Magnesium:

The Underappreciated Mineral of Life Part II

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Diagnosing Magnesium Deficiency

Although physicians diagnose many metabolic deficiencies through blood tests, this is rarely reliable with magnesium. While 60% of magnesium exists in our bones, and 39% inside our 60 trillion cells, less than 1% of total body magnesium is found in the blood. Numerous studies have shown that there is a poor correlation between blood magnesium levels and the more relevant (but difficult to reliably test for) intracellular levels. Total body magnesium levels may decrease 20% during a fast, with no change in blood levels. Very low blood magnesium levels may correctly indicate a serious total body magnesium deficiency; however, a normal magnesium blood level may exist despite a serious intracellular magnesium deficit.

Thus a normal magnesium blood test really proves nothing, as J.H. Laragh, M.D. and Mildred Seelig, M.D. (one of the worlds greatest magnesium experts) note: Since no reliable test of tissue magnesium levels is currently available, and since magnesium supplementation products have a therapeutic window with predictable results in both correcting magnesium deficiency and prophylactically preventing symptoms of such a deficiency, magnesium substitution therapy should be considered based primarily on an evaluation of predisposing factors [See Sept. article] and symptoms.(5)

Some of the common symptoms of magnesium deficiency include:(4,3)

- Chronic weakness, fatigue, and exhaustion
- Excessive noise and pain sensitivity
- High blood pressure
- Headaches
- Irritability, nervousness, anxiety
- Depression, apathy
- Muscle spasms, tics, tremors (especially of hands, feet or facial muscles), and motor
- Restlessness
- Difficulty with memory and concentration
- Insomnia
- Chronic constipation
- Chronic excessive muscle tension
- Confusion and disorientation
- Anorexia (poor appetite)
- Emotional ability (i.e. tendency to emotionally overreact)
- Ataxia (poor neuromuscular coordination)
- Irregular or rapid heart beat
- Learning disability

It is evident from this list that many classic magnesium deficiency symptoms are identical to common problems for which patients frequently visit their physicians. Strikingly, many of these symptoms are also identical to classic symptoms of ADD in both children and adults: irritability, motor (muscular) restlessness, difficulty with mental concentration and memory, confusion and disorientation, apathy, emotional ability, and learning disability!

Given this overlap of magnesium deficiency and ADD symptoms, and given the woefully inadequate magnesium status of the American diet and way of life, I suspect the vast majority of ADD sufferers are magnesium deficient. I also believe this deficiency is a major contributing cause, if not the primary cause, of most ADD cases. What, then, can be done?

It is unlikely that many 5 - 14 year olds will give up sugar, chocolate, soft drinks, loud music, hamburgers, hot dogs, cheese, pizza, milk shakes, ice cream, salty foods, etc.--all of which would be necessary to maximize dietary magnesium absorption and minimize magnesium urinary losses. It is equally unlikely that many ADD kids will become non-junk food vegetarians with a diet high in fresh, uncooked vegetables grown on soils heavily magnesium-fertilized. Thus, the simple

and effective way to remedy magnesium deficiency is through magnesium supplements.

Choosing Magnesium Supplements
There are many effective forms of magnesium. Magnesium ascorbate, succinate, malate, taurinate, glycinate, aspartate, citrate and chloride are all well-absorbed and well-utilized forms.(6) Magnesium oxide is less effective, requiring strong stomach acid for absorption. However, even magnesium oxide may be effective when taken with a high animal protein meal (which will elicit strong stomach acid release) and when taken at modest doses, e.g. 10 - 25 mg for children, 30 - 75 mg for adults.

Magnesium sulfate (Epsom salts) is poorly absorbed, is a strong laxative, and should not be used as an oral magnesium supplement.

How Much Magnesium is Enough?
Because healthy kidneys are extremely effective at excreting magnesium excesses, there is a fair margin in experimenting with dosage. However, those with known or suspected serious kidney disease, damage or malfunction should be very cautious in supplementing with magnesium. [Ed. note: Despite this standard caution, I have treated patients with chronic renal failure with 1,000 mg magnesium daily for extended periods (over a year) without signs of magnesium toxicity. WD] The US RDAs for magnesium are based on a 4 - 5 mg per kilogram of body weight dose (approx. 1.8 to 2.2 mg per pound) as being adequate for optimal magnesium status.

The real world American diet typically provides about 1.2 to 1.5 mg magnesium per pound of body weight. However, many magnesium experts such as Dr. Mildred Seelig believe an optimum magnesium intake--especially under stressful life conditions--is more in the range of 6 - 10 mg magnesium per kilogram of body weight (approximately 2.7 - 4.5 mg magnesium per pound of body weight). Since 60% of body magnesium stores are complexed to bone, and since children are increasing bone size and weight until age 20-plus, on a pound-for-pound body weight basis, children probably need more than adults. It is also interesting to note that Oriental diets typically provide 7 - 10 mg magnesium per kilogram of body weight, and Orientals generally have much lower heart disease rates than Americans--a significant sign of optimal magnesium intake.

Body Weight	Total Daily Magnesium
(pounds)	**Supplement Dose**
40	100 mg
50	125 mg
60	150 mg
80	200 mg
100	250 mg
120	300 mg
140	350 mg
160	400 mg
180	450 mg

Assuming that a typical American, low magnesium junk food diet supplies about 1.5 mg magnesium per pound of body weight, the above table provides some general guidelines for supplement amounts needed to bring combined diet and supplement levels to the Seelig and Oriental diet levels of intake. Ideally, magnesium intake should be divided into two or three doses, with meals. Those suffering from chronic insomnia might experiment with taking 50 - 200 mg magnesium before bedtime. The supplement levels listed are only general guidelines and are intended only for those with healthy kidneys and who are not regularly taking magnesium-containing laxatives or antacids. JS

References:

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