

Health Bits and Pieces (HFN 31:2)

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Minerals and Health Department

Many people have a deficiency of the mineral magnesium. Among its many functions in our physiology, magnesium is a hardness factor in bones and keeps muscles flexible. Magnesium is found in dark leafy greens (it's in chlorophyll), nuts and seeds, beans and lentils, whole grains, avocados and dried fruit. Sugar and alcohol deplete magnesium. Magnesium is involved in at least 300 biochemical reactions in the body. A deficiency in magnesium can lead to muscle spasms, cardiovascular disease, high blood pressure, anxiety disorders, migraines, osteoporosis, diabetes, and cerebral infarction.

Magnesium for the Brain

Magnesium and PTSD. Symptoms of post-traumatic stress disorder, or PTSD, can be very persistent. Even early childhood trauma can in some cases persist for decades or even a person's entire lifespan. Low brain levels of magnesium have been associated with various types of cognitive disorders including depression. Magnesium threonate has been found to enhance adaptability in the part of the brain that is responsible for judgment, learning, and memory and that allows changes in the learned fear response.

Abumaria N, Yin B, Zhang L, et al., "Effects of Elevation of Brain Magnesium on Fear Conditioning, Fear Extinction, and Synaptic Plasticity in the Infralimbic Prefrontal Cortex and Lateral Amygdala," The Journal of Neuroscience (2011) 31(42): 14871-14881; doi: 10.1523/JNEUROSCI.3782-11.2011.

Magnesium for Pain (and Migraine)

Individuals who suffer from migraines have been found to be deficient in magnesium. Magnesium supplementation has been found to be an effective way to deal with the recurrence of migraines.

Mauskop A, Varughese J, "Why all migraine patients should be treated with magnesium," Journal of Neural Transmission, 2012 May;119(5):575-9; doi: 10.1007/s00702-012-0790-2. Epub 2012 Mar 18.

Magnesium for the Heart: Cardiovascular Health

A recent review of cardiovascular disease research studies finds that low magnesium levels – not cholesterol or saturated-fat intake – are the greatest predictor of all aspects of heart disease. Magnesium protects the coronary arteries, relaxes spasms including angina pain, helps to regulate heart rhythm, relaxes stress on the sympathetic nervous system and modulates blood pressure, also through sympathetic regulation.

Teo KK, Yusuf S, "Role of magnesium in reducing mortality in acute myocardial infarction. A review of the evidence," Drugs, Vol. 46, pp. 347-359, 1993; Teo KK et al., "Effects of intravenous magnesium in suspected acute myocardial infarction: overview of randomized trials," British Medical Journal, Vol. 303, pp. 1499-1503, 1991; Shechter, Michael, et al., "Oral magnesium therapy improves endothelial function in patients with coronary artery disease," Circulation, Vol. 102, November 7, 2000, pp. 2353-58; Ford, Earl S., "Serum magnesium and ischaemic heart disease: findings from a national sample of US adults," International Journal of Epidemiology, Vol. 28, August 1999, pp. 645-51; Onalan, O, et al., "Meta-analysis of

magnesium therapy for the acute management of rapid atrial fibrillation,” American Journal of Cardiology, Vol. 99, June 15, 2007, pp. 1726-32.

It also makes the bones hard.

Magnesium and testosterone. Age-related testosterone may be a natural deterioration, but it is not necessarily beneficial. Low levels of testosterone are linked to a decrease in muscle mass, changes in blood lipids (including higher cholesterol levels), and increased bone fragility. A recent study found that increasing levels of magnesium can increase testosterone production. This effect can be augmented when magnesium supplementation was combined with exercise.

Cinar V, Polat Y, Baltaci AK, Mogulkoc R, “Effects of Magnesium Supplementation on Testosterone Levels of Athletes and Sedentary Subjects at Rest and after Exhaustion,” Biological Trace Element Research (2011), 140(1): pp 18-23.

Another important mineral in the diet is lithium

Pharmaceutical lithium is recognized as a treatment for bipolar disorder but most people are not aware that it is also a nutrient mineral. Lithium is found in foods such as grains and vegetables; in some areas, the drinking water also provides significant amounts of the element. Dietary lithium intake depends on the geographical location and the type of foods consumed with a wide range of variability. In animal studies conducted from the 1970s to the 1990s, rats and goats maintained on low-lithium rations were shown to exhibit higher mortality as well as reproductive and behavioral abnormalities. In humans, lithium deficiency diseases have not been clearly identified; but low lithium intake from water supplies has been associated with increased rates of suicide, homicide, and the arrest rates for drug use as well as other crimes. Lithium appears to play an especially important role during early fetal development based upon detection of the high lithium contents of the embryo during the early gestational period. The available experimental evidence now appears to be sufficient to accept lithium as an essential nutrient. A provisional RDA for a 70 kg adult of 1,000 micrograms/day is suggested.

Mental disorders of all kinds, from bipolar syndrome to depression to OCD, can benefit in some way from lithium. Lithium orotate has been shown to reduce manic episodes in bipolar disorder. Lithium orotate also seems to have a beneficial effect on regulating brain neurotransmitters.

Nieper HA, “The clinical applications of lithium orotate. A two years study,” Agressologie (1973) 14(6):407-411; Sartori HE, “Lithium orotate in the treatment of alcoholism and related conditions,” Alcohol (1986) 3(2):97-100; O'Donnell T, Rotzinger S, Ulrich M, Hanstock CC, Nakashima TT, Silverstone PH, “Effects of chronic lithium and sodium valproate on concentrations of brain amino acids,” European Neuropsychopharmacology 2003, 13(4):220-227; Schrauzer GN, “Lithium: occurrence, dietary intakes, nutritional essentiality,” Journal of the American College of Nutrition (2002) 21(1):14-21.

Drugs and Disease Department:

Toxic Effects of Statins

One of the most common toxic effects of statin use is myopathy, muscle pain, and weakness. Statins inhibit the HMG CoA reductase enzyme, the same pathway that participates in the production of both cholesterol and coenzyme Q-10. Since CoQ-10 is absolutely vital to mitochondrial function and energy production, CoQ-10 depletion may contribute to

mitochondrial dysfunction, thus perhaps leading to myopathy. Statins deplete the natural production of coenzyme Q-10 in the liver by its inhibitory effect on liver biosynthesis.

Fedacko J, Pella D, Fedackova P. et al., "Coenzyme Q₁₀ and selenium in statin-associated myopathy treatment," Canadian Journal of Physiology and Pharmacology, (2013) 91(2): 165-170, 10.1139/cjpp-2012-0118.

The use of statins appears to be associated with an increased risk of musculoskeletal injuries, including an increased risk of dislocations, strains, and sprains, according to a new analysis. Researchers suggest the full range of musculoskeletal adverse events might not be fully known and that further studies are needed, especially in active individuals. "These findings are concerning because starting statin therapy at a young age for primary prevention of cardiovascular diseases has been widely advocated," reports Dr. Ishak Mansi (VA North Texas Health Care System, Dallas) and colleagues in a paper published online June 3, 2013, in the *Journal of the American Medical Association: Internal Medicine*.

Mansi I, Frei CR, Pugh MJ, Makris U, Mortensen EM, "Statins and musculoskeletal conditions, arthropathies, and injuries," JAMA Internal Medicine 2013; Vol 173, No. 10; DOI:10.1001/jamainternmed.2013.6184.

A medication that actually feels good

Ginseng for Cancer Prevention

American ginseng (*Panax quinquefolius*) has been shown to reduce inflammation. The typical American diet results in high levels of systemic inflammation and is associated with an increased risk of developing colon cancer. American ginseng supplementation can prevent or delay the occurrence of colon cancer by its anti-inflammatory and immune-boosting properties.

Dougherty U, Mustafi R, Wang Y, et al., "American ginseng suppresses Western diet-promoted tumorigenesis in model of inflammation-associated colon cancer: role of EGFR," BMC Complementary and Alternative Medicine (2011) 11:111 doi:10.1186/1472-6882-11-111.