

# **THE CLINICAL IMPACT OF NATURAL MEDICINE AND MAGNESIUM DEFICIENCY**

## **Part 2 of 2 Articles**

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Magnesium was first discovered in huge deposits in Greece. Magnesium sulfate, known today as Epsom salts, was used in ancient times as a laxative, and still is to this day. A 1697 medical paper titled “Treatise on the Nature and Use of the Bitter Purging Salt Contained in Epsom and Such Other Water” recommended magnesium for health problems as varied as skin ulcers, depression, vertigo, heartburn, worms, kidney stones, jaundice, and gout. Most of these problems are still treated with magnesium and current research supports its use for many of those conditions along with a long list of other ailments.

### **Causes of Magnesium Deficiency: The Magnesium Burn Rate**

It is quite a shock to see all the ways that magnesium can become depleted or burned off. We talk about most of these magnesium deficiency factors throughout this article.

However, the following list of twenty-six major causes of magnesium deficiency is a good summary and bears repeating so you can truly understand what we are up against in our magnesium-depleted world.

1. Athletic performance
2. Alcohol
3. Antacids
4. Acid rain
5. Caffeine
6. Most pharmaceutical drugs

7. Fertilizers
8. Fluoride
9. Food processing
10. Herbicides
11. Pesticides
12. Intestinal Disease
13. Junk Foods
14. Meat from animals eating magnesium-depleted food
15. Oxalic Acid from spinach, swiss chard
16. Low Potassium
17. High protein
18. Refining grains
19. Sauna therapy
20. Soil on farmland
21. Soil erosion
22. Stress or trauma
23. Stomach acid
24. Tannins
25. Trans fatty acids and mineral deficiency
26. Water softening

Why should this story matter to you? Because deficiencies in magnesium are so widespread that possibly three out of four readers of this newsletter are lacking this essential nutrient.

In fact, surveys have shown that of the 75 percent of people who don't get enough magnesium, two-thirds are severely deficient. And virtually all diabetics are deficient. Yet despite these sky-high deficiency rates and the critical nature of magnesium for human health, it is not included in routine blood work, even for seriously ill patients.

Worse still, most physicians don't even know how to evaluate magnesium, because 99 percent of this vital nutrient is located within the cells. Only 1 percent circulates in the blood—which means that blood tests for magnesium tell us very little about the actual amount in our bodies.

***Indeed, numerous studies have shown that a person can have perfectly normal blood magnesium levels, yet still be seriously deficient. It is difficult to get most doctors to understand this.***

### **Magnesium Depletion is Deadly**

Magnesium is critical for the function of hundreds of enzymes, many of which supply energy to the brain as well as the body. It also regulates the neurotransmitter glutamate, which, when overactive, causes seizures and brain injury.

Because magnesium levels naturally decline as we age, an elderly person's levels are already low. If doctors then administer intravenous water, magnesium becomes further diluted. This can trigger seizures and loss of consciousness.

Another common cause of magnesium depletion, especially among young people, is vigorous exercise. Studies have shown that intense exercise redistributes magnesium from inside the cells to the plasma, (a component of blood in which the cells are suspended), where it is

eliminated from the body by the kidneys and by the process of sweating.

Over time, even normal, consistent exercise can deplete the body of magnesium. Low levels can make the heart muscle irritable and leave a person prone to sudden cardiac death.

But it's not just the young and the elderly who are at risk. A close friend of mine, who was a very health conscious, athletic person in early 40s, died suddenly from an uncontrollable arrhythmia while playing racquetball.

Only the week before his death, it was suggested that he take magnesium supplements, but he insisted that he got all the nutrients he needed from his diet. If only he had listened to my advice.

Because of the blood brain barrier (the separation of blood and brain extracellular fluid), the brain is slow to replace lost magnesium. It can take as long as six months to replace brain magnesium by using oral supplements, but magnesium can be replaced intravenously within hours.

This is why it is good idea to take magnesium supplements now, before a medical disaster occurs.

### **Magnesium Protects Against Mental Deterioration**

Because magnesium reduces brain inflammation, improves brain energy levels, and protects against excitotoxicity (a process by which nerve cells are damaged or killed through excessive stimulation by neurotransmitters), researchers examined serum magnesium levels in 37 patients with Alzheimer's disease and compared them to 34 control patients of matched age and other similar variables. They found a significantly lower magnesium level among those with Alzheimer's disease than the control patients.

Using a test for rates of mental deterioration (called the Global Deterioration Scale), the researchers found a statistically significant inverse relationship between low magnesium levels and mental deterioration. That is, the higher the magnesium, the less rapidly the subjects' mental capacity deteriorated due to disease.

There is currently a great deal of interest among brain scientists concerning the ability of magnesium to protect the brain against vascular diseases (strokes and small vessel disease of the brain), Alzheimer's, Parkinson's, and Lou Gehrig's disease (ALS). All of these disorders are associated with excitotoxicity and immunoexcitotoxicity, which occurs when the brain's immune cells (microglia) cause inflammation in response to contact with toxins.

### **Magnesium Stops Seizures**

It has been recognized for years that magnesium depletion can cause seizures in animals and humans. While some studies suggest that magnesium supplementation can reduce seizures, the research results are somewhat mixed.

The problem with these negative studies is that they did not take into account other factors – such as a high intake of dietary excitotoxin— and often used a dose of magnesium that was too low. Many such “exonerating” studies also did not consider the difficulty of getting magnesium into the brain over a short period of time.

On the other hand, studies that used magnesium, vitamin B6, and other antioxidants and anti-inflammatories were much more credible. I have treated a number of seizure patients with these combinations. Many patients treated in such a way have been able to discontinue all anti-seizure medications and yet remained seizure-free for many years.

A combination of magnesium and vitamin B6 can also improve Tourette's syndrome, a neurological problem that is very difficult to control. A recent study used this combination in children aged 7 to 14 who had Tourette's. After treatment started, they were regularly tested on days 15, 30, 60, and 90. Their total tic score fell from 26.7 to 12.9, and their tic severity (These scores measure the number of facial and body tics a person has, and how severe the tics are). Best of all, there were no side effects from the treatment,

These results were equal to those seen using powerful medications, which are known to have a number of significant side effects. It is also interesting to note that in animal studies combining magnesium with Vitamin B6 was also the most effective combinations to stop seizures.

### **Magnesium, Insulin Resistance, and Diabetes**

In experiments, magnesium deficiency has also been shown to cause insulin resistance, a condition in which the hormone insulin becomes less effective at lowering blood sugar. This leads to a number of diseases, including Type 2 diabetes. Insulin resistance is also linked to Alzheimer's disease, and may have a damaging effect on normal brain function.

Virtually, all diabetics are magnesium deficient. This deficiency is also strongly linked to metabolic syndrome – a combination of medical conditions that raises the risk of cardiovascular disease and diabetes – which affects over 50 million Americans.

In the past, it was thought that brain cells didn't need insulin, but now we know better. Elevated insulin levels can trigger inflammation in the brain, which leads to an increased risk of several neurological disease. Supplementing with magnesium allows insulin to return to normal levels.

Human studies have also shown that magnesium deficiency increases the risk of diabetes and complications from diabetes, including

peripheral neuropathy, which causes burning pains in the limbs as well as weakness.

One interesting study found that magnesium supplements improved insulin resistance even in people with normal blood magnesium levels who did not have full blown diabetes.

The people on a magnesium supplement developed lower blood sugar levels and showed improved insulin sensitivity.

Improving insulin sensitivity is important because elevated insulin resistance increases one's risk of cancer. Alzheimer's disease, Parkinson's disease, autonomic neuropathy (with severe stomach and sexual dysfunction), peripheral neuropathy, and vascular diseases including stroke and small vessel diseases of the brain.

### **Magnesium Works as an Antidepressant**

Several studies – in both animals and humans – have shown that magnesium has an antidepressant effect. This makes sense in light of the new findings that the most severe type of depression is caused by a combination of brain inflammation and excitotoxicity. Magnesium reduces both brain inflammation and excitotoxicity.

Researchers George and Karen Eby found that chronically depressed patients recovered rapidly when given supplementary magnesium. In a later study they found that magnesium was especially effective for treatment-resistant depression – depression that was not helped by any combination of pharmaceutical drugs.

They quote studies that found low brain magnesium levels (measured in cerebrospinal fluid) in people with suicidal thoughts and in patients who had attempted suicide. There was also a strong correlation between low brain magnesium levels and treatment-resistant depression.

Depression is common among diabetics, because the disorder causes inflammation throughout the body, even in the brain. In one study, researchers found that newly diagnosed depressed patients with Type 2 diabetes were often low in magnesium.

Patients received either a magnesium supplement or a common antidepressant (imipramine). The magnesium supplement was shown to be as effective as the powerful antidepressant drug in relieving the depression without any of the drug's side effects, which include seizures, dizziness, hypertension, vomiting, and acute renal failure.

If magnesium is as effective as pharmaceutical medications for major depression, why do physicians resort to these often dangerous drugs? Once again, it is mainly because magnesium is dirt=cheap, so there is little profit. As a result, this information is kept from practicing physicians.

### **Magnesium Is an Effective Pain Reliever**

Extensive research into the mechanism of acute and chronic pain clearly indicates that it, too, is caused by immunoexcitotoxicity. We've known for some time that inflammation greatly increases pain, but we've only recently learned that it is a major mechanism for all types of pain.

For example, if I were to operate on a healthy person's back while they were fully awake and expose the nerves going to the legs and take one of those nerves and squeeze it, this would not cause pain, only an intense tingling. However, if that nerve was inflamed, squeezing it would cause excruciating pain down the leg. We see this mechanism in people with a ruptured disc, who have inflamed nerves by the disc.

Chronic pain is real mystery, especially pain that persists once the original cause has been cured. Shingles is an excellent example. Some victims of shingles have severe pain that persists for years. What we



have learned is that, in these cases. The pain is not in the nerve itself, but rather is located in the area of the spinal cord that nerve enters.

Here one sees very complicated networks of nerve fibers, many of which use glutamate as a neurotransmitter. Studies have shown that when glutamate levels are high in this part of the spinal cord, people will have chronic pain. But if you block the glutamate receptor, the pain will be relieved.

Inflammation makes this receptor much more sensitive; this is what causes pain. Blocking both the inflammation and the glutamate receptors gives dramatic pain relief.

Based on these new understandings of pain, some doctors have been suing magnesium to reduce discomfort following major operations. For example, in one study of patients who had thoracotomies (chest surgery), giving a high dose of magnesium during the surgery, followed by adding magnesium to the IV during the first 24 hours after surgery, significantly reduced the amount of anesthesia needed during surgery and reduced the patient's need for pain medications after surgery.

Other studies have shown similar results with magnesium to reduce the need for analgesics (pain relievers) before and after surgery.

Yet the benefits of magnesium go beyond pain relief. Studies have shown that it also greatly reduces the risk of using anesthetics and cuts down on complications associated with anesthesia.

One study found that giving magnesium during surgery reduced the release of catecholamines ("fight-or-flight" hormones released by adrenal glands) when a breathing tube is inserted. This cuts the risk of patients experiencing a heart arrhythmia during surgery, which can be fatal.

Another use of magnesium is for people who suffer from what is called complex regional pain syndrome, a chronic, progressive disease that

can make life miserable. In one study, researchers gave eight such patients magnesium infusions for five days and found that their pain was significantly reduced and their quality of life impaired.

Though most people don't know much about magnesium, this common mineral can save your life and prevent a lot of misery.

It is truly a miracle nutrient!

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