

Consumer Intravenous Vitamin Therapy

Wellness Boost or Toxicity Threat?

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Intravenous vitamin therapy (IVVT) has become increasingly popular in recent years promising to cure or improve a variety of health problems or infuse “wellness.” Patients and consumers have intravenous vitamins or other nutrients and fluids infused into their arms outside the hospital setting in medical spas, hydration rooms, integrative medicine, and concierge primary care practices. The IVVT “menu” options include but are not limited to mixes containing vitamins C and B12, glutathione, electrolytes, and saline. In the United States, the intravenous administration of nutrients is considered drug or parenteral nutrition. In this article, we describe what we learned while trying to answer a question of a patient contemplating an IVVT treatment at a retail store. Discussion of the regulatory issues and pharmacokinetics associated with IVVT is complex and beyond the scope of this article. There is insufficient evidence to conclude there is benefit from these expensive services provided often without the knowledge of the person's primary care physician but there is a possibility of harm. *Nutr Today*. 2021;56(5):234–238

or electrolyte imbalance. There are guidelines for its use, based on evidence-based research, for these types of conditions.^{1–4}

Now, unconventional uses are emerging. Consumers with hopes of having a healthier skin, killing a cold, strengthening their immune system, curing a hangover, or obtaining feelings of wellness can now have IVVT performed in both integrative medicine and concierge primary care clinics as well as in retail locations referred to as drip bars, vitamin infusion or hydration rooms, and medical spas. Consumers may schedule an appointment in the retail locations and receive IVVT without seeing their primary care physician. We did not find evidence-based guidelines for uses such as these for IVVT outside conventional medical settings.

OUR SEARCH FOR INFORMATION

Literature Search

Our literature search yielded almost nothing in terms of primary research about the risks and benefits of providing IVVT outside the hospital setting. Multiple “and” and “or” searches of the medical literature were conducted using a variety of keywords, including “vitamin,” “infusion,” “therapy,” “IV,” “intravenous,” “hangover,” “Myers,” “cocktail,” “safe,” “risks,” and “alternative.” The search of evidence for IVVT yielded 155 articles consisting mostly of case reports or self-reports and uses as adjunctive treatment for cancer, poisonings, dementia, acute kidney disease, trauma, oligohydramnios, and end-of-life care. Most studies had small sample sizes and nonstatistically significant findings. The search specific to hangovers yielded 26 articles, with limited relevance to our topic. We reviewed 1 article describing the Myers' Cocktail, which is promoted in both clinical and retail outlets. “Myers' Cocktail” consists of a mixture of substances, including magnesium, calcium, B-complex vitamins, and vitamin C.^{5,6} See Figure 1 for details. That formulation has been reported to be mixed into a syringe with 20 mL of water and administered for 5 to 15 minutes, but this varies among spas and clinics.⁵ We also reviewed an article characterizing IVVT as practiced in Czechoslovakia, Ireland, Italy, Poland, and the United Kingdom.⁷ Kaminski and coworkers were unable to find information about the quality or reliability of the services but noted IVVT was offered for many conditions including fatigue, immunity enhancement, antiaging, increased physical prowess, management

We were surprised by a question asked by one of our patients: “I read an article on ways to maintain positive, mind, body and soul during COVID. The advice was if we have bad eating habits and do not drink enough water, add an alternative health treatment for the body to our routine—IV vitamin hydration. It's expensive, what do you think?” With the advent of social media to help promote easier and faster communication, new health trends can go viral quickly and “intravenous vitamin therapy” (IVVT) is a recent example of one. Traditionally, intravenous (IV) therapy is used in conventional medical settings for the management of fluids and electrolytes for patients who cannot swallow, are dehydrated, or have other conditions that require timely correction of fluid

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Magnesium chloride hexahydrate 20% (magnesium)	2-5 mL
Calcium gluconate 10% (calcium)	1-3 mL
Hydroxocobalamin 1,000 mcg/mL (B12)	1 mL
Pyridoxine hydrochloride 100 mg/mL (B6)	1 mL
Dexpanthenol 250 mg/mL (B5)	1 mL
B complex 100 (B complex)	1 mL
Vitamin C 222 mg/mL (C)	4-20 mL

FIGURE 1. Nutrients in Myers' Cocktail.

of certain malignancies, and fertility problems.⁷ We did not find comparable articles describing the practices in the United States or Canada.

Google Search

A Google search did not reveal evidence-based studies but did identify many blogs, editorials, personal websites, and names of clinics and businesses that offered “Myers' Cocktail” as well as individualized formulas. Some of these sites such as Healthline⁸ cautioned readers about using such remedies. The websites from some alternative and integrative medicine clinics include descriptions of their patients' experiences. At least 1 integrative medicine clinic (<https://www.gwcm.com/services/myers-cocktail>) included a reference to the article describing the “Myers' Cocktail” and another on fibromyalgia.^{5,9}

There were websites that encouraged entrepreneurs to start their own business by franchising from the parent company “to cash in on this growing niche.”¹⁰ There were

also dozens of websites dedicated to “hangover” cures and kits.

Search for Local Providers of IVVT

Spurred on by our patient's question, we identified medical spas and primary care offices offering these services in our own area. Although we were aware of some nationally recognized athletes and celebrities praising such services, we were surprised to learn they had reached our own backyard—rural eastern North Carolina. Figure 2 presents the menu from the “medical spa” our patient asked about. We were curious what information the potential patient would receive and so called to inquire about an appointment without disclosing any information about our own health conditions. The receptionist said that they would provide an IV infusion of a mixture of vitamins administered by a certified medical professional with a price ranging from \$70 to 180 depending on what we desired. No medical referral was required.

Asking Our Colleagues

We were curious whether our physician, nursing, and nutrition colleagues were as unaware as we were of IVVT. With a few exceptions, those with strong interests in lifestyle medicine, most were like us—unaware. We were told about infusion centers, often on an academic health center campus, that offered IVVT. The treatments offered included both those a patient might receive in the hospital but with more convenience and less cost at an infusion center as well as unproven treatments for conditions such as fibromyalgia, immune support, and hangovers.

Myer's Cocktail (Sometimes also related to Energy Themed Cocktails) – B Vitamins Complex Mix, Vitamin C, Selenium, Calcium, Magnesium, Saline

Vitamin C Themed Cocktail (Ex: Orange Power Up) – Vitamin C, B12, Saline

Hydration Themed Cocktail (Ex: Hydration) – Vitamin C, B12, Saline

Hangover Themed Cocktail (Ex: Hangover Cure) – Ketorolac (or other NSAID), Zofran, Decadron, B Vitamins Complex Mix, Taurine, Glutathione, Vitamin C, Saline, some have Caffeine

Weight Loss Themed Cocktail – Carnitine, Taurine, B Vitamins Complex Mix, Vitamin C, Saline

Immunity Themed Cocktail (Ex: Common Cold Fighter) – B Vitamins Complex Mix, Vitamin C, Zinc, Potassium, Taurine, Saline

Anti-Inflammatory Themed Cocktail – Lipoic Acid, Vitamin C, Glutathione, Magnesium, B Vitamins Complex Mix, Saline

Recovery Themed Cocktail (Ex: Muscle Recovery) – Vitamin C, B Vitamins Complex Mix, Magnesium, Carnitine, Taurine, Arginine

FIGURE 2. Example of menu from a spa offering intravenous therapy in a rural area.

OUR FINDINGS

Claims vs Evidence of Benefit

Benefits

Many people first hear of “drip bars” as a place to obtain relief by having a “hangover bag” filled with saline. These are not the same as the so-called “banana bags” used to treat the rare clinically meaningful vitamin deficiencies seen in patients presenting to the emergency department with alcohol-related illness.¹¹ In a systematic review of hangover cures, IVVT was not mentioned.¹²

The benefit of an IV administration of fluids, vitamins, and minerals is the speed, and the bioavailability of the nutrients is 100% in some instances.¹³ This is different from what happens when you are taking vitamins and minerals orally as dietary supplements, with the micronutrients (particularly the minerals) often not being completely absorbed in the gut.¹³ For example, with an IVVT bag of vitamin C, administered in the hospital, integrative medicine clinic, or hydration room, the vitamin C goes straight to the blood stream, skipping the entire gastrointestinal system. Intravenous fluids are medicines, not dietary supplements, but many of the spas promote them often using the same “structure and function claims” allowed by the Food and Drug Administration on labels for dietary supplements.

Placebo or Too Small a Sample to Detect a Beneficial Effect?

Ali and coworkers⁹ conducted a pilot study to establish the safety and feasibility of treating fibromyalgia with IVVT. The participants reported relief relative to their own baseline pain. Those receiving IVVT reported greater relief, but the difference was not statistically significant among those who received lactated Ringer's solution (a sodium lactate solution used to replace fluids and electrolytes in a person with low blood volume or low blood pressure). Gaby⁵ provides a discussion of the theoretical basis for IV nutrient therapy that many of the current clinics use as their reasoning. He notes that nutrients delivered quickly and at higher concentrations than possible when taken orally may have direct pharmacological effects or that they more effectively correct intracellular nutrient deficits. Gaby⁵ provides case reports of successful treatment of asthma, migraine, fatigue, fibromyalgia, depression, cardiovascular disease, upper respiratory tract infection, narcotic withdrawal, chronic urticaria, athletic performance, and hyperthyroidism with IVVT. He concludes that, although most of the evidence is anecdotal, the “Myers' Cocktail” has been found to be safe by himself as well as hundreds of other practitioners. Gaby⁵ calls on others to report their findings. Alan Gaby,⁵ MD, is a past president of the American Holistic Medicine Association and took over the care of Dr John Myers' patients after his death in 1984. Dr Myers is credited

with pioneering the use of IV vitamin and mineral treatments for various health conditions.

Concerns

Misuse of Scarce Resources

In a 2014 editorial published in the *Journal of Parenteral and Enteral Nutrition*, Chan and colleagues¹⁴ raised concerns about the use of scarce resources—using IV hydration solutions, a prescription medication—for unproven purposes, such as hangovers and colds, over established medical needs. Colleagues working on hospital nutrition support teams note that there always seems to be a shortage of some resources. Currently, there is a shortage of IV multivitamins that is leading to rationing. There is also concern that an IV thiamine shortage may occur.

Risks

Common Risk of IV Therapy

The most common risks in receiving traditional IV therapy include phlebitis, extravasation (damage caused when fluid leaks out of its container into the surrounding tissue during an IV infusion), air embolism, hypervolemia or fluid overload in the body, and infection from the breaking of the skin. It is beyond the scope of this article to describe the dosages and frequency of administration that lead to these risks. Although we did not find reports of major medical adverse consequences from routine use of IVTT, we believe it is appropriate to raise awareness of potential problems. There may be a risk of toxicity of antioxidants and minerals, depending on “how much,” “how often,” and “to whom” they are provided.

Toxicities

Clinical dietitians express concern about the dangers of electrolyte infusion without the benefit of knowing the person's laboratory values, medical conditions, or current medicines and dietary supplements. They voice concerns about the dangers of fluid infusions in specific populations such as individuals with chronic obstructive pulmonary disease, renal failure, or congestive heart failure. In the hospital setting, the need for monitoring the administration by an interprofessional team is recognized and charts are reviewed before administering therapies.

It appears at least from our brief review of websites that the solutions used in integrative and primary care practices are prepared by licensed pharmacies, which would remove the risk of potential toxicities or drug-nutrient interactions. Too much or too little of particular nutrients can do harm. For instance, if you receive mega doses of vitamin C, the body produces more oxalates, which increases the risk of oxalate kidney stones.⁶ However, too little in a person's diet will cause poor wound healing and, eventually, scurvy.⁶

A detailed discussion of the adverse effects of imbalances of specific fluids, electrolytes, minerals, and/or

vitamins is beyond the scope of this article. However, we note a few of the more serious potential adverse effects. Many acute changes in electrolytes, such as overdoses of potassium, can lead to fatal cardiac arrhythmias.¹⁵ Rapid correction of sodium with isotonic saline can lead to brain herniation—a shift of cerebral tissue from its normal location due to factors that cause mass effect and increased intracranial pressure, or pontine stroke—a type of ischemic stroke that affects the pons region of the brain stem. Another concern is increased risk of overhydration or water intoxication, if having weekly IVVT, resulting in confusion, headache, nausea, and vomiting. Rapid accumulation of magnesium can lead to increased neuronal firing, leading to a variety of neurologic symptoms such as confusion, tingling pains, and muscle weakness/tremors.¹⁶ Hypercalcemia leads to kidney stones, bone pains, and constipation. The fat-soluble vitamins (A, D, E, and K) are less easily excreted than the water-soluble vitamins and may present a higher risk of toxicity. Many people do not realize that some water-soluble vitamins also have established upper tolerable limits and may exceed their upper tolerable limit with very large IV amounts being administered, thereby posing an adverse health effect. Vitamin K plays a positive role in the formation of coagulation factors in the blood clotting cascade. With that in mind, some blood thinners can become subtherapeutic as vitamin K levels increase, thereby increasing the risk of clots and sabotaging the intended therapy.⁶ Vitamin A toxicity can cause changes in vision if the liver's capacity to store the vitamin is overwhelmed.⁶

Safety

Under the US law, IV hydration solutions (eg, sodium chloride 0.9%), electrolytes, vitamins, and trace minerals are prescription drugs.¹³ These hydration solutions are to be used for medical purposes and administered by medical professionals. Whereas the websites for integrative medical practices typically list their staff and qualifications including allopathic and osteopathic physicians (MD, DO), Doctor of Chiropractic, naturopathic doctors, registered nurses, physician assistants, and nurse practitioners, other business websites have statements such as “All of our staff are highly trained in the medical field and are experts at placing IVs” or “We employ highly trained practitioners who are licensed or certified.” We were unable to determine whether businesses in all states are required to have a specific licensure or oversight as to who prescribes, prepares, and/or administers the IVVT bag.¹⁴ We found links to online courses on “how to start this business for yourself” or obtain a franchise.^{10,17} It seems that some clinics have a full medical staff and licensed pharmacy; others are owned and registered under a licensed medical professional who may (eg, MD, DO) or may not (eg, Registered Nurse) have prescriptive authority. A medical director with prescriptive authority may or may not be on-site.

CONCLUSION

More oversight and communication between primary care providers and outpatient clinics that provide IVVT conveniently and at a reasonable cost may be helpful for patients who are post-gastrointestinal surgery or have Crohn's disease, ulcerative colitis, or other conditions affecting nutrient absorption. Although Dr Gaby reports that the “Myers' Cocktail” is safe, there are no reports to prove that it or other IVVTs are efficacious. There is insufficient evidence suggesting that IVVT is more effective than eating food or taking dietary supplements to reduce the risks of vitamin and mineral deficiency or support immune health. Our takeaway from this experience is that IVVT sold in the retail space is an expensive and overhyped alternative to oral intake of nutrients and fluids. Frequent use of IVVT may cause critical nutrient imbalances, negative interactions with medications, and/or increased risk of infection. Like Paracelsus, we err on the side of caution with excess and think routine IVVT to people outside the hospital and clinic setting or for “wellness” needs further investigation into the risks and benefits. We reviewed these risks and benefits with our patient and suggested she accept an appointment with a registered dietitian nutritionist to review her typical dietary and fluid intake and create a plan to address any shortfalls with food, beverages, or over-the-counter dietary supplements.

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