

Magnesium Deficiency and the Mind/Body Connection

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As health care professionals and the public become more informed about the importance of magnesium in maintaining one's health and vitality, the assessment of a person's magnesium status takes on even greater importance and urgency. For decades, it has been well established that magnesium deficiency is very closely related to cardiovascular and neurological problems (1, 2, 3). Magnesium deficiency has also been related to problems with glucose regulation, including hypoglycemia and diabetes. Cancer can now be added to the long list of health problems related to magnesium deficiency (4). As Mark Sircus Ac., OMD states:

“There is a power and a force in magnesium that cannot be equaled anywhere else in the world of medicine. There is no substitute for magnesium in human physiology; nothing comes even close to it in terms of its effect on overall cell physiology. Without sufficient magnesium, the body accumulates toxins and acid residues, degenerates rapidly, and ages prematurely. It goes against a gale wind of medical science to ignore magnesium chloride used transdermally in the treatment of any chronic or acute disorder, especially [cancer](#).” (4)

This topic involving magnesium status is of special interest to me, both personally and professionally, because I am highly susceptible to magnesium deficiency. Almost 30 years ago, I was fortunate that a friend and colleague of mine, Ken Candelaria, Ph.D., was well read and informed about the cardiovascular health risks associated with magnesium deficiency (1). Among the major health risks associated with magnesium deficiency are heart attacks, serious glucose regulation problems leading to diabetes, and cancer. I was already showing signs of all three of these health risks. Dr. Candelaria strongly recommended that I get a hair tissue mineral analysis (TMA). The results of this simple lab test clearly showed that I had a severe magnesium deficiency of 0.9 mg/% (the ideal hair TMA magnesium level is 6.0 mg/%).

Several challenges are presented by the vital issue of magnesium deficiency. One has to do with the valid assessment of a person's magnesium status in order to determine the presence and the extent of magnesium deficiency in a particular person. Even among the best magnesium researchers and clinicians, obtaining a valid measure of magnesium status has been a substantial challenge. Since obtaining a valid measure of a person's magnesium status has been such a challenging problem for medical doctors and researchers, Medline (5) has made the astonishing assertion that “magnesium deficiency is rare.” In contrast to the view expressed on Medline, in my personal and professional experience, I would assert that magnesium deficiency is and has been at epidemic proportions for decades. As I will explain below, most medical doctors and researchers simply don't obtain and look at magnesium laboratory data that would clearly show the prevalence of magnesium deficiency. What they are not looking at are hair TMA data.

The other challenge has to do with the impact of stress on magnesium status (1, 2) and, in particular, how the psychological aspect of stress depletes a person's magnesium. Since magnesium is a vital nutrient mineral that is involved in hundreds of important functions in the body, most concerns about magnesium deficiency tend to focus on the physical and nutritional aspects of magnesium deficiency. However, over the course of nearly 30 years of psychology and nutrition practice, I have learned that dealing with magnesium deficiency is far more complex than meets the eye. There is a "mind" or psychological factor that can have a profound effect on a person's magnesium status. This is because magnesium is closely related to the functions of the adrenal glands and the stress response – the "fight or flight" response.

Besides the well-known physiological aspects of the stress response, there is also a powerful psychological part of the stress response. This psychological part, of course, involves emotional reactions of the "fight or flight" response -- anger, rage, fear, anxiety, panic, and terror. But, there also is another profound psychological factor associated with stress and, ultimately, magnesium deficiency. As stress intensifies, not only do the basic "fight or flight" emotional reactions occur, but also stress tends to inflate a powerful psychological entity that I refer to as the "Judge" or "Inner Terrorist" (6).

When the psychological "Judge" becomes activated under stress, the "Judge" either maintains an intense stress reaction or it intensifies it. The "Judge" or "Inner Terrorist" is the dark "shadow" side of human nature that feeds on intense stress that is closely related to anxiety, fear, anger, and hate. The "Judge" or "Inner Terrorist" can be viewed as one of the shadow elements that Carl Jung described in his conception of human personality and archetypes. It is important to recognize that, despite all of our technological and cultural advances, there still remains within each one of us this dark destructive psychological part that is the "Judge." The "Judge" is inherent in human nature and is closely related to our survival mechanism – the stress response. This will be discussed in greater detail below.

Assessing Magnesium Deficiency

Dr. David Watts (7) strongly advocated making the distinction between an "absolute" magnesium deficiency and a "relative" magnesium deficiency. Dr. Watts also uses hair TMA to determine a person's "metabolic type" – fast or slow (8, 9). Metabolic type is closely related to measuring magnesium status. Using hair tissue mineral analysis (TMA) and an ideal magnesium level of 6 mg/%, it is easy to detect an absolute magnesium deficiency. If a person's hair TMA shows a magnesium level substantially below 6 mg/% as in the fast metabolic type individual, then clearly there is an absolute magnesium deficiency at a cell and tissue level.

Dr. Watts has made a major contribution to our understanding of magnesium deficiency with the concept of a "relative" magnesium deficiency. He defines a relative magnesium deficiency in relation to the TMA calcium level. This is reflected in the hair TMA Ca/Mg ratio. He has established the ideal hair TMA Ca/Mg ratio as 7/1. As this ratio increases above 7/1, a relative magnesium deficiency begins to manifest. In fact, as

mentioned above, my hair TMA in 1980 showed that I had both an “absolute” and a “relative” magnesium deficiency. My Ca/Mg ratio was 19/1. The ideal TMA Ca/Mg ratio is 7/1.

The relative magnesium deficiency can occur in the TMA of both the fast and the slow metabolic types. In many TMAs, it is possible to have both the absolute and the relative magnesium deficiency. This occurs most frequently in the fast metabolic type individual. Occasionally, both an absolute and a relative magnesium deficiency are observed in the hair TMA of a slow metabolic type person. It is relatively rare that both an absolute and a relative magnesium deficiency are found in a slow metabolic type individual. The relative magnesium deficiency is commonly found in slow metabolic type individuals, especially if there is a high sodium/potassium (Na/K) ratio also present.

Since an absolute magnesium deficiency is one of the defining characteristics of the hair TMA of a fast metabolic type individual, Dr. Watts’ concept of the relative magnesium deficiency is much more significant in understanding the magnesium status of the slow metabolic type individual. In the slow metabolic type hair TMA, it is commonly observed that both the calcium and magnesium levels are above the ideal level for each of these nutrient minerals. However, it is frequently found that a high ratio of Ca/Mg occurs in the hair TMA of slow metabolic types. The more that the Ca/Mg ratio exceeds the ideal Ca/Mg ratio of 7/1, the more likely symptoms of magnesium deficiency will manifest. Also, health risks associated with magnesium deficiency are likely to increase. Since slow metabolic type people almost always have a high level of magnesium in a hair TMA, Watts’ concept of a relative magnesium deficiency has both clinical and research implications for understanding individual cases and group health trends. As an illustration, relative magnesium deficiency in slow metabolic type women may be a significant factor in their increased risks for heart attacks that seem to baffle most clinicians and researchers.

One of the major functions of magnesium in cells is that it acts as a calcium channel blocker. In the presence of magnesium deficiency, this calcium channel blocking function is diminished. When a calcium channel blocking medication is prescribed for a person with an absolute and/or a relative magnesium deficiency, such a medication will obscure the serious magnesium deficiency that may be present. By not detecting and dealing with the magnesium deficiency, the prescribing physician leaves the person in a very vulnerable state. The calcium channel blocker simply does not perform the hundreds of functions of magnesium in the human body. In fact, calcium channel blockers do not even perform that function well. From my perspective, the prescribing of calcium channel blocking medications is a poor substitute for assessing the magnesium deficiency and taking steps to build up cellular magnesium reserves.

Stress and Psychological Factors in Magnesium Deficiency

As the psychological “Judge” intensifies the stress response, magnesium will very likely continue to be lost from cell and tissue reserves. As the magnesium loss continues, this allows the adrenal glands to intensify the stress response. The activation of the

adrenal glands will raise sodium levels that will very likely further reduce cellular magnesium reserves. As this process continues, the level of sodium (Na) will increase in relation to potassium (K) so that a high Na/K stress ratio results. The higher the Na/K ratio, the more intense the stress response will become. This results in further reducing magnesium levels in cells and tissues. This process involving magnesium reduction will further inflate the “Judge” psychologically, and this will maintain a high level of stress within the person. Some individuals will become so trapped in this serious vicious cycle involving stress that they will experience a health crisis, either physically and/or psychologically. An acute magnesium deficiency will be a significant part of this vicious cycle.

Psychologically, when the “Judge” is activated under stress, the body tension that is built up may prevent the retention of adequate magnesium from the diet and/or supplements. There may be a cellular loss of magnesium with intense stress. As stress intensifies, the person has a much greater need for magnesium.

When a person becomes aware of the “Judge” phenomenon and can “shrink” its size and psychological effect, a significant reduction in stress often occurs. As the intensity of stress is diminished, magnesium status often improves with greater retention of magnesium in the body. More magnesium tends to be absorbed and retained in cells and tissues. With the buildup of magnesium reserves, the “Judge” loses some of its psychological power over the person. This allows the person to manage stress much more effectively and with greater resilience. Health risks associated with the impact of stress and magnesium deficiency are greatly diminished.

In doing “Judge-work” (a form of art therapy) with many people, the visual channel and the positioning of their head when looking at a “Judge” drawing or clay sculpt have a great deal to do with the quality and the intensity of their stress response associated with the their “Judge”. Many people “lock on” to the “Judge” image with their eyes. This gives them a tunnel vision focus, blocking out most of the other stimuli that would normally be within their visual field. Some people even become mesmerized by intently looking at their “Judge” image. That is, they quickly enter an altered state of consciousness, often becoming detached from conscious awareness of their body and its reactions. Their stress reaction intensifies and they bypass their higher cognitive processes. They revert back to reacting on a basic survival reflex level of functioning. Also, over time, developmentally in childhood or adolescence, their “Judge” image or symbol (unique to each person) becomes imprinted on their brain tissue, usually via the visual channel and the optic nerve. When they are in a stressful situation, the “Judge” can inflate instantly by means of a reflex response. This instantaneous inflation of their “Judge” further intensifies their stress response and inflates the “Judge” in a vicious cycle. Anger, rage, anxiety, panic, terror, and/or depression are triggered, often resulting in further magnesium loss from cells.

Drugs, Medications, Hormones, and Magnesium Deficiency

Any prescription drug, over the counter (OTC) drug, or street drugs that induce a magnesium deficiency poses serious physical and mental health problems for the user. Stimulant drugs are notorious for the cardiovascular problems that often occur with the use of these types of drugs. Numerous deaths have occurred in children and adolescents who have been given a “diagnosis” of ADD or ADHD and a prescription for Ritalin, Adderall, or other stimulant drug. The most obvious explanation would be the fact that stimulant drugs consistently trigger a magnesium loss. Individuals who already have an absolute and/or a relative magnesium deficiency would be at much greater risk for a serious or even fatal cardiovascular event. The web site www.ritalindeath.com was started by the father of a 14 year-old boy who died suddenly following years of Ritalin use that was pushed by teachers at his school when the boy was in first or second grade. For years now, school personnel have been in the forefront of pushing dangerous use of powerful prescription stimulant drugs in order to “treat” ADD or ADHD. Teachers have been brainwashed in continuing education and training programs about ADD and ADHD, being led to believe that ADD and ADHD are real mental illnesses. School personnel are also led to believe that stimulant drugs are safe and pose no serious health risks for children or adolescents. School personnel are never told that stimulant drugs and magnesium deficiency have serious consequences for the health and well being of the child. In some cases, school personnel have actually involved the courts in forcing resistant parents to drug their child with these dangerous drugs that adversely affect the child’s magnesium status. Stimulant drugs put a person at very high risk for magnesium deficiency with all of the adverse health implications related to this vital mineral deficiency.

Diuretics (Thiazide drugs) for hypertension are known to deplete magnesium reserves. Calcium channel blockers also affect magnesium status, often masking the presence of a significant intracellular magnesium deficiency. Many drugs produce symptoms that can be related to magnesium deficiency, suggesting that these drugs may also deplete magnesium reserves. Unfortunately, the FDA does not require drug manufacturers to study the effects of their drugs on magnesium status. This state of affairs in drug oversight and regulation allows drugs to be put on the market that can have serious consequences for the patient if the drugs deplete magnesium reserves.

Estrogen in the form of birth control pills and hormone replacement therapy can be viewed as a major contributing factor to magnesium deficiency in teen girls and women. Hair TMA data show how estrogen affects copper, potassium, and calcium levels to produce the kind of nutrient mineral imbalances that are reflected in high Na/K and high Ca/Mg ratios. Estrogen tends to slow a woman’s metabolism as the hormone increases copper and calcium levels while lowering potassium levels. The high Na/K ratio reflects more intense stress, the “fight or flight” response, and inflating the “Judge” psychologically. As sodium levels increase, magnesium is lost from cells and tissues, resulting in a higher Ca/Mg ratio that reflects a relative magnesium deficiency. This state of nutritional mineral imbalance is exacerbated by the increase in the calcium level that is

the effect of estrogen and increases in copper. Estrogen thus plays a major role in inducing a relative magnesium deficiency in countless numbers of women and teen girls.

Summary and Conclusions

It is a well established scientific and clinical fact that magnesium is an extraordinarily important nutrient mineral for maintaining both physical and mental health. Cardiovascular functions, glucose regulation, stress regulation, cellular energy production, and neurological functions are among the most important functions involving magnesium. In maintaining the healthy functioning of cells, magnesium also plays a role in reducing the risk of cancer. Therefore, it is critically important to (1) accurately assess a person's magnesium status and whether a magnesium deficiency is present and to (2) assess a person's stress condition and whether the person is adversely affected by powerful psychological factors that decrease cellular magnesium reserves. The hair tissue mineral analysis (TMA) is extremely accurate and is the best laboratory tool available at reasonable cost for assessing both an absolute and a relative magnesium deficiency.

The concept of the "Judge" is a powerful psychological entity that is closely related to the stress response, regulation of the adrenal glands, and magnesium deficiency. Awareness of the "Judge" and dealing with it (shrinking its image) greatly reduces the intensity of stress associated with this powerful psychological entity that has a profound effect on a person's magnesium status.

Since magnesium deficiency has profound adverse effects on the health of vast numbers of people, I strongly believe that magnesium deficiency should be a major issue in public health policy and health care reform.

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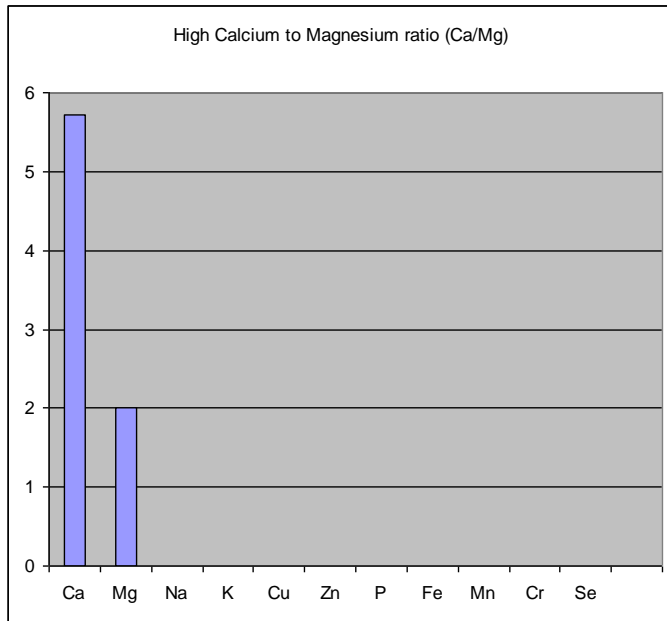
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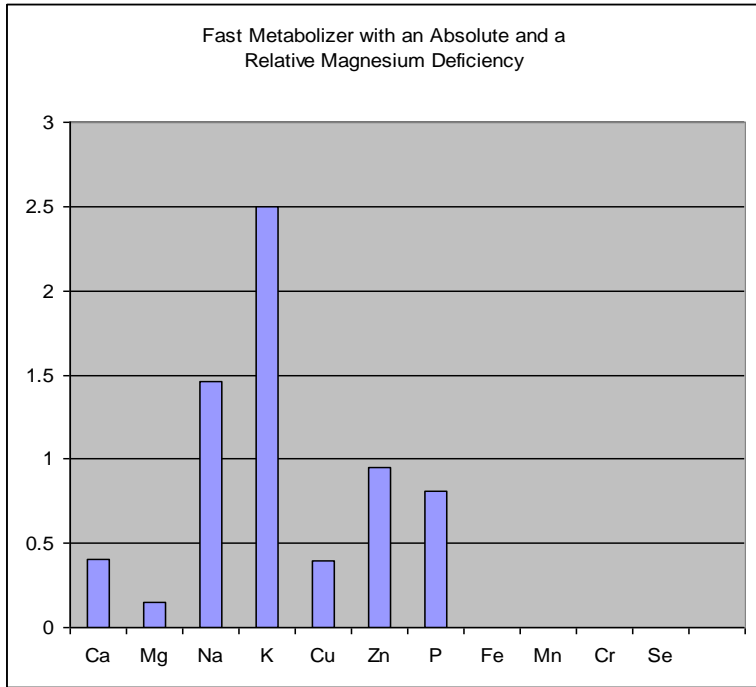
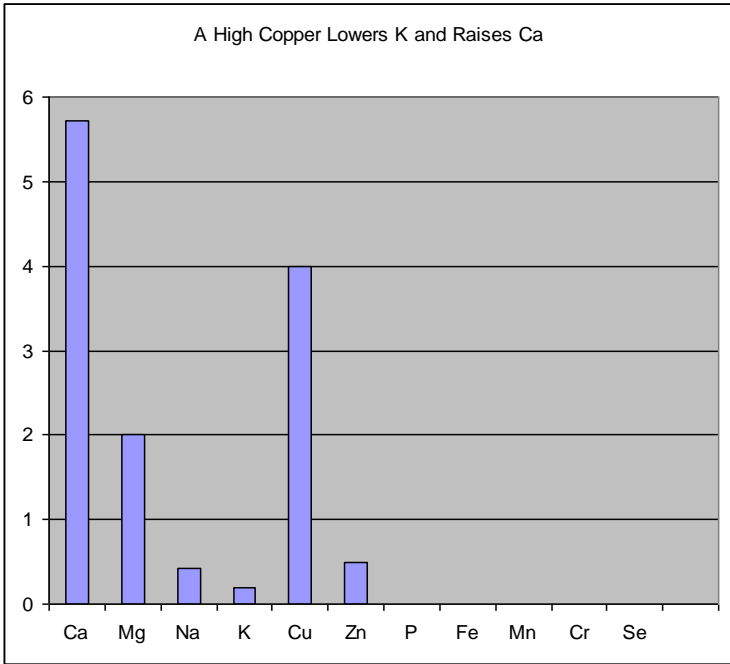
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Many of these references may be accessed on the internet with a Google search.

Appendix A

Graphic illustrations of absolute and relative magnesium deficiency as observed in hair TMA laboratory results:





Magnesium is a key mineral cofactor for many anaerobic as well as aerobic reactions that generate energy, and has an oxygen-sparing effect. It is essential for the cell's mitochondria "powerhouses" to function normally, being involved in both the production and utilization of ATP.

Appendix B

The “Judge” Looms Over the “Inner Child” Increasing Stress and Magnesium Loss
(From *Shrinking the Judge: Freeing the Inner Child*)

