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General Medicine

PREVALENCE OF THYROID DYSFUNCTION IN TYPE 2 DIABETES PATIENTS IN AN TERTIARY CARE GOVERNMENT GENERAL HOSPITAL

Dr. Chandana Kaspa — Assistant professor, Department of general medicine, Government medical college, Srikakulam.

Dr. Srujana N — Assistant professor, Department of general medicine, Government medical college, Srikakulam.

ABSTRACT **Introduction:** Diabetes mellitus and thyroid disorders are the leading endocrine disorders worldwide. Over the years it has been evident that there exists a strong relationship between thyroid and diabetes. The prevalence of thyroid disorders among diabetes patients is still not known. So we conducted a study to find out thyroid dysfunction in Type 2 diabetes mellitus patients in our hospital. **Objectives:** To establish the prevalence of thyroid dysfunction in type 2 diabetes mellitus and to know the distribution of thyroid dysfunction in diabetic patients of thyroid dysfunction in type 2 diabetes mellitus. **Materials And Methods:** This study was conducted on 380 diabetic patients. All the participants were evaluated for thyroid dysfunctions by testing thyroid profiles. The correlation of prevalence of thyroid disorder with age distribution, gender distribution, duration of diabetes, and HbA1C was then done. **Results:** Thyroid dysfunction was detected in 76 out of 380 T2DM patients. Prevalence of thyroid dysfunction was found to be 20% in patients with Type 2 diabetes mellitus. Thyroid dysfunction was more common in females (60.5%) when compared with males (39.5%) and subclinical hypothyroidism ((76.3%) was the most common finding. **Conclusions:** In the present study showed a high prevalence of thyroid dysfunctions (20%) in diabetic patients. So, we advise that screening for thyroid dysfunction among patients with diabetes mellitus should be routinely performed, to recognize these dysfunctions early.

KEYWORDS : Type 2 diabetes, Subclinical Hypothyroidism, Thyroid Dysfunction

INTRODUCTION:

Type 2 Diabetes Mellitus (DM) is the most common endocrine disorder encountered in clinical practice. Variable interaction of environmental and hereditary factors along with defective insulin secretion from pancreatic β- cells or insulin resistance results in hyperglycemia in Type 2 DM patients[1]. DM and thyroid disorders are two of the most common endocrine conditions, which often occur with each other [2,3]. Thyroid dysfunction is second only to diabetes mellitus as the most frequent condition affecting the endocrine system. Various studies have shown the prevalence of 2.2 % to 17 % of thyroid dysfunction among the diabetic patients[4,5]

Thyroid hormones and insulin are the antagonists and both are involved in the cellular metabolism of carbohydrates, proteins, and lipids. The functional impairment occurs in thyroid hormone as well as insulin if their levels changed.[6] DM appears to influence thyroid function in two sites; firstly, at the level of hypothalamic control of TSH release, and secondly at the conversion of T4 to T3 in the peripheral tissue. Hyperglycemia causes reversible reduction of the activity and hepatic concentration of T4-5-deiodinase, low serum T3, increase in reverse T3, and also variation in the level of T4. [7]

The diagnosis of thyroid dysfunction in diabetic patients based solely on clinical manifestations can be difficult because signs and symptoms of thyroid disorders are similar to those of diabetes and can be overlooked or attributed to other medical disorders. So, this study aimed to find out the prevalence of thyroid dysfunction in type 2 diabetes mellitus.

MATERIALS AND METHODS:

This hospital-based study was conducted in the Department of Medicine at the government general hospital, Srikakulam, Andhrapradesh Over one year. A total of 380 patients between 20 - 70 years satisfying American Diabetic Association criteria for the diagnosis of Type 2 DM were included in the study[8].

In all the patients, systemic evaluation comprising a complete medical history, general physical examination with height and weight measurement, measurement of routine biochemistry, serum TSH, T3 & T4 levels were done. Patients with a previous history of thyroid dysfunction and those on drugs influencing the thyroid profile were excluded from the study. Based on the American Thyroid Association guidelines, patients were divided into euthyroid, subclinical hypothyroidism, overt hypothyroidism, hyperthyroidism, and subclinical hyperthyroidism groups[9]. Serum TSH, T3, and T4 levels were estimated using the chemiluminescence immunoassay (CLIA) method. The relationship of thyroid dysfunction with age distribution, gender distribution, duration of diabetes, and HbA1C was evaluated using the appropriate statistical method. The observations and interpretations were recorded and the results obtained were statistically analyzed.

RESULTS:

In this study, 380 established diabetics with Mellitus type 2 were screened for Thyroid disorders by Thyroid function tests. Abnormal thyroid function was found in 76 (20%) type 2 DM cases and the remaining diabetics had normal thyroid function (304). Out of 76 thyroid dysfunction cases male 30 (39.5%) and female 46 (60.5%). Among 76 cases Subclinical hypothyroidism was noted in 58 (76.3%) cases, Hypothyroidism was seen in 10 cases (13.2 %) and 8 (10.5%) subjects had hyperfunctioning of the thyroid gland. We have found that the prevalence of thyroid dysfunction was more among females than in males.30 (21.4%) out of 140 male patients had thyroid dysfunction whereas 46 (28%) out of 164 females were suffering from a thyroid disorder. The mean age of diabetics with thyroid dysfunction (62.5 ± 7.6 yrs) was higher than euthyroid (53.6 ± 8.3 yrs). All cases we checked for HbA1C levels Only 34% (64/188) patients with poor glycemic control (HbA1C ≥7%) had thyroid dysfunction, while 66% were euthyroid and 6.25% (12/192) patients with good glycemic control (HbA1C<7%) had thyroid dysfunction.

Table1: Distribution Of Thyroid Dysfunction In Diabetic Patients (Gender-Based)

Type Of Thyroid Dysfunction	Total	Male	Female
Subclinical Hypothyroidism	58	22	36
Hypothyroidism	10	3	7
Hyperthyroidism	8	5	3
Euthyroid	304	140	164

Table 2: Correlation Of Thyroid Dysfunction With HbA1C

Thyroid dysfunction	HbA1C <7	HbA1C >7	P value
Present	12	64	<0.0001 Significant
Absent	180	124	

DISCUSSION:

The association between diabetes and thyroid dysfunction was first identified in 1979.[10] Hence it is common for an individual to be affected by both thyroid diseases and diabetes. This study aimed to evaluate the prevalence of thyroid dysfunctions in type 2 diabetic patients. In the present study, thyroid dysfunctions were found in 20% of diabetic T2DM patients.

The observations of our study are consistent with studies of Singh P et al[11] and Babu K et al[12] who demonstrated an overall prevalence of 29 % and 28 %, respectively, of thyroid dysfunction in Type 2 DM patients.

However, studies by Radaideh et al[13], Perros et al [14]and Papazafiropoulou et al[15], showed a lower prevalence (12.5%, 13.4%, and 12.3% respectively) of thyroid dysfunctions in diabetic patients.
The most prevalent thyroid disorder in diabetic patients was subclinical hypothyroidism occurring in 15.3%, followed by hypothyroidism in 2.6%, and hyperthyroidism in 2.1%. Our results are in concordance with the results of Perros et al[13], Celani et al[16], Babu et al[12,] and Radaiedeh et al[14].

In the present study, the prevalence of thyroid disorders was more in females as compared to males (60.5% versus 39.5%). Our results are consistent with studies of Papazafiropoulou et al[15], Celani et al[16], Babu et al[12,] and Michalek et al[17]. Thus, the prevalence of thyroid disorders in diabetic patients is influenced by the female gender.

The prevalence of thyroid disorders in diabetics was more in patients with HBA1C < 7 (15.8%)as compared to patients with HBA1C ≥ 7(84.2%) and its statistically significant P value was <0.0001. However, studies by Schlienger et al[18], Bazrafshan et al[19,] and Ardekani et al[20], found thyroid dysfunctions significantly higher in diabetics with higher HBA1C. The benefits of identifying thyroid dysfunction at an early stage, and even in a symptomatic patient are considerable because progression to overt thyroid dysfunction is associated with consequent morbidity including the adverse effects on lipid and bone metabolism.

CONCLUSION:

This study showed a high prevalence (20%) of thyroid dysfunctions in patients with type 2 diabetes mellitus. Subclinical hypothyroidism was more common than other thyroid dysfunctions, which constituted 15.3 % of the thyroid dysfunction in diabetics. This study suggests that diabetic patients should be screened for asymptomatic thyroid dysfunction. This will improve their quality of life and reduce their morbidity rate in them.

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