RESEARCH PAPER International Journal of Medical Sciences (April & October, 2011) Vol. 4 Issue 1& 2 : 1-6

Evaluation of Thyroid Profile Among The Diabetic Patients in South Indian Rural Population

K.SATYA NARAYANA, SRAVANTHI KOORA, IVVALA ANAND SHAKER, S.SALEEM BASHA AND K. SURESH BABU

See end of the article for authors' affiliation

Correspondence to :
K. SATYA NARAYANA
Department of Biochemistry, Melmaruvathur Adhiparasakthi Institute of Medical Sciences, MELMARUVATHUR (T.N.) INDIA

ABSTRACT

Both diabetes and thyroid disorders involve dysfunction of the endocrine system. Almost one third of people with type 1 diabetes have been found to have thyroid disease. Since both diseases are parallel and influence one another. Any alteration in thyroid hormones may have further complication such as CAD. Low T_3 syndrome is well established in development of CAD. In the present study we assessed the circulating thyroid hormones and glycemic status among Diabetic population. T_3 levels are low in both Type I and II diabetes, and are directly correlated with poor glycemic control. Among the diabetic population women are worse affected than men. In conclusion, many diabetics showed a low T_3 levels, suggesting that there may be impairment in the extrathyroidal conversion of T_4 to T_3 (5' deiodinization) and in turn enhanced by a poor glycemic control. The study reveals that frequent checkup for thyroid hormones are compulsory to prevent further complications.

Narayana, K.Satya, Koora, Sravanthi, Shaker, Ivvala Anand, Basha, S. Saleem and Babu, K. Suresh (2011). Evaluation of Thyroid Profile Among The Diabetic Patients in South Indian Rural Population. *Indian J. Med. Sci.*, **4**(1 &2):1-6.

Key words : Glycemic status, Diabetes mellitus, Thyroid dysfunction, 5' deiodinization, Low T_3 syndrome, CAD

Received : *November, 2010*
Revised : *April, 2011*
Accepted : *July, 2011*

Diabetes mellitus and thyroid diseases are the two common endocrinopathies seen in the adult population. Insulin and thyroid hormones influence each other actions. With insulin and thyroid hormones being intimately involved in cellular metabolism and thus excess or deficit of either of these hormones could result in the functional derangement of the other. Asymptomatic thyroid dysfunction is one of the more common occurrences in diabetic population particularly in type I diabetes (Perros *et al.*, 1995). Thyroid disorders are also common in type II diabetes because both of these illnesses tend to occur more frequently as age advances.

In euthyroid individuals with diabetes mellitus, the serum T_3 levels, basal TSH levels and TSH response to thyrotropin releasing hormone (TRH) may all be strongly influenced by the glycemic status (Schlienger *et al.*, 1982). Poorly controlled diabetes, both Type I and Type II, may induce a "Low T_3 state" characterized by low serum total and free T_3 levels, increase in reverse T_3 (rT_3) but near normal serum T_4 and TSH concentrations (Donckear, 2003).

Low serum T_3 is due to reduced peripheral conversion of thyroxine (T_4) to tri-iodothyronine (T_3) via 5'monodeiodination reaction. Studies indicate that it may be the long term diabetic control that determines the plasma T_3 levels (Schlienger *et al.*, 2003). Poorly controlled diabetes may also result in impaired TSH response to TRH or loss of normal nocturnal TSH peak. TSH responses and "low T_3 state" may normalize with improvement in glycemic status but even with good diabetes control, the normal nocturnal TSH peak may not be restored in C-peptide negative patients *i.e.* those with totally absent pancreatic beta cell function (Coiro *et al.*, 1997).

The deiodinases are seleno enzymes that regulate triiodothyronine (T_3) availability in peripheral tissues. Most of the T_3 present in tissues is produced from thyroxine (T_4) by 5' deiodination. Two Isoenzymes catalyze the activating pathway: type I and type II 5' deiodinases. D2 is upregulated in hypothyroidism (5). The effect of insulin on the deiodinases has also been studied. Insulin up regulates hepatic T_3 production has been described in 'low T_3 syndromes'. In insulin deprivation (as in diabetes and fasting), T_3 production is low due to low hepatic D_1