TRACE ELEMENTS

NEWS UPDATES - FOR THE HEALTHCARE PROFESSIONAL

January - March 2010

Use of Hair Mineral Analysis for Detecting Trace Element Deficiency in Chronic Gastrointestinal Disease

This paper explored the use of hair tissue mineral analysis (HTMA) studies conducted at TEI on the trace element status of children with chronic gastrointestinal (G.I.) disease. Gastrointestinal disease contributes to the risk of mineral deficiencies due to impaired absorption and G.I. losses. Blood and HTMA studies were performed to evaluate mineral status of patients with G.I. disease. The results revealed that almost all patients had mineral deficiency. Trace elements found deficient in the blood or hair included zinc, selenium and copper. Hair zinc levels were found to be significantly lower in groups receiving parenteral nutritional support and hair selenium levels were significantly associated with clinical symptoms of selenium deficiency. Results suggested that patients with G.I. disease should receive adequate zinc and selenium replacement treated with long-term parenteral nutrition and that hair mineral analysis is a useful and complementary tool for the determination of trace elements status. *Trace Elements Deficiency and the Diagnostic Usefulness of Hair Mineral Analysis in Children with Chronic Gastrointestinal Disease. Hong, J, et al. Korean J. Ped. Gastroenterol. Nutr. 11, 2008.*

Hair Mineral Status and Variations in Body Mass Index

Investigations of hair calcium, magnesium, sodium, potassium, iron, copper and zinc were conducted on four groups of adult females totaling three hundred ninety two individuals ranging in age from twenty to fifty years with different body mass index. The women were grouped according to their body mass index (BMI) consisting of slim, normal, obese and morbidly obese groups. Significant differences were noted between the slim and morbidly obese groups in their concentrations of hair zinc levels as well as their calcium, magnesium, sodium, potassium, and copper levels. Also the groups with the highest BMI had the highest ratio of K/Na, but the lowest ratios for fe/Cu and Zn/Cu compared to the low BMI group. The study suggests that hair mineral concentrations may be correlated with adult BMI. *Concentrations of Calcium, Copper, Iron, Magnesium, Potassium, Sodium and Zinc in Adult Female Hair with Different Body Mass Indexes in Taiwan. Wang, CT, et al. Clin. Chem. Lab. Med. 43,4, 2005.*

Psoriasis

Many people who are afflicted with, or predisposed to the skin condition psoriasis should be aware of the drugs that may contribute to it's further development. These include, tetracyclines,

beta-blockers, lithium, synthetic antimalarial agents, and inhibitors of tumor necrosis factor ?. *Psoriasis.Salem, CB, et al. N.E.J.M. 361,17, 2009.*

How Cancer Wreaks Havoc on Bone

Destruction of bone by malignant tumors can be speeded up by an insulin-like hormone in the body. The hormone is known as relaxin. High levels have been linked to a number of cancers such as endometrial and prostate cancer, breast, thyroid and myeloma. Researchers found that relaxin stimulates osteoclastic cells triggering runaway bone resorption. *How Cancer Wreaks Havoc on Bone. Margottini, L. ScienceNOW. Feb. 2010.*

Comment: It is interesting that estrogen enhances the production of relaxin during pregnancy, yet this study did not tie in the relationship of relaxin to the estrogen hormone.

Reducing Dietary Sodium, The Case for Caution

Alderman asks the question, "Do observational studies by repeated, robust and consistently positive findings justify a public health recommendation." Further he sites that interventions based upon observational data is often flawed and uses the example of the 1980 National Dietary Guidelines that recommended the population-wide reduction of total fat intake which may have contributed to the unanticipated epidemic of obesity and diabetes today. The 2000 meeting of the committee withdrew these earlier guidelines. He sites thirteen observational studies that reviewed the relationship between sodium consumption and clinical outcomes. In almost half of the studies there was no association between salt intake and clinical outcomes. In four studies, sodium intake was found to be inversely associated with cardiovascular disease events. Higher salt intake was associated with worse outcomes in some societies with high salt intake, but lower salt intake was associated with worse outcomes in societies with moderate salt intake. Studies have established that reduction of salt intake sufficient to lower blood pressure also increases sympathetic activity, decreases insulin sensitivity, activates rennin angiotensin system and stimulates adolsterone secretion. Some studies show that overzealous sodium restriction may be harmful for those patients with heart failure. Alderman, states that government sanctions for the reduction of salt intake after looking at the facts is generally acknowledged to be just an opinion or common practice. *Reducing Dietary Sodium, The Case for Caution. Alderman, MH. JAMA, 303,5, 2010*

Comment: In our TEI Newsletter, 5,1, 1991 Sodium-Decrease Or Increase Your Intake?, Dr. Watts discusses the impact of sodium intake based upon individual metabolic characteristics. Some individuals who are considered sodium sensitive or who retain sodium readily would in fact benefit from sodium restriction. This is only a small percent of the population, approximately ten percent. However the majority of the population who are sodium insensitive could have a markedly negative effect from sodium restriction in their diet. In effect, a government recommendation for the universal reduction in salt intake would negatively impact the majority of the American population.

The Metabolic Syndrome

The author sites that prevalence of metabolic syndrome can be affected by shift work. Those working night or swing shifts exposed to bright lights at night and sleep deprivation can have an increase in adiposity. Adipose tissue is affected by "clock genes" which affect their level of expression and genetic variants associated with the metabolic syndrome. . *The Metabolic Syndrome. Eckel, RH, et al. The Lancet. 75, 2010.*

Cholesterol Drug Lowers LDL-C Levels But Again Fails to Show Clinical Benefit

Ezetimibe, a commonly prescribed cholesterol drug that inhibits intestinal absorption of cholesterol does reduce LDL cholesterol. However, there is no evidence that this lowering of LDL to target levels by the drug has any clinical or meaningful benefit, such as the reduction of myocardial infarct, stroke or death. Why doctors are continuing to prescribe the drug is unknown except that they are probably in a "prescribing rut" and fail to use more proven and effective measures such as niacin. The article states that many doctors focus on reaching target goals for LDL levels rather than treating the patient. *Cholesterol Drug Lowers LDL-C Levels But Again Fails to Show Clinical Benefit Mitka, M. JAMA, 303,3, 2010.*

Lung Cancer and Hormone Replacement Therapy.

A post hoc analysis of the Women's Health Initiative trial highlighted lung cancer as a new harmful effect of hormone therapy, increasing the risk profile of hormone therapy among post-menopausal women. Grant describes several mechanisms that may contribute to this increase. Hormone therapy lowers zinc and increases copper concentrations. This produces an increase in vascular over-reactivity, impairs immunity and reduces the clearance of other carcinogens by the liver. The reduction in zinc concentrations allows toxic metal accumulation, such as cadmium. *Lung Cancer and Hormone Replacement Therapy. Canonico, M, et al. Grant, ECG. Correspondence. The Lancet 375, 2010.*

Differences in Metal and Metalloid in the Hair of Normo- and Hypertensive Postmenopausal Women.

Hair samples were analyzed in a normal and hypertensive group. Elevated cadmium, manganese and sodium were significantly higher in the hypertensive group. The study concluded that HTMA results indicate that scalp hair concentrations of certain elements may be used as biomarkers for hypertension in postmenopausal women. *Differences in Metal and Metalloid in the Hair of Normo- and Hypertensive Postmenopausal Women. Gonzalez-Munoz, MJ, et.al. Hypertens. Res. Jan. 2010.*

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