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Intravenous Micronutrient Therapy (IVMT)

Intravenous micronutrient therapy (IVMT), and more specifically, the "Myers' Cocktail" (see table I) is a popular treatment modality among NDs and other physicians practicing complementary and alternative medicine. While no exact figures currently exist reflecting the extent of utilization of this modality, a range of national medical associations including The American College for Advancement in Medicine (ACAM), The American Association of Naturopathic Physicians (AANP), the American Holistic Medical Association (AHMA), the American Academy of Pain Management (AAPM), the Great Lakes College of Clinical Medicine (GLCCM) and the International Society of Orthomolecular Medicine (ISOM) report members who routinely treat patients with IVMT. Data obtained by an on-line survey of members of these organizations suggest that IVMT has been widely used for a variety of conditions, most often fibromyalgia syndrome (FMS) and chronic fatigue syndrome (CFS), with reports of consistently positive results: survey data pertains to some reported 12,000 patient experiences²⁵. Despite its popularity, no controlled trials of IVMT efficacy, and only one trial investigating the mechanism of action of the Myers' Cocktail²⁶, have been conducted. At the time of this writing, there is one NIH-funded double-blind, placebo-controlled, randomized trial being conducted on the use of IVMT in the treatment of Fibromyalgia²⁷, but data is not yet available. The exact mechanism of action of IVMT is unknown apart from the effects of the individual constituents.

The use of the Myers' Cocktail was popularized by Alan Gaby, MD. We refer the reader to the article by Gaby, "Intravenous Nutrient Therapy: the Myers' Cocktail"²⁸ in which he discusses his many years of experience using the Myers' Cocktail for the treatment of, among other conditions, status asthmaticus, migraine, CFS, FMS, acute muscle spasm, upper respiratory tract infections, chronic sinusitis, seasonal allergic rhinitis, and cardiovascular disease.

IVMT has the ability to achieve serum concentrations of micronutrients not obtainable with oral or intramuscular administration. The highest serum vitamin C level reported after oral administration of pharmacological doses is 9.3mg/dL, however, IV administration of 50g/day of vitamin C resulted in a mean peak plasma level of 80mg/dL.²⁹ Similarly, oral supplementation with magnesium has been shown to minimally impact serum magnesium levels, whereas IV administration can double or triple the serum levels.³⁰⁻³¹

Much of the benefit of Myers' Cocktail in the treatment of painful syndromes is believed to be derived from the magnesium content.³² Magnesium administered intravenously has been shown to ameliorate pain in a number of conditions.³³⁻⁴⁰ Magnesium is important for over three hundred different enzyme reactions, and

in healthy states, magnesium levels are second only to potassium intracellularly.⁴¹ Magnesium has been found to be low in the serum⁴²⁻⁴³ and erythrocytes⁴⁴ and high in the hair⁴⁵ of FMS patients, suggesting some imbalance of magnesium regulation in this population. Gaby hypothesizes that the reduced levels of intracellular magnesium found in FMS patients plays a role in the etiology, and in order to adequately replenish the cells with magnesium, it is necessary to attain extremely high levels in serum, possible only with IV administration.⁴⁶

Migraine headache appears to share some features with FMS, such as irregularities of serotonin,⁴⁷ extensive dysregulation in pain modulation, and generalized hyperalgesia.⁴⁸ Like FMS patients, migraine patients have been found to have reduced red and mononuclear blood cell magnesium levels.⁴⁹ Two double-blind studies have shown that chronic oral magnesium supplementation may reduce the frequency of migraine headaches,⁵⁰ and one pilot study demonstrated that IV magnesium can resolve an acute migraine.⁵¹ Magnesium concentration plays a role in the modulation of serotonin receptors, nitric oxide synthesis and release, and a variety of other neurotransmitters.⁵²

Reed found parenteral magnesium therapy to have a beneficial effect in treating two groups of patients: those with acute sprains, contusions, or soft tissue injuries, and those with chronic muscular complaints including myofascial pain, relapsing soft tissue injuries and FMS.⁵³

Based on research to date, some conjecture can be made regarding the role of magnesium. However, the roles of the other constituents of the IVMT solution have not been investigated extensively. Nonetheless, vitamin B-12 injected intramuscularly has been used experimentally to treat CFS, a syndrome closely associated with FMS.⁵⁴ In one un-blind trial, 2,500–5,000 µg of vitamin B-12, given by injection every two to three days, led to improvement in 50–80% of a group of people with CFS, with most improvement appearing after several weeks.⁵⁵ It has been suggested that oral or sublingual administration do not achieve the effects seen with injectable B-12.⁵⁶

The potential for adverse reactions from IVMT lies mainly in the method of administration rather than the substance(s) administered.⁵⁷ Any type of IV therapy holds some risk of local effects (hematoma, thrombosis, phlebitis, thrombophlebitis, infiltration, extravastion, local infection, venous spasm) and/or systemic complications (septicemia, circulatory overload, pulmonary edema, air embolism, speed shock, catheter embolism). These complications are rare, and are avoided by using proper technique and thorough screening of patients for whom IV therapy is contraindicated.⁵⁸ There exist reports of allergic reaction to the thiamin (B-1) found in the B-Complex solution. Reaction to thiamin, although extremely rare, most often manifests as a hypersensitivity reaction.⁵⁹⁻⁶⁰ A preliminary test for sensitivity to thiamin is considered “best practice.” Otherwise, there are no known serious side effects of IVMT. Providers of IVMT have not observed other known toxic effects of vitamin and mineral excess with the exception of hypotension due to too rapid a magnesium administration, easily avoided by observation of the patient’s state.⁶¹

Previously, an erroneous belief linked the intake of large amounts of vitamin C with the formation of oxalate-type kidney stones, because of the metabolic conversion to oxalic acid. If the amount of oxalic acid in the urine increases as the dose of vitamin C increases, it was postulated that a prolonged intake of large amounts of vitamin C may cause kidney stones. There exists, however, no data to support this speculation, and in fact, data clearly refutes this idea.⁶² Curhan et al. conducted a fourteen-year long study to examine the association between the intakes of vitamins B-6 and C and risk of kidney stone formation in 85,557 women.⁶³ They found that a high intake vitamin B-6 was inversely associated with risk of stone formation and vitamin C intake was not associated in any way with risk.

Table I- Contents of the Myers' Cocktail

Magnesium chloride hexahydrate (20%)	5 ml
Calcium gluconate (10%)	3 ml
Hydroxocobalamin (1,000 mcg/ml)	1 ml
Pyridoxine hydrochloride (100 mg/ml)	1 ml
Dexpanthenol (250 mg/ml)	1 ml
B-complex 100*	1 ml
Vitamin C (222 mg/ml)	10 ml
Sterile Water	20 ml

*B-Complex 100 contains the following per each ml:

Thiamine HCl	100mg
Riboflavin	2mg
Pyridoxine HCl	2mg
Panthenol	2mg
Niacinamide	100mg
Benzyl Alcohol	2%

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