

Magnesium - Antioxidant Status - Glutathione / First of a series of three / feedback welcome

Subject: Magnesium - Antioxidant Status - Glutathione / First of a series of three / feedback welcome

From: "Mark Sircus Ac., OMD" <director>

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Magnesium - Antioxidant Status - Glutathione

The involvement of free radicals in tissue injury induced by Mg deficiency[i] causes an accumulation of oxidative products in the heart, liver, kidney, skeletal muscle tissues and in red blood cells.[ii] Magnesium is a crucial factor in the natural self-cleansing and detoxification responses of the body. It stimulates the sodium potassium pump on the cell wall and this initiates the cleansing process in part because the sodium-potassium-ATPase pump regulates intracellular and extracellular potassium levels. Cell membranes contain a sodium/potassium ATPase, a protein that uses the energy of ATP to pump sodium ions out of the cell, and potassium ions into the cell. The pump works all of the time, like a bilge pump in a leaky boat, pumping K⁺ and Na⁺ in and out, respectively.

Potassium regulation is of course crucial because potassium acts as a counter flow for sodium's role in nerve transmission. The body must put a high priority on regulating the potassium of the blood serum and this becomes difficult when magnesium levels become deficient.[iii] Because of these crucial relationships, when magnesium levels become dramatically deficient we see symptoms such as convulsions, gross muscular tremor, athetoid movements, muscular weakness, vertigo, auditory hyperacusis, aggressiveness, excessive irritability, hallucinations, confusion, and semicomma. Magnesium deficiency causes the body to lose potassium. Magnesium and potassium inside the cell assist oxidation, and sodium and calcium outside the cell wall help transmit the energy produced. The healthy cell wall favors intake of nutrients and elimination of waste products and this is one of the reasons magnesium is so important in detoxification and chelation.

Magnesium protects cells from aluminum, mercury, lead, cadmium, beryllium and nickel, which explains why re-mineralization is so essential for heavy metal detoxification and chelation. Magnesium protects the cell against oxyradical damage and assists in the absorption and metabolism of B vitamins, vitamin C and E, which are anti-oxidants important in cell protection. Recent evidence suggests that vitamin E enhances glutathione levels and may play a protective role in magnesium deficiency-induced cardiac lesions.[iv] Magnesium in general is essential for the survival of our

cells but takes on further importance in the age of toxicity where our bodies are being bombarded on a daily basis with heavy metals. Magnesium especially is needed to protect the brain from toxic effects of chemicals. It is highly likely that low total body magnesium contributes to heavy metal toxicity in children and is a strong participant in the etiology of learning disorders and autism.

Dr. Andrew Hall Cutler, in his book *Amalgam Illness Diagnosis and Treatment*, suggests taking 100 mg magnesium equivalent with each meal and 100 at bedtime to start, and increase this to 200 with each administration. For certain conditions like rheumatoid arthritis and heart pain he suggests taking as much magnesium as you can tolerate. But in general his recommendation for magnesium is 500-750 mg elemental equivalent per day. Dr. Cutler also maintains that magnesium citrate is a very mild chelating agent and does have the ability to reduce brain fog in some people.

Without sufficient magnesium, the body accumulates toxins and acid residues thus it degenerates more rapidly and ages prematurely. Recent research has pointed to low glutathione levels being responsible for children's vulnerability to mercury poisoning from vaccines.[v] It seems reasonable to assume that low levels of magnesium would also render a child vulnerable. And in fact glutathione requires magnesium for its synthesis.[vi] Glutathione synthetase requires γ -glutamyl cysteine, glycine, ATP, and magnesium ions to form glutathione.[vii]

In magnesium deficiency, the enzyme γ -glutamyl transpeptidase is lowered.[viii] Data demonstrates a direct action of glutathione both in vivo and in vitro to enhance intracellular magnesium and a clinical linkage between cellular magnesium, GSH/GSSG ratios, and tissue glucose metabolism.[ix] Magnesium deficiency causes glutathione loss, which is not affordable because glutathione helps to defend the body against damage from cigarette smoking, exposure to radiation, cancer chemotherapy, and toxins such as alcohol and just about everything else.

According to Dr. Russell Blaylock, low magnesium is associated with dramatic increases in free radical generation as well as glutathione depletion and this is vital since glutathione is one of the few antioxidant molecules known to neutralize mercury.[x] Thus, sadly, children receiving thimerosal containing vaccines are sitting ducks to mercury when both magnesium and glutathione levels are low. Also under the shadow of magnesium deficiency too much Nitric Oxide (NO) is produced which in turn may react with superoxide to form a very damaging compound peroxynitrite. Low magnesium levels can induce such excessive NO production that even the glutathione in the red blood cells is damaged. This provides some one explanation for why magnesium protects the arteries.[xi]

"For every molecule of pesticide that your body detoxifies, you throw away or use up forever, a molecule of glutathione, magnesium and more," says Dr. Sherry Rogers who goes on to say that, "Your body uses nutrients to make this glutathione and it uses up energy as well. Every time we detoxify a chemical, we use up, lose, throw away forever, a certain amount of nutrients."

Magnesium permits calcium to enter a nerve cell to allow electrical transmission along the nerves to and from the brain. Even our thoughts, via brain neurons, are dependent on magnesium.
Dr. Carolyn Dean

When dealing with autism spectrum and other neurological disorders in children it is important to know the signs of deficient magnesium: restlessness, can't keep still, body rocking, grinding teeth, hiccups, noise sensitive, poor attention span, poor concentration, irritable, aggressive, ready to explode, easily stressed. When it comes to autistic children today we need to assume significant magnesium deficiency for multiple reasons.

1) The foods they are eating are stripped of magnesium because of soil deficiencies in vital minerals.

2) The foods many children eat are highly processed junk foods that do not provide real nutrition to the body.

3) Children on the autistic spectrum are not absorbing the minerals they need even when present in the gut. Magnesium absorption is dependent on intestinal health, which is compromised in leaky gut syndromes.


4) The oral supplements doctors rely on are not easily absorbed.

Magnesium and copper are important modulators of NMDA-receptor activity. Recent data indicate that disturbances of glutamatergic transmission (especially via NMDA-receptor) are involved in pathogenesis of mood disorders. Magnesium deficiency is related to a variety of psychological symptoms especially depression. There are many reports indicating significant changes in blood levels of magnesium or copper during a depressive episode. Moreover magnesium exhibits antidepressant-like and anxiolytic-like effects in animal models of depression, in rodents.[xii]

Evidence is mounting that low levels of magnesium contribute to the heavy metal deposition in the brain that precedes Parkinson's, multiple sclerosis and Alzheimer's. Many of the symptoms of Parkinson's disease can be overcome with high magnesium supplementation. In a trial with 30 epileptics 450 mg of magnesium supplied daily successfully controlled seizures. Another study found that the lower the magnesium blood levels the more severe was the epilepsy.
Magnesium works best in combination with vitamin B6 and zinc.

Because of its nerve and muscle support, magnesium is helpful for nervousness, anxiety, insomnia, depression, and muscle cramps. Thus magnesium is also given as part of a treatment for autism or hyperactivity in kids. Dr. Bernard Rimland, of the Autism Research Institute, did extensive research on vitamin B6 and magnesium many years ago and found, through double-blind placebo-controlled crossover experiments with 16 autistic children, statistically significant results. Children and adults tend to sleep better when taking magnesium before bed.

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