

SELENIUM AND THYROID FUNCTION

Abstract: The understanding of the essential role of selenium (Se) in thyroid hormone synthesis, metabolism and action, as well as normal thyroid function, increased during the past decades. The thyroid gland is among the human tissues with the highest Se content, per mass unit, similar to other endocrine organs and brain.

Biological actions of Se are mediated, in most cases, through the expression of at least 30 selenoproteins coded by 25 selenoprotein genes in human. Via the selenoproteins, selenium can influence cell function through antioxidant activities, modifying redox status and thyroid hormone synthesis and metabolism. Selenoproteins iodothyronine deiodinases are present in most tissues and have a role to increase the production of bioactive tri-iodothyronine.

Furthermore, Se has been shown to be important in the regulation of immune function. Se deficiency is accompanied by loss of immune competence. The links between Se deficiency, altered immune function and inflammation have prompted studies in humans to examine if Se supplementation can modify auto-antibodies production in patients with chronic autoimmune thyroiditis. Until now, several randomised prospective clinical trials have been performed in patients with established chronic autoimmune thyroiditis. The clinical endpoint of each study was the decrease in TPO antibodies concentration after 3-12 months of treatment. Usually, the dosage of daily Se supplementation was 200µg.

Selenium supplementation had no significant effect on the concentration of TSH or thyroid hormone concentrations. These studies indicate that Se treatment result in reduced inflammatory activity, but it does not cure chronic autoimmune process.

Key words: thyroid gland, trace element, selenium