

# NEWS UPDATES



JAN – FEB 2015

## Hair Zinc Levels and Dermatitis

The purpose of this study was to determine if a relationship could be found between HTMA zinc levels and the incidence of atopic dermatitis. Further, if a relationship was found would oral zinc supplementation be helpful in those with the condition. The study consisted of fifty-eight children including males and females diagnosed with atopic dermatitis. The mean age was 6.2 years. A control group was also established. HTMA studies found that those affected with atopic dermatitis had significantly reduced zinc levels compared to controls. Zinc supplementation was begun for a period of eight weeks and then both groups were reevaluated. Clinical improvements were noted in the zinc supplemented group and HTMA zinc levels increased to normal values compared to controls. *Kim, JE, et al. Hair Zinc Levels and the Efficacy of Oral Zinc Supplementation in Children with Atopic Dermatitis. Acta Derm Venereol, 94, 2014.*

---

## Hair Zinc and Copper Levels and Serum Testosterone

The minerals zinc and copper influence testosterone synthesis. Zinc is necessary for synthesis while copper can antagonize zinc and therefore, impact testosterone levels. This paper studied the association between the HTMA mineral concentrations of zinc and copper and serum testosterone levels in men. The study included eighty-eight men in a clinic of family medicine at a university hospital. Serum total testosterone was measured in the morning along with hair sample collection. Findings reported that individuals with normal serum testosterone levels had a significantly higher HTMA zinc level compared to a low testosterone group. Also, the study concluded that decreased testosterone was associated with a significant reduction of the zinc to copper ratio in hair samples. *Chang, CS, et al. Correlation between serum testosterone level and concentrations of copper and zinc in hair tissue. Biol.Trac.Elem.Res. 144, 2011.*

---

## Fats and the Neuroendocrine System

The neuroendocrine system is affected by and affects the nutritional status of the body. Fatty acids are no exception. Dietary fatty acids can alter hormone and neuropeptide concentrations as well as hormone receptors. Neuropeptides are also involved in lipid metabolism in the brain. Hormones affect the metabolism of fatty acids as well as their composition, while fatty acids in turn affect the endocrine system. The major hormones involved in lipid metabolism include, insulin, glucagon, cortisol, growth hormone and catecholamines. The normal production and function of these hormones are disrupted during chronic disease conditions, such as heart disease and diabetes which lead to alterations in tissue lipids. *Bhathena, SJ. Relationship between fatty acids and the endocrine and neuroendocrine system. Nutr. Neurosci. 9, 2006.*

## Hair Mineral Levels in Rheumatoid Arthritis Patients

This study involved the assessment of the minerals copper, iron, zinc in hair, blood and urine of patients diagnosed with rheumatoid arthritis to investigate the role of trace elements in the etiology and pathogenesis of this condition. There were two groups aged forty-six to sixty and sixty-one to seventy-five years of age, including males and females compared to aged matched healthy control groups. Results of the study revealed significantly lower levels of iron, copper and zinc in blood and scalp hair samples in arthritis patients compared to the health control groups. Conclusions of the study stated, "These data present guidance to clinicians and other professionals investigating deficiency of essential trace metals in biological samples (scalp hair and blood) of RA patients. *Afridi, HI, et al. Evaluation of status of zinc, copper and iron levels in biological samples of normal and arthritis patients in age groups 46-60 and 61-75 years. Clin. Lab. 58, 2012.*

---

## Copper and Cancer

The BRAF gene is involved in making a protein kinase that through numbers of steps send messages to cells to direct cell growth. Mutation of the BRAF gene disrupts these various pathways that have been found to be involved in a number of human and animal cancers. The research of Brady and colleagues have found that the mineral copper is involved in tumor growth. Their research found that disruption of copper transporters decreased tumor growth in mice and human cells. They suggest the chelation of copper may be a treatment for cancers that contain the BRAF mutation and state that chelation of copper in patients with Wilson Disease reduced tumor growth of human or murine cells transformed by the BRAF mutation. *Brady, DC, et al. Copper is required for oncogenic BRAF signaling and tumorigenesis. Nature 509, 2014.*

---

## Biomarkers of Mineral Status

This is an interesting report discussing the public health importance of minerals such as zinc, selenium iron and iodine, and the need for improved biomarkers of trace element status of individuals. Despite the extensive use of blood plasma or serum as biomarkers, only plasma/serum selenium is considered a primary choice as a biomarker. For instance, plasma copper and ceruloplasmin are the most often used biomarkers for copper status. They are both typically found low when there is a copper deficiency, but when levels reach a certain point due to adequate copper intake, they do not rise further and therefore, do not reflect copper intake beyond that point. Ceruloplasmin is an acute phase reactant and can be affected by stress, infections, estrogen, age and inflammation making their use as a biomarker for copper to lack specificity. Plasma zinc is the most often used biomarker of zinc status, but lacks sensitivity and specificity as well. No correlations between zinc intake or absorption and plasma zinc has been found. Additional biomarkers for minerals are discussed. *Hambidge, M. Biomarkers of Trace Mineral Intake and Status. J.of Nutr. 133, 2003.*



## **A Review of Hair Analysis for Minerals, Hormones and Drugs**

The authors of this paper present extensive evidence of the value of testing hair for drugs, hormones and minerals. Drug testing of hair samples can provide evidence of various types of drug use, including compliance and abuse. It can provide a wide window of intake that often cannot be duplicated by urine testing. The paper reviews the extensive literature available showing the value of HTMA for assessing exposure of individuals to toxic metals and well as monitor the nutritional statuses of nutritional minerals. They state that “Various mineral imbalances as revealed by hair analysis can indicate metabolic dysfunctions before any symptoms occur, and that hair analysis of minerals is used not only for diagnostic purpose but also to monitor the nutritional state of the patient until treatment benefits are achieved and the effects of the program have been stabilized.” *Ahmad, G. et al. A review Hair tissue Analysis: An analytical method for determining essential elements, toxic elements, hormones and drug use and abuse. Intl.Res.J.Appl.Basic Sci. 4, 2013.*

---

## **Zinc and the Common Cold**

It has been known for some time that the mineral zinc has an antiviral effect. Rhinoviruses are associated with the common cold by attaching itself to the nasal epithelium by an intracellular adhesion molecule. The antiviral effect of zinc to the rhinovirus is that it blocks this receptor. The authors compared the outcome of zinc supplementation with a placebo to determine its effect on duration, severity and incidence of the common cold. Their results found that zinc supplementation was associated with shorter duration of the cold. Mean duration was 4.47 days compared to 8.68 days in the low-dose users and the incidence of cold was 38.2 percent in the zinc group and 61.8 percent in the placebo group. *Das, RR, et al. Oral Zinc for the Common Cold. JAMA, 311,14, 2014.*