

VITAMINS AND MINERALS IMPACT ON DIABETES

What you do not know might kill you!

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LIFE EXPECTANCY

□ Adam	930 Years
□ Methuselah	969 Years
□ Noah	950 Years
□ Eber	464 Years
□ Isaac	180 Years
□ Jacob	147 Years
□ Average American	76 Years
□ American Doctors	58 Years

HIGH CARBOHYDRATE/LOW FAT DIET

- ❑ Chronic fatigue is the number one complaint of Americans.
- ❑ 50% of adults and 30% of children in this country are overweight.
- ❑ Diabetes has reached epidemic proportions and have increased 10-fold over the past 40 years.
- ❑ Cancer affects at least 40% of Americans.
- ❑ Heart attacks and strokes will kill more than 42% of Americans.

U.S. CANCER DEATHS

□ 1900	3%
□ 1950	20%
□ 2000	40%
□ 2020	50%
□ 2100	100% (predicted)

WHAT HAVE WE DONE?

- ❑ **High Carbohydrate /low fat diet**
- ❑ **High consumption of altered and saturated fats**
- ❑ **Food processing**
- ❑ **Food additives**
- ❑ **Depletion in soil of trace minerals**
- ❑ **Genetically modified food**
- ❑ **Inactivity**
- ❑ **Stress**

WOULD YOU BELIEVE ?

- Do you know that most of us today are suffering from certain dangerous diet deficiencies which cannot be remedied until depleted soils from which our food come are brought into proper mineral balance? The alarming fact is that foods (fruits, vegetables and grains) now being raised on millions of acres of land that no longer contain enough of certain minerals are starving us – no matter how much of them we eat. The truth is that our foods vary enormously in value, and some of them aren't worth eating as food. Our physical wellbeing is more directly dependent upon the minerals we take into our systems than upon calories or vitamins or upon the precise proportions of starch, protein, or carbohydrates we consume. Laboratory tests prove that the fruits, the vegetables, the grains, the eggs, and even the milk and the meats of today are not what they were a few generations ago. No man today can eat enough fruits and vegetables to supply his

WOULD YOU BELIEVE? (CONT.)

- stomach with the mineral salts he requires for perfect health, because his stomach isn't big enough to hold them! And we are turning into a nation of big stomachs.
- From the 74th Congress, 2nd Session, Senate document no. 264, 1936

WHAT ARE WE GETTING

- ❑ **Chronic fatigue**
- ❑ **Obesity**
- ❑ **Diabetes**
- ❑ **Hyperlipidemia**
- ❑ **CVD (heart disease, stroke and hypertension)**
- ❑ **Blindness (Neuropathy)**
- ❑ **Kidney damage (Nephropathy)**
- ❑ **Nerve Damage (Neuropathy)**
- ❑ **Depression**
- ❑ **Cancer**

MINERAL DEFICIENCIES

□ **Iron**

Anemia

□ **Iodine**

Goiter

□ **Copper**

Aneurysms

□ **Calcium**

Tetany



WHAT I HAVE LEARNED
FROM MY PATIENTS

TREOLIFE VITAMINS

- **The B Group Vitamins**

 - Thiamine (vitamin B1)**

 - Riboflavin (vitamin B2)**

 - Niacin (vitamin B3)**

 - Pantothenic Acid (B5)**

 - Pyridoxine (vitamin B6)**

 - Biotin (vitamin B7)**

 - Folic Acid (vitamin B9)**

 - Cobalamine (vitamin B12)**

- **Vitamin D**

- **Vitamin C**

- **Alpha lipoic acid**

TREOLIFE MINERALS

- ❑ **Chromium (as chromium polynicotinate)**
- ❑ **Vanadium (as vanadium sulfate)**
- ❑ **Selenium**
- ❑ **Zinc (as zinc gluconate)**
- ❑ **Magnesium (as magnesium glycinate)**
- ❑ **Manganese (as manganese sulfate)**
- ❑ **Iodine**
- ❑ **Copper (as copper gluconate)**
- ❑ **Boron**

TREOLIFE EFA OILS

- **Flax seed oil**
- **Hemp seed oil**
- **Evening primrose oil**
- **Pumpkin seed oil**
- **Sunflower seed oil**

TREOLIFE VITAMINS

- **Vitamin E**
- **Co-enzyme Q-10**

THE TREOLIFE SYSTEM



Treolife VM

Treolife EFA

U.S. Patent 7,332,181 and 7,875,211

THE B GROUP VITAMINS

- **Critical for normal cellular and nerve function**
- **Replication**
- **Repair**
- **Metabolism**
- **Energy production**
- **Proper Enzymatic function:**
 - Pyruvate decarboxylase**
 - Propionyl – coA carboxylase**
 - Acetyl – coA carboxylase**
 - Branched chain alpha-keto acid dehydrogenase**
 - Transketolase**

VITAMIN B SUPPLEMENT IS A MUST IN DIABETICS

- ❑ **Increased urination due to osmotic effects of high blood glucose**
- ❑ **Decreased efficiency due to cooking and food processing**
- ❑ **Increased need with high carbohydrate diet**

Low vitamin D levels linked to poor blood sugar control in type 2 diabetes

1 message

Bruce Stewart <bstewart75@gmail.com>
To: ahabibmdpec@gmail.com

Thu, Jul 1, 2010 at 12:05 PM

Low vitamin D levels linked to poor blood sugar control in type 2 diabetes

by S. L. Baker, features writer

(NaturalNews) According to the National Institutes of Health (NIH), almost 11 percent of Americans age 20 or older have diabetes. And the most common form of this disease, type 2 diabetes, has reached epidemic proportions. Now scientists have found a link between vitamin D deficiency and the inability of many patients with this kind of diabetes to keep their blood sugar under control. ***What's more, this raises the strong possibility that, along with being overweight and sedentary, a lack of vitamin D could be a major factor in triggering type 2 diabetes in the first place.***

Esther Krug, MD, an assistant professor of medicine at the Johns Hopkins University School of

Vitamin D Improves Insulin Sensitivity, Helps Prevent Diabetes

1 message

Bruce Stewart <bstewart75@gmail.com>
To: ahabibmdpec@gmail.com
Cc: Keith Sledge <keith@psipharmacy.com>

Fri, Mar 12, 2010 at 6:08 PM

Vitamin D Improves Insulin Sensitivity, Helps Prevent Diabetes

by David Gutierrez, staff writer

(NaturalNews) High-dose vitamin D supplements may help increase the body's sensitivity to the blood sugar-regulating hormone insulin, thus reducing the risk of diabetes, researchers have found.

Insulin resistance (or insensitivity) occurs when the body's tissues stop responding as strongly to the presence of insulin. As a consequence, the cells uptake less sugar from the bloodstream, producing the elevated glucose levels characteristic of diabetes.

In the current study, conducted by researchers from Massey University and published in the

Higher Vitamin D Levels Linked to Lower Diabetes Risk

Emma Hitt, PhD

June 25, 2011 (San Diego, California) — Higher levels of vitamin D in the blood appear to be associated with a reduced risk for incident diabetes among people at high risk for the disease, according to a new report.

Anastassios G. Pittas, MD, from the division of endocrinology, diabetes, and metabolism at the Tufts New England Medical Center in Boston, Massachusetts, and colleagues presented the findings here at the American Diabetes Association 71st Scientific Sessions.

According to Dr. Pittas, vitamin D might play a role in diabetes by improving insulin secretion and insulin sensitivity. "Most of the evidence focuses on a favorable effect in pancreatic beta cells," he told *Medscape Medical News*.

To determine the relation between vitamin D status and risk for incident diabetes, the researchers analyzed data from the Diabetes Prevention Program (DPP), a 3-group trial comparing intensive lifestyle modification or metformin with placebo for the prevention of diabetes in patients with prediabetes.

New research finds possible reason for obesity and type 2 diabetes epidemics in kids: lack of vitamin D

1 message

Bruce Stewart <bstewart75@gmail.com>

Tue, Dec 6, 2011 at 7:55 AM

To: ahabibmdpec@gmail.com, Keith Sledge <keithsledge@hotmail.com>

NaturalNews) If there's one nutrient that has received an amazing amount of attention and research over the past year, it's vitamin D. As NaturalNews has reported extensively, a lack of the vitamin has been linked to everything from dementia and arthritis to heart disease and breast cancer.

What's more, as scientists have probed deeper into the question of vitamin D deficiency, they've come up with an alarming finding – huge numbers of people tested appear to be deficient in the vitamin. For example, researchers at Johns Hopkins Bloomberg School of Public Health released a study showing American youth are facing potentially severe health consequences from a lack of vitamin D, which is also known as the "sunshine vitamin." (http://www.naturalnews.com/025834_V...)

Other top health news stories about children have related the startling findings that both obesity and type 2 diabetes have reached epidemic proportions in the US. Now research set for publication in The Endocrine Society's January 2012 issue of the *Journal of Clinical Endocrinology & Metabolism (JCEM)* reveals ***all these problems appear to be related to the widespread vitamin D deficiency in the population.***

Vitamin D: importance in the prevention of cancers, type 1 diabetes, heart disease, and osteoporosis¹⁻⁵

Michael F Holick

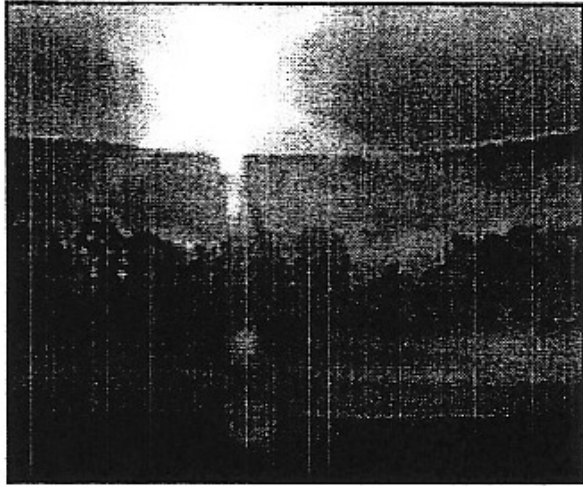
ABSTRACT

The purpose of this review is to put into perspective the many health benefits of vitamin D and the role of vitamin D deficiency in increasing the risk of many common and serious diseases, including some common cancers, type 1 diabetes, cardiovascular disease, and osteoporosis. Numerous epidemiologic studies suggest that exposure to sunlight, which enhances the production of vitamin D₃ in the skin, is important in preventing many chronic diseases. Because very few foods naturally contain vitamin D, sunlight supplies most of our vitamin D requirement. 25-Hydroxyvitamin D [25(OH)D] is the metabolite that should be measured in the blood to determine vitamin D status. Vitamin D deficiency is prevalent in infants who are solely breastfed and who do not receive vitamin D supplementation and in adults of all ages who have increased skin pigmentation or who always wear sun protection or limit their outdoor activities. Vitamin D deficiency is often misdiagnosed as fibromyalgia. A new dietary source of vitamin D is orange juice fortified with vitamin D. Studies in both human and animal models add strength to the hypothesis that the unrecognized epidemic of vitamin D deficiency worldwide is a contributing factor of many chronic debilitating diseases. Greater awareness of the insidious consequences of vitamin D

deficiency, calcium became an important component for organisms that developed exoskeletons. The use of calcium for structural scaffolding became critically important in the evolution of ocean-dwelling vertebrates. The plentiful calcium in the oceans provided the ideal element to incorporate into a collagen-based matrix that gave rise to the structurally rigid vertebrate skeleton. The development of the vertebrate endoskeleton not only provided an opportunity for organisms to grow in size but also gave organisms the opportunity to venture onto land. As vertebrate organisms left their ocean environment for a land-based existence, they needed to develop an efficient method of utilizing the calcium that was absorbed into plants from the calcium-rich soil environment. Remarkably, it was the sun's energy that was called on to promote the photosynthesis of vitamin D₃ in the skin of vertebrates that was responsible for enhancing the efficiency of intestinal-calcium absorption (1).

Little is known about when vitamin D made its appearance on Earth and what its function was. However, it is known that some of the earliest phytoplankton and diatom life forms, including *Emiliania huxleyi*, which has existed in the oceans for > 750 mil-

Study Says More Vitamin D Reduces Cancer Risk



Sunlight is a major source of vitamin D.

LA JOLLA - Only about 10 percent of Americans take in enough vitamin D each day to ward off breast cancer and other diseases, according to a study released Tuesday by UC San Diego's School of Medicine and Creighton University in Omaha, Neb.

Scientists say higher vitamin D intake will slash cancer, MS, and diabetes risk by half

1 message

Bruce Stewart <bstewart75@gmail.com>
To: ahabibmdpec@gmail.com

Wed, Mar 2, 2011 at 6:41 AM

Scientists say higher vitamin D intake will slash cancer, MS, and diabetes risk by half

by S. L. Baker, features writer

(NaturalNews) In findings just published in the journal *Anticancer Research*, scientists at the University of California (UC) San Diego School of Medicine and Creighton University School of Medicine in Omaha have reported that most people need a much higher intake of vitamin D. ***And that simple step added to your life could slash your risk of developing serious diseases -- including cancer -- by about 50 percent.***

The new study involved a survey of several thousand volunteers who took supplements containing 1000 to 10,000 IU per day. The researchers ran blood tests to measure the level of 25-vitamin D, which is the form of almost all vitamin D circulating in the bloodstream.

Low Vitamin D Predicts Coronary Calcification

BY BRUCE JANCIN

FROM A CONFERENCE ON PRACTICAL WAYS TO ACHIEVE TARGETS IN DIABETES CARE

KEYSTONE, COLO. – Vitamin D deficiency strongly predicted rapid progression of coronary artery calcification in adults with type 1 diabetes in a large, prospective study.

The association between low vitamin D and progression of coronary artery calcification was independent of the standard coronary artery disease risk factors. This suggests vitamin D may be related to early coronary atherosclerosis through a novel pathway, Dr. Marian Rewers observed at the conference, sponsored by the University of Colorado and the Children's Diabetes Foundation at Denver.



The findings came from the prospective CACTI (Coronary Artery Calcification in Type 1 Diabetes) study. This portion of CACTI included 374 type 1 diabetes patients with a mean age of 40 years. More than half were women. Coronary artery calcification (CAC) was measured by electron-beam CT at baseline and 3- and 6-year follow-up. Serum 25-hydroxyvitamin D was measured at the 3-year mark.

One-quarter of the subjects had insufficient vitamin

D – a serum level of 20-30 ng/mL. Another 10% were vitamin D deficient. Deficiency was associated with a 3.3-fold increased likelihood of CAC at 3 years after adjustment for age, gender, and hours of exposure to daylight. Patients with vitamin D insufficiency had an adjusted significant 1.8-fold increased risk, said Dr. Rewers, principal investigator for CACTI.

Among subjects who were free of CAC at the 3 years, vitamin D deficiency predicted development of CAC between years 3 and 6 of follow-up. A novel finding in CACTI was that vitamin D deficiency at 3 years was a significant predictor of developing CAC during the next 3 years only in the subgroup with the vitamin D receptor M1T CC genotype. Vitamin D deficiency in patients with the CC genotype was associated with a 6.5-fold increased likelihood of CAC, compared with that of subjects with a normal vitamin D level.

DR. REWERS

In contrast, vitamin D deficient patients with the CT or TT genotypes weren't at significantly increased risk, noted Dr. Rewers, professor of pediatrics and preventive medicine, and clinical director of the Barbara Davis Center for Childhood Diabetes at the university.

CAC is a well-established marker of arterial plaque burden and a strong predictor of future coronary

Major Finding: Vitamin D deficiency was associated with a 3.3-fold increased likelihood of CAC being present at 3 years after adjusting statistically for age, gender, and hours of exposure to daylight.

Data Source: 374 type 1 diabetes patients with a mean age of 40 years in the CACTI study.

Disclosures: The CACTI study was funded by the National Institutes of Health. Dr. Rewers declared having no relevant financial interests.

events. The CACTI findings suggest vitamin D may be involved in the early stages of CAC.

Audience members asked Dr. Rewers and other speakers how much vitamin D they're taking.

"Every time I come home from a medical meeting I take more vitamin D," quipped Dr. David M. Kendall, chief scientific and medical officer for the American Diabetes Association and a diabetologist at the University of Minnesota, Minneapolis. He was referring to evidence suggesting benefits ranging from cardioprotection to anticancer and antidementia effects and beyond.

Like Dr. Kendall, Dr. Matthew C. Riddle now takes 2,000 mg of vitamin D daily.

"We don't know the answer as to the 'right' amount. But the risk vs. benefit is appealing. There are some real potential benefits," said Dr. Riddle, professor of medicine at Oregon Health & Science University, Portland. ■

More Evidence Links Low Vitamin D to Depression

Megan Brooks

February 13, 2012 — A large cross-sectional study of adults suggests a link between low vitamin D levels and depressive symptoms, particularly in individuals with a history of depression.

Because the relationship between low vitamin D levels and depression was stronger in those with a prior history of depression, "it may be more of a marker for relapse than for new-onset," senior investigator E. Sherwood Brown, MD, PhD, head of the psychoneuroendocrine research program at the University of Texas Southwestern Medical Center, Dallas, told *Medscape Medical News*.



WHY WE HAVE VITAMIN D DEFICIENCY

- 1. Insufficient intake**
- 2. Lack of sun exposure**
- 3. Use of sun blocks**
- 4. Smog & pollution**
- 5. Dark skin**
- 6. Low fat diet**
- 7. Mal-absorption**

(Cystic Fibrosis, Crohn's disease, Ulcerative colitis, Celiac Disease, Gallbladder disease, short gut syndrome, high soy diet)

VITAMIN D DEFICIENCY

A. Short term – Fatigue

Muscle ache (Fibromyalgia)

Depression

B. Long term – Increased risk for Diabetes – Type I and Type II

Increased risk for Cancer

Increased risk for Osteoporosis

Increased risk for Cardiovascular disease

VITAMIN D DEFICIENCY AND DIABETES

- **Insulin Resistance (Type II)**
- **Insulin Deficiency (Apoptosis) (Type I)**

INSULIN RESISTANCE



Inflammatory state associated with elevated cytokine levels, which through oxidative stress cause endothelial dysfunction

VITAMIN D SUPPLEMENT

- **Decreased markers of inflammation (HSCRP)**
- **Improved endothelial function in patients with Type II Diabetes**




**COULD VITAMIN D SUPPLEMENT
DECREASE THE EPIDEMIC OF
TYPE II DIABETES**

VITAMIN D SUPPLEMENT


- **Prevent Type II Diabetes by decreasing insulin resistance.**
- **Prevent cardiac events by improving endothelial function.**



**OBESITY IS ASSOCIATED WITH
LOW VITAMIN D LEVELS**



**WOULD VITAMIN D SUPPLEMENT
IN OBESE PATIENTS
PREVENT THE DEVELOPMENT
OF TYPE II DIABETES**



**EVERY OBESE PATIENT OR PATIENTS
WITH A HIGH RISK FACTOR TO
DEVELOP DIABETES SHOULD HAVE
HIS/HER 25 HYDROXY VITAMIN D
LEVELS CHECKED**

VITAMIN D DEFICIENCY AND DIABETES

- **Insulin resistance (Type II)**
- **Insulin deficiency (Apoptosis) (Type I)**

APOPTOSIS

- **Glucotoxicity**
- **Lipotoxicity**
- **Inflammation**


VITAMIN D

- **Preserve pancreatic beta cells. (Vitamin D Receptors are present in the nucleus of beta cells)**
- **Improve insulin release. (Vitamin D Deficiency decreases insulin release)**
- **ANTI-FLAMMATORY EFFECT**

(10,336 Finnish Children's Study)



**COULD VITAMIN D SUPPLEMENT
DECREASE THE EPIDEMIC
OF TYPE I DIABETES**

- 
- **Optimal** **80 – 100 NG/ML**
 - **Insufficiency** **Below 30 NG/ML**
 - **Deficiency** **Below 20 NG/ML**

ALPHA LIPOIC ACID

- **Vitamin – like antioxidant**
- **Convert carbohydrates to energy**
- **Important component of the Metabolic Systems**

ALPHA LIPOIC ACID, GLUCOSE METABOLISM AND DIABETES

- ❑ **Improve Diabetic Neuropathy (reduction of proteins Glycosylation)**
- ❑ **Increase intracellular Glutathion and Co-Enzyme Q-10**
- ❑ **Enhance the antioxidant power of Vitamin C and E**
- ❑ **Improve insulin sensitivity and oral glucose tolerance in Diabetes Mellitus Type II**
- ❑ **Improve cardiac autonomic Neuropathy**
- ❑ **Protect against the damaging effects of oxidative stress**

PHASES OF MINERAL DEFICIENCY

- **Initial depletion phase**
- **Compensated metabolic phase**
- **Decompensated metabolic phase**
- **Clinical phase**

CHROMIUM, THE GLUCOSE TOLERANCE FACTOR

- **90% of Americans are deficient in chromium (Richard Anderson, USDA)**
- **The average intake of 50-100 mcg of inorganic chromium from food and water supplies only 0.25 to 0.5 mcg of usable chromium, but contrast 25% of chelated chromium is absorbed**
- **The chromium RDA for humans is between 50 to 200 mcg per day for adults**
- **The concentration of chromium is higher in newborn animals and humans than it is in later life**
- **Chromium levels of unsupplemented human tissue steadily decreases through life and there has been a steady decline in the average American's serum chromium since 1948**

CHROMIUM

- **Plasma level of chromium in humans over the past 20 years have ranged from 0.075 to 13 ng/ml**
- **Concentration of chromium in a human hair is 10 times greater than in blood making hair analysis a much more accurate view of chromium stores and function in humans**
- **Very little inorganic chromium is stored in the body (1.5 mg) once inorganic chromium is absorbed it is almost entirely excreted in the urine and therefore urine chromium levels can be used to estimate dietary chromium status**
- **Dietary sugar loads (sodas, juices, honey, candy, fructose, etc.) increase urinary chromium loss by 300% for 12 hours**

CHROMIUM

- **Activates phospho-glucosonetase and other enzymes**
- **Associated with glucose tolerance factor (GTF), a combination of chromium III, dinicotinic acid and glutathione**
- **Fasting plasma chromium level of pregnant women is lower than that of non-pregnant women**
- **Impairment of glucose tolerance in “normal pregnancy” reflects chromium deficiency resulting in gestational Diabetes**
- **Chromium deficiency is a major cause of development of Diabetes Mellitus Type II**
- **Increased life span in laboratory animals by 33% when they were supplemented with chromium. Caloric restriction was the only way to extend life past the expected average**
- **Chromium deficiencies are aggravated by vanadium deficiency**
- **Picolinate vs. polynioctinate**

VANADIUM, THE MIMIC

- **Metallic vanadium (vanadyl sulfate) is absorbed from the intestinal tract poorly at 0.1-1%. Vanadium chelates at 40% and plant-derived colloids at 98%**
- **Essential trace mineral, stimulates glucose oxidation and transport in fat cells, glycogen synthesis in liver and muscle, inhibits liver gluconeogenesis (production of glucose from fat) and absorption of glucose from the gut**
- **Enhances the stimulating effect of insulin on DNA synthesis, despite low serum insulin**
- **Functions like insulin by altering cell membrane function for ion tolerance problems (hypoglycemia, hyperinsulinemia, and diabetes) by making the cell membrane insulin receptors more sensitive to insulin**
- **Some people feel that vanadium supplementation can have a major positive economic impact by reducing or even eliminating most cases of adult onset diabetes**

VANADIUM

- ❑ **Inhibits cholesterol synthesis in animals and humans.**
- ❑ **Initiate and increase the contractibility of heart muscle.**
- ❑ **Has anti-carcinogenic properties.**

CLINICAL DISEASES ASSOCIATED WITH VANADIUM DEFICIENCY

- ❑ **Slow growth**
- ❑ **Increased infant mortality**
- ❑ **Infertility**
- ❑ **Elevated cholesterol**
- ❑ **Elevated triglycerides**
- ❑ **Hypoglycemia**
- ❑ **Hyperinsulinemia**
- ❑ **Diabetes**
- ❑ **Cardiovascular disease**

ZINC

- ❑ **Zinc deficiency is a worldwide problem, even among well-nourished populations**
- ❑ **Cofactor in more than 200 enzymatic reactions, (immune function, protein synthesis, cell growth, hormone synthesis)**
- ❑ **Excesses of copper and iron and high phytate diet reduce availability of dietary zinc**
- ❑ **Heavy losses of zinc occur in sweat and un-supplemented athletes are particularly at risk for severe zinc deficiency**

SYMPTOMS OF ZINC DEFICIENCY

- ❑ **Fatigue**
- ❑ **Cardiomyopathy**
- ❑ **Poor appetite**
- ❑ **Digestive problems**
- ❑ **Weak immune system**
- ❑ **Sexual dysfunction**
- ❑ **Prostate enlargement**
- ❑ **Sterility**
- ❑ **Vision and hearing impairment**
- ❑ **Smell and taste dysfunction**
- ❑ **Depression**

THE ZINC TASTE TEST

Based on the detection of gustin, a polypeptide in the mouth that distinguishes metal, the patient is asked not to eat, drink or smoke for 30 minutes before the test. A 0.1% zinc sulfate heptahydrate solution (about 10 ml) is swished in the mouth for 10 seconds. It is then swallowed or expectorated. After 30 seconds, the patient is asked to describe the taste. Responses are classified as follows...

THE ZINC TASTE TEST

- ❑ **No taste or the taste of water is noted. (severe deficiency)**
- ❑ **No taste noted initially, but a taste often described as dry, “mineral”, like “bicarbonate”, or sweet develops in 10 or 15 seconds (moderate deficiency)**
- ❑ **A definite but not strongly unpleasant taste is noted immediately and tends to intensify in time. (mild deficiency)**
- ❑ **An immediate unpleasant, obviously aversive taste that often causes the patient to grimace is noted. (no deficiency)**

TREATMENT

- ❑ **Liquid preparation of zinc sulfate heptahydrate to replenish the metallothionein-1 transport system**
- ❑ **Elderly 30-60 mg.**
- ❑ **Burns, trauma 150 mg**
- ❑ **Effect on copper level can cause anemia**
- ❑ **Zinc / copper ratio is 10:1**
- ❑ **Selenium can be depleted by large doses of zinc**
- ❑ **Coffee, phytates, calcium, phosphorus and iron may interfere with zinc absorption**
- ❑ **Alcohol increases the excretion of zinc in the urine**

MAGNESIUM

THE BEAUTIFUL METAL

- Basic building block of life
- Important factor for enzymes involved in carbohydrate metabolism

THE TWIN

MAGNESIUM AND INSULIN

- Magnesium and Insulin are like a twin who need each other
- Without Insulin Magnesium does not get transported from the blood to the cells
- Plasma and Intracellular magnesium concentration are tightly regulated by Insulin via activation of $\text{Na}^+/\text{Mg}^{+2}$ exchange

Insulin Transport and Storage

- Without Magnesium, Beta cells will not secrete enough Insulin or the Insulin it secretes is not effective

Insulin Resistance

LOW MAGNESIUM

- Decreased Insulin transport and storage
- Decreased Insulin secretion
- Insulin resistance
- Impaired Glucose Tolerance (IGT)

IMPAIRED GLUCOSE TOLERANCE (IGT)

- Magnesium modulates insulin action and effects insulin signaling at the receptors site
- Adipocyte cells placed in low magnesium media show reduction in Insulin stimulated glucose uptake
- Low erythrocyte magnesium content increase membrane micro viscosity which impairs insulin interaction with its receptors
- Magnesium deficiency leads to increased intracellular calcium levels which lead to Insulin Resistance
- Tyrosinekinase activity is decreased in muscle Insulin receptors of rats fed a low magnesium diet

DIABETES

A MAGNESIUM WASTING DISEASE

- Lack of Insulin (Type I) or Insulin Resistance (Type II) cause large amounts of magnesium to be excreted through the urine. “The Magnesium Wasting Disease”
- Insulin Resistance and magnesium depletion result in a vicious circle of worsening Insulin resistance and decreasing Intracellular magnesium

MORE ABOUT MAGNESIUM

- A. Lower dietary magnesium and lower serum magnesium are associated with increased risk for Type II Diabetes
- B. Low Magnesium levels worsen Type II Diabetes causing low insulin levels and elevated blood sugar
- C. Diabetes Mellitus is associated with magnesium depletion, which in turn contributes to metabolic complications of Diabetes including vascular disease and Osteoporosis
- D. Oral magnesium supplements help individual who have become insulin resistance avoid developing Type II Diabetes

- Daily oral magnesium supplementation improves insulin sensitivity by 10% and reduced blood sugar by 37%

Guerrero-Romero F, Tamaz-Perez HE, Gonzalez-Gonzalez G et al. Oral magnesium supplementation improves insulin sensitivity in nondiabetic subjects with insulin resistance. A double-blind placebo-controlled randomized trial. *Diabetes Metab.* 2004 Jun; 30(3):253-8

Rodriguez-Moran M and Guerrero-Romero F. Oral magnesium supplementation improves insulin sensitivity and metabolic control in Type 2 diabetic subjects: a randomized double-blind controlled trial. *Diabetes Care* 2003 Apr;26(4);1147-52

THE DIABETES-HEART DISEASE CONNECTION

Magnesium helps the muscles to relax losing magnesium makes the blood vessels constrict leading to Hypertension

Magnesium helps correct abnormal lipoprotein patterns

lowers Triglycerides

lowers LDL

increases HDL

MAGNESIUM

- **Essential to all living organisms and has electrochemical, catalytic and structural functions**
- **Activates numerous enzymes and is a constituent of all chlorophylls**
- **Required for the production and transfer of energy for protein synthesis, for contractility of muscle and excitability of nerves**
- **Also a co-factor in numerous enzymes systems**
- **Excess magnesium will inhibit bone calcification, calcium and magnesium have antagonistic roles in normal muscle contraction, calcium acting as a stimulator and magnesium as a relaxor. Excessive amounts of calcium can induce magnesium deficiency**
- **Hypocalcemia can't be corrected until Hypomagnesimia is corrected.**

MAGNESIUM

- **Adult humans contain 20 to 28 grams of total body magnesium. 60% in the bone. 26% in the skeletal muscles and the balance is distributed between various organs and body fluids.**
- **Serum magnesium ranges from 1.5 to 2.1 mEq/L and is second to potassium as intracellular cation.**
- **The rate of absorption of magnesium ranges from 24 to 85%. The lesser absorption rate is for metallic source of magnesium, the higher levels are associated with plant-derived chloral sources.**
- **Vitamin D has no effect on magnesium absorption.**
- **The presence of fat, phytates and calcium reduces the efficiency of absorption.**
- **High performance athletes lose a considerable amount of magnesium in sweat.**
- **RDA of magnesium is 350 mg per day for adult male, 300 mg per day for adult female, and 450 per day for pregnant and lactating females. If kidneys are healthy, there is no evidence of toxicity up to 6000 mg per day.**

STUDY RESULTS

- **PATIENT RECEIVING THE VM FORMULA =**
55% had an average decrease of HgbA1c by 1%

- **PATIENT RECEIVING THE PLACEBO =**
90% had an average increase of HgbA1c by 1.3%

THE TREOLIFE SYSTEM

Treolife VM

Treolife EFA

U.S. Patent 7,332,181 and 7,975,211

FOR INFORMATION

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