



InterClinical Laboratories

# Newsletter

## HAIR TISSUE MINERAL ANALYSIS

# CLINICAL UPDATES for the Health Care Professional

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## Weight Gain and Parathyroid Hormone (PTH) Excess

It is known that an increase in free intracellular calcium in adipocytes reduces the lipolytic response to catecholamines. In other words excess calcium has an effect of blunting the fat-burning enzymes in fat cells, thus contributing to weight gain or an inability to lose weight. PTH increases calcium concentrations in fat cells. Therefore, a reduction in PTH can lead to weight loss, as well as improved insulin sensitivity.

*McCarty MF, Thomas, CA (2003). PTH excess may promote weight gain by impeding catecholamine-induced lipolysis: implications for the impact of calcium, vitamin D and alcohol on body weight. Med Hypoth, 61, 5-6.*

This response would be expected from viewing HTMA studies. PTH, calcium and insulin not only reduce the ability of the body to burn fat, but also blunt the metabolic rate due to their individual and combined effect of antagonising the thyroid. PTH raises soft tissue calcium concentrations and contributes to decreased insulin sensitivity. Most people with hyperinsulinism and/or increased PTH would also suffer from hypothyroidism. Most individuals with elevated PTH and insulin levels fall into the Parasympathetic Slow 1 metabolic category. Reducing excess tissue calcium, PTH and insulin would lead to an increase in the metabolic rate due to improved thyroid expression, which would in turn affect glucose disposal, improve insulin control and contribute to weight loss.

## Diabetes Mellitus and the Endocrine System

The physiology and pathology of diabetes mellitus is complex and poorly understood. However, it appears that the endocrine system including the hypothalamus, pituitary, thyroid, gonads and vitamin D metabolism are all involved. It is known that individuals with increased parathyroid activity have alterations in carbohydrate metabolism and insulin resistance. Studies have been reported that when parathyroidectomy was performed on patients with severe, unstable diabetes mellitus,

blood glucose stabilised and improved in 77% of the patients who underwent parathyroid surgery. *Alrefai H, et al (2002). The endocrine system in diabetes mellitus, Endocrine, 18, 2.*

*Richards MI, & Thompson NW (1999). Diabetes mellitus with hyperparathyroidism: Another indication for parathyroidectomy? Surgery, 126, 6.*

*Ger H, et al. (1998). Improvement of diabetes mellitus after excision of a parathyroid adenoma, Wien Klin Wochenschr, 110, 23.*

We can see that diabetes and weight control are certainly related. We can also see that both conditions are related to multi-causal factors involving the entire neuro-endocrine system. Through HTMA we can recognise these multiple involvements and the associated nutritional imbalances.

## Neurological Disease and Children: Hair Mineral Patterns

Hair tissue mineral analysis (HTMA) was performed on a group of 153 children with neurological disorders including hyperactivity, loss of consciousness and epileptic type seizures of unknown etiology, compared to a control group. The affected group showed a significant increase in hair lead levels as well as significant reduction in hair magnesium levels.

*Lech T (2002). Lead, copper, zinc and magnesium content in hair of children and young people with some neurological disease, Biol Trace Elem Res, 85.*

## The Effects of Long-term Nutritional Deficiencies and Disease Not Considered

National nutritional recommendations and policies are based on preventing short-latency or short-term deficiency disease. Examples of short-term nutritional disease include vitamin C deficiency and rickets. It is now recognised that the long-term, inadequate intake of many nutrients leads to several major chronic diseases in industrialised nations and takes years to manifest. Nutritional requirements necessary to prevent

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