

RELATIONSHIP BETWEEN THYROID STIMULATING HORMONE AND ANTIOXIDANT STATUS IN PATIENTS WITH SUSPECTED THYROID DYSFUNCTION

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Thyroid hormones play a major role in the regulation of basal metabolic rate and in oxidative metabolism. In hyperthyroid conditions metabolic activities are increased leading to an increase in the total consumption of oxygen. These conditions can promote formation of reactive oxygen species and other free radicals, resulting in oxidative stress and impairment of the antioxidant system.

The study was conducted on antioxidant status and thyroid stimulating hormone (TSH) of patients aged between 15 and 85 years, who were referred to the Nuclear Medicine unit to assess their thyroid function from September to December 2013. At the time of sample collection patients were not on thyroxine or anti thyroid drugs. Ethical clearance was obtained from Postgraduate Institute of Science, University of Peradeniya. Serum TSH level was measured using immuno-radiometric assay. Antioxidant status was estimated by serum Total Antioxidant Capacity (TAC) using Ferric Reducing Ability of Plasma, and the extent of protein oxidation was assessed by the serum protein thiol concentration using Ellman's method.

The study population (n=93) had a mean TSH of 5.4±12.3 mU/L. Mean TAC of the study group was 719.1±164.5 µmol/L and mean Protein thiol was 517.7±89.5 µmol/L. Majority of the study group n=85 (91.4%) were females and 8 (8.6%) were males. In the study group, 22 patients (23.7%) were aged below 35 years, 37 (39.8%) were aged between 35 to 50 years, while 34 (36.5%) were aged above 50 years. There was no significant correlation between TSH and TAC (P=0.103) or TSH and protein thiol (P=0.269). In the study population, 9 (9.7%) patients were hyperthyroid, 68 (73.1%) were euthyroid while 16 (17.2%) were hypothyroid. There was a significant positive correlation between TSH and TAC (r=0.526, P=0.036) in hypothyroid patients. Serum TAC and protein thiol concentrations of females had a significant negative correlation (r= -0.263, P=0.015). In contrast, no significant correlation was observed between TAC and protein thiol concentrations in males (r=0.487, P=0.221). No significant correlations were observed between TSH and TAC or TSH and protein thiol in any age group. But the TAC in patients >50 years of age (466.2 µmol/L) was significantly lower than that of patients between 35–50 years (524.7 µmol/L). In contrast mean protein thiol significantly increased with the increase in age.

The study thus concludes that, there is a significant positive correlation between TSH and TAC in hypothyroid patients. There were no significant differences in TAC and protein thiol concentrations between the hypothyroid, euthyroid and hyperthyroid patients.