satisfied and protected from hospital or group-based repercussions?

The example of a patient with anaphylaxis to egg may bring up an important consideration – that not all guidelines are evidence-based and may not be in the patient’s best interest. In crafting an anesthetic, switching technique from the usual to the uncommon can pose new risks and lead to unforeseen consequences.

Propofol was originally formulated using a castor-oil related substance but was withdrawn from the market due to a high rate of anaphylaxis. It was reformulated using its current lipid-based emulsion with new clinical trials in Europe and the
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United States in the mid-1980s and officially introduced to the US market in November of 1989. Despite its new formulation, several new reports of anaphylaxis occurred in the 90s and 2000s. In addition, new reports of Propofol Infusion Syndrome – a non-allergic potentially life-threatening syndrome in patients undergoing long-term treatment with propofol emerged. In 2007, the FDA issued an alert regarding Propofol Infusion Syndrome and revised its label to include this as a warning. This new label also included egg and soy allergy as a contraindication to use.

After the newly listed contraindication, controversy surrounded propofol use in patients with egg and soy allergy. In a study evaluating propofol use in egg allergic children, Murphy et al retrospectively reviewed records of 28 Australian children with egg allergy who received propofol. They noted one non-anaphylactic allergic reaction and concluded that not only is propofol frequently administered to egg-allergic children, but it is also likely to be safe.

While IgE-mediated food allergic reactions are thought to be primarily a response to protein antigens, propofol is formulated with lipid components including 12mg/mL egg lecithin and 100mg/mL soybean oil. Although lecithins and oils are not thought to be highly allergenic, there remains a theoretical risk of cross contamination with soy or egg protein. Several case reports implicated propofol as an IgE-mediated trigger for patients with egg or soy allergy but other studies suggest that propofol is safe in patients with soy or egg allergy.

Propofol’s allergy warning and a conflicting literature raise an important question regarding the use of propofol in children who may have IgE and / or non IgE-mediated food allergies. To complicate matters, there is an increasing prevalence of eosinophilic esophagitis (EoE) – an immune mediated disorder that can be associated with both IgE and non IgE-mediated egg and soy allergies. Children with EoE frequently undergo endoscopies that require anesthesia for management of their disease. The Association of Anaesthetists of Great Britain and Ireland claim that there is no evidence to avoid propofol in egg or soy allergic patients. Additionally, a recent review published by the American Academy of Allergy, Asthma, and Immunology stated that although propofol can cause anaphylactic reactions, the mechanism is likely unrelated to egg allergy.

Reference Literature and overview of articles

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