ABSTRACT OF THE THESIS

Title: STUDIES ON GOITROGENIC / ANTI-THYROIDAL ACTIVITY OF CERTAIN INDIAN PLANT FOODS IN ANIMAL MODEL

Thyroid hypo-function can be caused or aggravated by thiocyanate or flavonoids generating food items. In India, vegetarianism is dominant and culturally preferred food habit. The number of plant foods consumed by the people of the country is very large and many of them are reported to have goitrogenic substances, like cyanogenic glucosides, glucosinolates, thiocyanate and polyphenols.

It has been found that goitrogens in different concentrations are present in peanut seed coat, moringa leaves, spinach and sugarcane juice and thus they might be responsible for dysfunction of the thyroid gland after their continued consumption. However, to date there have been no detailed studies. In this context therefore, the objective of the present study is to explore the goitrogenic / anti-thyroid potentiality of those plant foods in experimental animal model after prolonged feeding for the different durations of those plant foods respectively by replacing a portion of the diet and analyzing thyroid gland weights, histoarchitecture of thyroid gland, TPO, (Na⁺-K⁺)-ATPase, thyroidal 5'-deiodinase I (DI) activities and thyroid hormone profiles.

Enhanced excretion of thiocyanate, along with iodine were noted in the studied plant fed groups indicating that cyanogenic glucosides and glucosinolates present in those plant foods were metabolised to thiocyanate and excreted through urine along with excess. There occurs hypertrophy and hyperplasia of thyroid follicular cells surrounding the relatively small thyroid follicles in experimental animals that resemble the development of morphological hypothyroidism in the selected plant fed groups as compared to control. In consistent with these a relative state of biochemical hypothyroidism also developed as evidenced by decreased activities thyroid hormone synthesizing and low serum circulating total T4 and T3 levels with enhanced serum TSH levels in the experimental groups of animals as compared to controls. All observations suggest that studied plant foods in Indian origin containing cyanogenic glucosides, glucosinolates, thiocyanate and polyphenols are the potent disrupter of thyroid gland function even in present of iodine.

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