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Original Research Article

PREVALENCE OF THYROID DYSFUNCTION IN PATIENTS WITH TYPE 2 DIABETES MELLITUS

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Abstract

Background: Patients with type 2 diabetes mellitus are more prone to thyroid disorders. Hypothyroidism in them leads to an aggravation of microvascular complications. Diabetic patients with hypothyroidism also are at an increased risk of cardiovascular disease. Screening for thyroid dysfunction in diabetic patients will allow early treatment of hypothyroidism.

Methods: All patients were evaluated for thyroid status; assessment of T3, T4 and TSH levels and Blood glucose levels and HbA1c.

Results: 22.00% patients were present with subclinical hypothyroidism, 18.00% patients were present with hypothyroidism and 4.00% patients present with hyperthyroidism

Conclusion: Screening for thyroid disease disease among patients with diabetes mellitus should be routinely performed for early detection and treatment of thyroid dysfunction to delay the complications of diabetes

Keywords: Thyroid, Type-2DM, Complication

Introduction

Patients with type 2 diabetes mellitus are more prone to develop thyroid disorders. Many diabetic patients show features of thyroid dysfunction over a period of time.[3] Insulin resistance plays an important role in the development of hypothyroidism in patients with type 2 diabetes mellitus. Hypothyroidism in diabetic patients leads to an aggravation of dyslipidemia, hypertension and cardiovascular disease.[1-3] Thus, it is necessary to recognize and treat hypothyroidism in diabetic patients to prevent worsening of diabetic complications.[4] Hypothyroidism can be diagnosed with the help of a simple blood test which is readily and easily available. This can be performed by the primary care physician involved in treating diabetic patients. Early treatment of thyroid dysfunction in diabetic patients will help in normalizing their glycemic status and lipid profile.

Materials and Methods

- Type of Study: A Hospital based study

Inclusion criteria:

All patients with Type 2 diabetes Mellitus.

Exclusion criteria:

- Patients with history of alcohol consumption for any duration of time were excluded.
- Persons with previous history of jaundice, ascites and signs of liver cell failure will be excluded.
- Patients with history of intake of Methotrexate, Amiodarone, Glucocorticoids, Synthetic estrogens, Nucleoside Analogues (ddI, AZI) or any other hepatotoxic drug will be excluded.
- Patients with history of Chronic Renal Failure and Ischemic Heart Disease.
- Pancreatitis.
- Steroid induced Diabetes, will be excluded from the study.

Methodology

1. A detailed history and examination was conducted as per the proforma.
2. All patients were undergo evaluation for diabetes.
3. All patients were evaluated for thyroid status; assessment of T3, T4 and TSH levels and Blood glucose levels and HbA1c.
4. The laboratory evaluation of thyroid functions were conducted by estimation of serum T3, T4 and TSH levels by chemi-lumiscence assay method. 2 ml of blood would be drawn and will be centrifuged and the serum (500microml) collected from that and will be incubated with the reagent (separate for T3, T4 and TSH) for about 1 hour at room temperature..
5. HbA1c and FBS levels was checked.

Results

In our study, maximum patients (52.00%) were from less than 46-60 Yrs followed by 26.67% patients were less than 45 yrs and 21.33% patients were more than 60 yrs age. 62.00% patients were female and 38.00% patients were

male.In present study, FBS was 153.62±71.23 mg/dl, PPBS was 245.12±110.24 mg/dl and Hb1Ac was 7.45±2.01%.

Table 1: Thyroid profile wise distribution.

Variable	Mean	SD
Free T3 (pg/ml)	2.42	0.76
Free T4 (ng/ml)	1.31	0.36
TSH (µU/L)	4.24	6.12

In present study, free T3 was 2.42±0.76 pg/ml, free T4 was 1.31±0.36 ng/ml and TSH was 4.24±6.12 **µU/L.**

Table 2: Distribution of various thyroid parameters

Thyroid biochemical parameters		No of cases	Percentage
Free T3 (pg/ml)	**Low (<1.4)**	4	2.67
	Normal (1.4 to 4.2)	145	96.67
	High (>4.2)	1	0.67
Free T4 (ng/ml)	**Low (<0.8)**	18	12.00
	Normal (0.8 to 2)	130	88.67
	High (>2)	2	1.33
TSH (µU/L)	**Low (<0.3)**	8	5.33
	Normal (0.3 to 4)	107	71.33
	High (>4.00)	35	23.33

4.67 % patients had low free T3 and 0.67 % patients had low free T3. 12.00% patients had low free T4 and 1.33% patients had high free T4. 5.33% patients had low TSH and 23.33% patients had high TSH.

Table 3: Distribution of thyroid dysfunction

Classification	No of cases	Percentage
Normal	90	60.00
Hypothyroidism	27	18.00
Hyperthyroidism	6	4.00
Subclinical Hypothyroidism	33	22.00
Total	150	100.0

In present study 22.00% patients were present with subclinical hypothyroidism, 18.00% patients were present with hypothyroidism and 4.00% patients present with hyperthyroidism.

Discussion

Diabetes mellitus is one of the most important health problems in the population worldwide and in spite of advances in treatment, a huge number of patients present with complications owing to poor glycaemic control. One of the vital factors that contribute to deprived glycaemic control is thyroid dysfunction, which tends to happen with diabetes mellitus. This study tries to find out the prevalence of thyroid dysfunction in people with type 2 diabetes mellitus in our region. There is a complex interaction between DM and thyroid disorder. Because of a closely involved relation between insulin and thyroid hormone cellular metabolism, any abnormal levels of either of them may result in a functional derangement of the other.

In present study, 22.00% patients were present with subclinical hypothyroidism, 18.00% patients were present with hypothyroidism and 4.00% patients present with hyperthyroidism.

DM and thyroid diseases are the two endocrine diseases seen commonly in the population. There is an inter-dependence between insulin and thyroid hormones for normal cellular metabolism so that DM and thyroid diseases can mutually influence the other disease process.[5]

On one hand, thyroid hormones contribute to the regulation of carbohydrate metabolism and pancreatic function, and on the other hand, diabetes affects TFT to variable extents. Studies have found that diabetes and thyroid disorders tend to coexist in the majority of the patients.

Thyroid disorders can have a major impact on glycaemic control and an untreated thyroid disorder affects the management of patients with diabetes. Consequently, a systematic approach to thyroid testing in patients with diabetes is recommended earlier which will prevent the occurrence of cardiovascular complications and other diabetic complications such as nephropathy and retinopathy.[6]

Thus, the detection of abnormal hormone levels in addition to other biochemical variables in the early stage of diabetes will help patients to improve their health and reduce the mortality and morbidity.

Vaghasiya K et al [7] were found that 50 diabetic patients (cases) and 50 non-diabetic patients (control) were screened for thyroid dysfunction by thyroid function tests (TFT). Abnormal thyroid function was found in 14 (28%) DM cases and 50 control had normal thyroid function, which is statistically significant. They have found that there is variation in the TSH, T3 and T4 levels, found in diabetics and diabetics with thyroid disorders. Patients with thyroid disorders had a higher level of TSH compared to those without thyroid diseases whereas there was not much of a difference in T4 and T3 levels.

Conclusion

Screening for thyroid disease disease among patients with diabetes mellitus should be routinely performed for early detection and treatment of thyroid dysfunction to delay the complications of diabetes

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