

## CLINICAL VIGNETTE

---

# Ingestion of Brain Octane Oil

---

William Reid, MD and Balbir Brar, MD

A 48-year-old man was admitted to the hospital with one day of abdominal pain. He had prior medical CVA repair from a cerebellar hemorrhage requiring a craniotomy. He had been doing well from a neurological standpoint and was recovering from his CVA at home with home physical and occupational therapy. At the recommendation of a friend, the patient had recently started taking a supplement called Brain Octane Oil. This supplement was supposed to help in the recovery of patients with brain injuries. Per the manufacturer (Bulletproof Digital, Inc.), the recommended dose is 1 tablespoon. However, the patient stated he took about 10 times that amount in a single serving. That same day he developed new onset vomiting, watery diarrhea, and per his report one episode of bright red blood per rectum, prompting the visit to the emergency department.

On admission, he was completely alert and able to give a clear history. He denied any other ingestions or starting any new medications or supplements other than the Brain Octane Oil. He denied fevers, chills, rash, headache, melena, hematemesis, or coffee-ground emesis. He denied sick contacts, significant recent travel or animal exposure. He denied alcohol, tobacco, or IV drug use and had no significant family history or known drug allergies.

He was alert and oriented in NAD vitals included temperature 98.0 F, blood pressure 119/77 mmHg, pulse 79 bpm, and respiratory rate of 18. Physical exam was essentially normal. Specifically, abdomen was only mildly tender to palpation, diffusely, without focal tenderness, rebound, guarding, or hepatosplenomegaly.

Labs were significant for a white blood count elevation of 16.4 K/ul with 81% neutrophils and a hemoglobin of 12.7 g/dl. Comprehensive metabolic panel, INR, amylase, and lipase were all unremarkable. A urinalysis was unremarkable. A head CT showed stable postoperative changes without acute intracranial hemorrhage, acute territorial infarct, or mass effect. Abdominal-pelvis CT showed enteritis with marked jejunal wall thickening and surrounding fat stranding, mild was thickening of descending and sigmoid colon, and colonic diverticula without evidence of diverticulitis. Admissions ECG was unremarkable.

The patient was admitted for monitoring and additional evaluation by Gastroenterology and General Surgery. With observation and hydration his symptoms resolved and neither

consultant felt invasive intervention was indicated. On the day of discharge the patient's WBC returned normal, he remained afebrile, tolerated feeding without nausea, vomiting, diarrhea, or abdominal pain. He was instructed to stop the Brain Octane Oil and to follow-up with Gastroenterology for any further concerning symptoms.

### *Discussion*

The Bulletproof Diet has recently become more popular for both lifestyle and weight loss. The Bulletproof Diet was created by Dave Asprey. The premise is by eating cleaner, healthier foods and minimizing certain toxins, you can lose weight and increase focus and energy.<sup>1</sup> One basic concept is to start the day with a meal containing fat and caffeine, in a product he calls Bulletproof Coffee. One recommended ingredient in Bulletproof Coffee is a medium chain triglycerides (MCTs). Prior research suggests that a diet including oil with MCTs lead to more weight loss than a diet with Olive Oil<sup>2</sup> and may suppress body fat accumulation.<sup>3</sup> Brain Octane Oil is made of 100% caprylic acid from purified coconut oil and contains 14 grams of caprylic acid per tablespoon. Medium chain triglycerides are often referred to by the number of carbon elements they contain. MCTs are therefore composed of triglycerides ranging in size from 6 carbons (C6) to 12 carbons (C12). Caprylic acid is therefore also known as C8, hence the name Brain Octane Oil. Commercial MCT preparations usually contain various concentrations of the different length MCTs from concentrated MCT Oil and coconut oil.

A friend suggested Brain Octane Oil to help recover from his brain injury. Although there is some evidence that caprylic acid may be neuroprotective,<sup>4</sup> and may reduce seizure incidence as part of the MCT Ketogenic Diet,<sup>5</sup> we were unable to find any medical literature to support the use of MCTs in the setting of traumatic brain injury. Reported side effects are mainly gastrointestinal, with nausea, vomiting, abdominal pain, and diarrhea. One of the authors took a single dose of three tablespoons of Brain Octane Oil and developed epigastric and periumbilical abdominal pain associated with abdominal cramping that lasted 45 minutes. As a supplement, Brain Octane Oil is not approved by the FDA and included "These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease."

It is important for physicians to be aware of new diets and supplements that may be affecting your patient's diseases and interacting with other medications. Patient education about the safety of supplements that fall outside of the FDA approval process is also important. Yearly wellness visits may be a good time to discuss diets and supplements.

## REFERENCES

1. **Asprey, Dave.** The Bulletproof Diet. New York: Rodale, 2014.
2. **St-Onge MP, Bosarge A.** Weight-loss diet that includes consumption of medium-chain triacylglycerol oil leads to a greater rate of weight and fat mass loss than does olive oil. *Am J Clin Nutr.* 2008 Mar;87(3):621-6. PubMed PMID: 18326600; PubMed Central PMCID: PMC2874190.
3. **Tsuji H, Kasai M, Takeuchi H, Nakamura M, Okazaki M, Kondo K.** Dietary medium-chain triacylglycerols suppress accumulation of body fat in a double-blind, controlled trial in healthy men and women. *J Nutr.* 2001 Nov;131(11):2853-9. PubMed PMID: 11694608.
4. **Zhao W, Varghese M, Vempati P, Dzhun A, Cheng A, Wang J, Lange D, Bilski A, Faravelli I, Pasinetti GM.** Caprylic triglyceride as a novel therapeutic approach to effectively improve the performance and attenuate the symptoms due to the motor neuron loss in ALS disease. *PLoS One.* 2012;7(11):e49191. doi: 10.1371/journal.pone.0049191. Epub 2012 Nov 7. PubMed PMID: 23145119; PubMed Central PMCID: PMC3492315.
5. **Wlaź P, Socala K, Nieoczym D, Łuszczki JJ, Zarnowska I, Zarnowski T, Czuczwar SJ, Gasior M.** Anticonvulsant profile of caprylic acid, a main constituent of the medium-chain triglyceride (MCT) ketogenic diet, in mice. *Neuropharmacology.* 2012 Mar;62(4):1882-9. doi: 10.1016/j.neuropharm.2011.12.015. Epub 2011 Dec 17. PubMed PMID: 22210332.

Submitted September 24, 2018