

Nutritional Support for The Thyroid Gland

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Like all of our glands, the thyroid gland needs supportive nutrients from food or supplements to act as raw ingredient precursors for its proper function. Thyroid Stimulating Hormone needs to give the cells the message to synthesize Thyroxine. Thyroxine, known as T₄, needs to be converted into active T₃. Cortisol and insulin levels need to be controlled in order for this to happen successfully and precursors and coenzymes must be available.

SUPPORTIVE HERBS: AMERICAN GINSENG ROOT, COLEUS FORSKOHLI (FORSLEAN[®])

The non-stimulating adaptogenic botanical American ginseng (*Panax quinquefolius*) helps control variations in cortisol, which can have profound deleterious effects on peripheral thyroid hormone conversion, as well as serum blood glucose and insulin levels, inducing dysglycemia and laying the foundation for metabolic syndrome.

WHY IS COLEUS FORSKOHLI EXTRACT NECESSARY FOR THYROID SUPPORT?

Coleus forskohlii is necessary for several reasons. Its active constituent forskohlin is a diterpene from the roots of *Coleus forskohlii*, known to directly activate the adenylate cyclase enzyme and raise cyclic AMP levels in many tissues. This is important because Thyroid Stimulating Hormone (TSH) stimulates all steps in the synthesis and secretion of T₃ and T₄. The first step is the binding of TSH hormone to TSH receptors located on the basal membrane of thyroid epithelial cells, followed by elevation of cyclic AMP levels, and a subsequent cascade of phosphorylation reactions via activation of protein kinase A. The final step is the secretion of thyroid hormones T₄ and T₃ which again couldn't happen without cAMP.¹⁰ Hypothyroid patients need support in the area of fat metabolism. *Coleus* is known to reduce adipose assimilation and increase the lipolysis of fats. *Coleus* aids in the following functions:

- 1) inhibiting the synthesis of adipose tissue
- 2) increasing response to lipolytic hormones which are produced in less quantity as we age
- 3) utilizing stored fat.¹⁰ It may also play a role in aiding the

production of digestive enzymes and supporting the immune system, both being helpful for hypothyroid patients.

TYROSINE, COPPER AND COLEUS FORSKOHLI

Cyclic AMP and copper, as well as tyrosine, are involved also in the production of "feel good" catecholamines such as dopamine and norepinephrine. This could be very helpful since hypothyroid patients are so susceptible to depression.¹⁰ Cyclic AMP is also a key player in regulating steroid hormone synthesis. These hormones include estrogen, progesterone and testosterone and depend on cholesterol for their making.¹⁰ Women with hypothyroidism can have very severe PMS.

CHROMIUM, ZINC AND MANGANESE

These minerals are needed for thyroid support to help control insulin since insulin blocks phosphorylation and therefore opposes the action of epinephrine and can impede thyroid hormone production.¹⁰ Chromium also helps to control cholesterol levels that often elevate in hypothyroid patients as well as control blood sugar levels which are challenged by poor adrenal and thyroid gland health.

FOLIC ACID

Hypothyroidism is associated with elevation of homocysteine as well as cholesterol. Folic acid has been shown to contribute to homocysteine normalization while thyroid metabolism is improving.¹¹ These two phenomena are apparently related, as it has been found that restoring thyroid levels to normal through supplementation with thyroid hormones significantly reduces serum homocysteine levels - a desirable outcome. In one study, for example, it was found that normalizing thyroid hormone levels in 14 hypothyroid patients sharply reduced their homocysteine levels, with a median drop of 44%.¹¹ Folic acid is also highly recommended for pregnant women for preventing birth defects. Babies born to hypothyroid mothers have increased incidence of birth defects.

N-ACETYL L-TYROSINE AND IODINE

Tyrosine and iodine are intimately involved in the synthesis of Thyroxine. N-Acetyl L-Tyrosine is much more stable and better absorbed than L-Tyrosine. Vitamin B2 supports these enzymatic conversions. A lack of iodine is a known contributing cause of goiter. Potassium iodide has been shown to protect the thyroid gland from radiation damage.¹ Potassium levels are often low in patients with poor thyroid and poor adrenal function. Potassium is necessary for getting thyroid hormone into our cells and is very energizing.

SELENIUM

Selenium is a key cofactor in the enzymatic conversion (ID-I enzyme) of T4, thyroxine hormone, to the more active T3, triiodothyronine. Selenium also protects the thyroid gland from mercury damage and from free radical damage caused by chemicals and heavy metals. Selenium helps to make the powerfully protective enzyme glutathione peroxidase.

A study looked at how selenium deficiency affected ID-I enzyme (I iodothyronine 5'-deiodinase) levels in the body. Selenium deficient rats had the following results: 1). Hepatic and renal ID-I activities decreased by 60% and 50% respectively, serum levels of T3 reduced 36%, and T4 increased by 32%. 2). GSH-Px (glutathione peroxidase) activities in the whole blood and liver decreased by 61% and 82% respectively. LPO (lipid peroxide) concentrations in serum and liver increased by 53% and 40% respectively.³ The results of a Graves' disease study clearly indicated that supplementation with antioxidants in the treatment of Graves' disease is justified, particularly those containing selenium.⁵

VITAMIN A, ZINC AND SELENIUM

Studies tell us that TTR (Transthyretin) an extracellular transfer protein in humans is responsible for binding both T4 and T3 with a preference for T4. This protein also binds vitamin A known to be important for Thyroid function. TTR is an extra cellular transport protein involved in the distribution of thyroid hormones and vitamin A. Hypothyroid patients often have a yellow-orange coloring to their skin because of very poor conversion of beta-carotene into vitamin A.⁶ Zinc is needed for this conversion. Significantly lower levels of zinc and selenium are found in the thyroids of patients with thyroid cancer compared to other thyroid patients.⁷ Zinc is likely as potent a thyroid antioxidant as selenium is. Both of these minerals protect against heavy metals.

Q: CAN SELENIUM SUPPLEMENTATION HELP THYROIDITIS?

A: Thyroiditis is inflammation of the thyroid gland. The most common type is autoimmune thyroiditis, in which, for complicated reasons, the body attacks the thyroid gland, decreasing its production of thyroid hormones.

Selenium appears to have two essential functions related to thyroid health. First, it is a component of the detoxifying enzyme glutathione peroxidase. If selenium is unavailable, this enzyme does not work as effectively. Since glutathione peroxidase helps to quench free radicals, lowered activity may result in increased free-radical generation and increased damage to an already inflamed thyroid gland. Second, selenium is a key cofactor in the enzymatic conversion of thyroid hormone thyroxine (T4) to the more active triiodothyronine (T3) making selenium important for healthy thyroid function. In two recent studies, researchers tested this idea by giving subjects T4 with or without selenium supplements. In both studies the combined supplementation of T4 and selenium, compared with T4 only, was beneficial in decreasing the autoimmune-induced inflammation as measured by antibodies against thyroid peroxidase, particularly in those with very high antibody levels.¹² These two studies do show selenium is helpful and well-tolerated at the dose of 200 mcg daily.^{12,13}

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