



Maintaining Ketosis Perioperative for Patients with Refractory Epilepsy

Alex Grieco, MD & Charles T. Barkulis, DO



Introduction/Background

- Starvation has been described as a method to treat seizures since Biblical times.
- In the early 1900s it was discovered that high-fat diets were similarly efficacious in preventing seizures and gained popularity. This treatment fell out of favor with the advent of anticonvulsant drug therapies, but has regained popularity over the last several decades, especially in children with drug-resistant epilepsy (Conover, et al. 2020).
- Many commonly used perioperative oral medications contain a significant amount of carbohydrates, including midazolam, ibuprofen, and acetaminophen.
- Some intravenous medications also contain carbohydrates, including propofol.

Learning Objectives

- A ketogenic diet can be used in conjunction with antiseizure medications to help prevent seizures in patients with refractory seizures and has regained popularity in children with epilepsy.
- Several medications commonly used in the perioperative period contain carbohydrates and should be avoided or used with caution in patients on ketogenic diets for seizure prevention.

Case

- A 3-year-old male presented from home for a left ankle posteromedial release for congenital club foot.
- His past medical history was significant for a NICU admission for poor tone and respiratory effort, requiring noninvasive mechanical ventilation. He then began having myoclonic seizures at 6 months and was found to have a CYFIP2 mutation. He developed refractory epilepsy, but then his seizures were eventually controlled on clobazam, levetiracetam, and a ketogenic diet.
- He had positive urine ketones and had remained seizure free for nearly two years on this regimen.
- His anesthetic plan was discussed, and we proceeded with a mask induction with sevoflurane, placement of a 20-gauge peripheral IV, and placement of a supraglottic airway.
- We avoided the use of carbohydrate containing medications due to the patient's history. He was not given any oral medications prior to surgery. He was administered 350 mL normal saline for the duration of the case. He was administered cefazolin, fentanyl, ketorolac, ondansetron, and dexmedetomidine throughout the case.
- The surgery was uneventful, operative time was seventy-four minutes, and the patient’s supraglottic airway was removed at the end of the case.

Discussion/Conclusions

- Ketogenic and modified ketogenic diets are used to treat patients with drug resistant epilepsy.
- For this to be effective the patient must remain in ketosis.
- Many medications commonly used in the perioperative period are rich in carbohydrates, especially pediatric oral medications and should be avoided, or used with caution in patients on ketogenic diets due to drug resistant epilepsy.

References

- Conover, Zacherie R, et al. “Perioperative Management of Children on Ketogenic Dietary Therapies.” Journals.Lww.Com, Anesthesia and Analgesia, Dec. 2020, journals.lww.com/anesthesia-analgesia/fulltext/2020/12000/perioperative_management_of_children_on_ketogenic.27.aspx.