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Selenium in thyroid autoimmune disorders

Poupak Fallahi, Alessandro Antonelli and Silvia Martina Ferrari
University of Pisa, Italy

Different human diseases, as cancer, impaired immune function, neurodegenerative and age-related disorders and disturbances of the thyroid hormone axis, are related to an insufficient supply of the essential trace element selenium. For example, its deficiency, in combination with inadequate iodine, is involved in the pathogenesis of myxedematous cretinism. Selenium naturally occurs in an inorganic (mineral or metallic) or organic form (selenomethionine and selenocysteine), and its biological action is exerted through selenoproteins. The thyroid gland has the highest selenium content per gram of tissue of the whole body. In cellular antioxidative defence systems and redox control [the glutathione peroxidase (GPx) and the thioredoxin reductase (TxnRd) family] contribute in protecting the thyroid from an excess of hydrogen peroxide and reactive oxygen species, derived from the biosynthesis of thyroid hormones. Moreover, the three major enzymes involved in activation and inactivation of thyroid hormones are selenoproteins. Serum selenium concentrations decrease in inflammatory conditions and can vary according to the severity and duration of the inflammation. For this reason, the effect of selenium supplementation seems to be useful. Moreover, selenium is able to improve the activity of T cells and the cytotoxicity of natural killer cells, resulting efficacious in viral diseases. However, whether selenium supplementation is effective in patients with Hashimoto Thyroiditis is still not clear, even if it seems advantageous in cases of mild/moderate Graves' Orbitopathy. In conclusion, further studies are necessary to evaluate whether selenium supplementation could be effective in autoimmune thyroid disorders.

Biography

Poupak Fallahi graduated in Medicine and Surgery in 1993 and specialized in Occupational Health Medicine in 1999 at the University of Pisa (Italy). Her principal areas of expertise are autoimmune thyroid disorders, Type 1 diabetes, chemokines and cytokines, systemic autoimmune disorders, HCV-associated thyroid disorders and thyroid cancer. Her researches have been published in more than 200 articles on International journals (H_I=46). She serves as an editorial board member and is Referee and Reviewer of many scientific International journals.

poupak@int.med.unipi.it

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