

URINARY IODINE EXCRETION, THYROID STIMULATING HORMONE AND ANTIOXIDANT STATUS IN PATIENTS WITH SUSPECTED THYROID DYSFUNCTION

A. M. S. M. Wickramaratne

Postgraduate Institute of Science, University of Peradeniya
Department of Biochemistry, Faculty of Medicine, University of Peradeniya
Nuclear Medicine Unit, Faculty of Medicine, University of Peradeniya

Iodine is a vital component of thyroid hormones. Most of the ingested iodine is excreted in urine. Therefore urinary iodine concentration (UIC) is a good indicator of the adequacy of the iodine intake. Thyroid hormones are involved in the regulation of basal metabolic rate and in oxidative metabolism. Changes in thyroid gland function can affect formation of reactive oxygen species and other free radicals, resulting in oxidative stress and impairment of the antioxidant system.

The objective of this study was to estimate urinary iodine excretion and antioxidant status of consecutive patients referred to the Nuclear Medicine Unit to assess the thyroid function from September to December 2013. At the time of sample collection patients were not on thyroxine or antithyroid drugs. Ethical clearance for the study was obtained from the Postgraduate Institute of Science, University of Peradeniya. Serum thyroid stimulating hormone (TSH), UIC, serum total antioxidant capacity (TAC), serum protein thiol and thiobarbituric acid-reactive substance (TBARS) concentrations of the subjects were estimated.

The study population (n=93) had a mean UIC of 268.8 ± 197.0 $\mu\text{g/L}$. Only one patient (1.1%) had iodine deficiency, 48 (51.6%) had normal UIC, 21 (22.6%) had UIC above adequate range, and 23 (24.7%) had excess UIC status. Mean TSH of the study population was 5.4 ± 12.3 mU/L. In the study population, 9.7% had suppressed TSH, 73.1% had normal TSH while 17.2% had elevated TSH. Patients with suppressed TSH had a significant positive correlation between TSH and UIC ($r = 0.716$, $P = 0.030$). There was a significant positive correlation between TSH and TAC ($r = 0.526$, $P = 0.036$) in patients with elevated TSH. There was no significant correlation between TSH and TAC, protein thiol or TBARS. In the study group, 41.9% had enlarged thyroid.

The study revealed that, nearly half of the study group had high UIC despite normal TSH levels. TSH had significant positive correlations with a) UIC in patients with suppressed TSH and b) TAC in patients with elevated TSH. There were no significant differences in UIC, TAC and protein thiol or TBARS concentrations between the three TSH groups.