

Magnesium - A Metal Essential to Life (Part 2)

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Magnesium is a major intracellular ion, along with potassium. It is a cofactor in many enzyme systems and therefore affects almost all organ systems resulting in a broad spectrum of clinical symptoms. It is critical in regulating all electrical activity in the body, smooth muscle contraction, skeletal muscle contraction, brain activity, heart rhythm, and over three hundred various enzymatic reactions.

Clinicians most often encounter magnesium levels in the low range of less than 1.7 mg/dL (normal range 1.7 to 2.2 mg/dL). This can be treated with either oral supplements or intravenously when severe. Since magnesium is stored in bone and interstitial fluid, hypomagnesemia diagnosed via a blood test alone does not necessarily reflect magnesium deficiency.

Excessive magnesium is very rarely encountered, but when present, may result

in central nervous system depression, prolonged cardiac atrioventricular conduction time, cardiac arrest and respiratory arrest. Causes include those that affect renal glomerular filtration rate.

There are many clinically important situations in which hypomagnesemia is encountered including alcoholism, starvation, diarrhea, intestinal malabsorption, lactation, hypothyroidism, acute pancreatitis, aldosteronism, prolonged intravenous feeding, chronic glomerulonephritis, and increased urinary loss. Symptoms include weakness, muscle cramps, arrhythmias, hypertension, neuromuscular irritability, tremors, palpitations, paresthesias (tingling, numbness, or burning pain), confusion and epileptic seizures. It is interesting to note that hypomagnesemia can be seen approximately 30% of the time in cases involving alcohol abuse and 85% of the time when delirium tremens is present in withdrawal.

Magnesium is absorbed orally at about 30% bioavailability from any water soluble salt, such as magnesium chloride or

magnesium citrate. The least expensive soluble (high bioavailability) oral magnesium salt available in supplements is citrate. Magnesium aspartate, chloride, lactate, citrate and glycinate each have bioavailability four times greater than the oxide form and are equivalent to each other per amount of magnesium. To help absorption and decrease the incidence of diarrhea, time released or long acting preparations are better than simple salt.

Serum magnesium levels are ordered only as a follow up to chronically low blood levels of calcium and potassium, and frequently overlooked. Serum tests may be ordered when a person has symptoms that may be due to a magnesium deficiency. Considering the implication of magnesium in so many faculties and diverse roles in the body, it is important to focus on this as much as we think of the other electrolytes. Magnesium is often called the "forgotten cation" and this doesn't have to be the case.

??? Did You Know ???

Individual paths to recovery differ, and packages of treatments and supportive services for mental and substance use disorders should be tailored to fit individual needs. For many people with behavioral health problems the most effective approach often involves a combination of counseling and medication. Supportive services, such as case or care management, can also play an important role in promoting health and recovery. Treatments and supportive services are provided in a variety of locations, including: specialty community behavioral health centers, substance use disorder rehabilitation programs, independent providers, hospitals, community health centers, mutual support groups and peer-run organizations, community-based organizations, and schools.

Source: SAMHSA

Question of the Month

Question: "What does it mean when a sample is Hemolyzed?"

Answer: Hemolyzed samples contain blood cells that have broken open and released the cellular content into the serum. This cellular content interferes with most testing procedures. It releases proteins that interfere with antibody/antigen immunoassay reactions. In addition, it causes a release of chromogenic material that interferes with spectrophotometric assays. In samples where the cellular components are being measured, as in a CBC, any decomposition of these cellular components reduces the number measured. Further, when the cell wall breaks open releasing its contents, the cell wall can be mistakenly detected as cellular components themselves, such as platelets. In general, hemolysis is the first stage in decomposition of the sample, and it indicates the difference between a sample that is fresh and can be analyzed versus a sample that is in various stages of decomposition and cannot be analyzed accurately.