



A STUDY OF THYROID DYSFUNCTION IN PATIENTS AMONG TYPE 2 DIABETES MELLITUS

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ABSTRACT

Introduction: Type 2 diabetes mellitus (DM) is a growing problem in our country and we have observed that many patients are associated with thyroid dysfunction later in their life. However, the prevalence of thyroid dysfunction in these patients has not been investigated.

Aims and Objectives: To find the prevalence of thyroid dysfunction in type 2 DM.

Materials and Methods: In this retrospective study, data of 100 Type 2 DM patients (Age >40 years) who attended the diabetic clinic and OPD and IPD New medical college hospital kota from January 2016 to December 2017 and whose T3, T4, thyroid stimulating hormone (TSH) level was investigated were included. The inclusion criteria are known cases of type 2 DM. Exclusion criteria are patients with previous history of hypothyroidism and those on drugs affecting the thyroid profile.

Results: Out the 100 type 2 DM patients for the study of which 70 patients below (< 60 yrs) 1 had sub-clinical hypothyroidism, 2 hypothyroidism and 4 of them were hyperthyroid and out of 30 elderly patients (> 60 years) we found 4 with sub-clinical hypothyroidism and 2 hyperthyroidism, 1 hypothyroid case was noted in elderly people. In this study prevalence of sub-clinical hypothyroidism (13.4%) was more in >60 yrs. (elderly patients) compared to 1.4% in < 60 yrs. age group, where as 5.7% <60 years had hyperthyroidism as compared to that of 6.7% among >60 years age group. Hypothyroidism was present in 2.9% of people below the age of 60 yrs where as 3.4% of the elderly (> 60 years) had hypothyroidism.

Conclusion: Prevalence of hypothyroidism is quite high in type 2 DM patients above 40 years and . Thyroid disorders are more in females 71.42% than males 28.58% in diabetic patients

KEYWORDS : TSH, thyroid dysfunction, type 2 DM.

INTRODUCTION:

Diabetes Mellitus (DM) has emerged as pandemic health problem in the world and it is a common endocrine disorder, which has reached 20% in urban population and 10% in rural population in India. The prevalence of thyroid dysfunction in DM is increasing alarmingly. The World Health Organization (WHO) has projected that the global prevalence of diabetes will increase to 300 million (7.8%) by 2030 [1]. Some of the factors like sedentary lifestyle, hypertension, dietary indiscretions, ethnicity and obesity are thought to be major contributions [2]. The association of thyroid dysfunction with type II DM is widely known and this study was first published in 1979 [3-4].

The thyroid hormones directly controls insulin secretion. In hypothyroidism there is a reduction in glucose-induced insulin secretion by beta cells and catecholamines are increased in hyperthyroidism, and insulin resistance will be increased [5-7]. The DM influences the thyroid dysfunction in two sites, first at the level of hypothalamus by controlling TSH release and second at the peripheral tissues by converting T4 to T3 [8-9].

It was reported that type 2 DM patients with subclinical hypothyroidism are at risk of complications like neuropathy and cardiovascular events [10]. Studies suggested that detection of subclinical hypothyroidism especially in type II DM is required to avoid further complications.

There are contradictory reports regarding the prevalence of thyroid dysfunction among normal and patients with type II DM [11]. Hence the study was designed to assess the status of thyroid function in type II DM.

AIMS:

1. To estimate the thyroid hormones such as T3, T4 & TSH in type II diabetes mellitus patients and to assess the diabetic status, Fasting Blood Glucose (FBS) will be measured.
2. To know the spectrum of thyroid dysfunction in diabetes mellitus.

MATERIALS AND METHODS:

This is a prospective study which was carried out in the OPD/IPD and diabetic clinic in New Medical College Hospital Kota Rajasthan. The study population consisted of 150 subjects (age- and sex-matched) divided into two groups: Diabetic (n=100; all type 2) and Non-diabetic (n=50).

The diabetic subjects were further divided into two groups:

-Type 2 Diabetics with thyroid dysfunctions and Type 2 Diabetics who are euthyroid.

INCLUSION CRITERIA:

Patients with type 2 diabetes mellitus with age ≥ 40 yr were included in the study.

- Diabetic patients who are not known cases of thyroid disease.
- Normal healthy subjects for comparative study

EXCLUSION CRITERIA:

- Age < 40 yr
- Diabetes mellitus other than type 2 i.e. secondary, type 1
- Patients on drugs known to alter thyroid hormonal levels for e.g. Amiodarone, Beta Blockers, Corticosteroids etc. [12]
- Diabetics who are known cases of thyroid disorders.
- Critically ill patients (patients with significant hepatic & renal disease, haematological malignancy, chronic kidney disease, Cerebrovascular accidents, Acute Myocardial Infarction etc.)
- Diabetics with chronic conditions known to alter thyroid function, like hepatic dysfunction, nephrosis etc. [13]
- Pregnant women with diabetes mellitus. [14]

METHODOLOGY:

- All the patients in the diabetic group were confirmed diabetics who were either diagnosed as per ADA criteria or were receiving treatment for diabetes mellitus.
- Fasting blood samples was used to estimate the parameters such as:
- T3, T4 and TSH-estimated by using (CLIA -method) chemi luminescence immune assay method [15]
- Fasting plasma glucose – estimated by using (GOD-POD method) semi auto analyser – COBAS MIRA [16].
- Lipid profile – estimated by using (FLEA-Method) semi auto analyser.

RESULTS:

In this study, 100 established diabetics were screened for thyroid disorders by Thyroid function tests.

In this study we divided the patients in two age groups; < 60 years and

patients over the age of 60 years (elderly). We had 70 people with type 2 diabetes below the age of 60 years and 30 people over the age of 60 years (elderly). The spectrum of thyroid disorders among these groups was as follows – Out of the 70 patients below the age of 60 years 1 had sub- clinical hypothyroidism, 2 had hypothyroidism and 4 of them were hyperthyroid and out of 30 elderly patients (> 60 years) we found 4 with sub- clinical hypothyroidism and 2 had hyperthyroidism. 1 hypothyroid case was noted in elderly people. In this study prevalence of sub-clinical hypothyroidism (13.4%) was more in >60 years age group (elderly patients) compared to 1.4% in < 60 years age group, where as 5.7% below the age of 60 years had hyperthyroidism as compared to that of 6.7% among >60 years age group. Hypothyroidism was present in 2.9% of people below the age of 60 yrs where as 3.4% of the elderly (> 60 years) had hypothyroidism.

In this study we found that all forms of thyroid dysfunctions were more common in elderly as compared to patients below the age of 60 years with type 2 Diabetes

TABLE 1: ANTHROPOMETRIC AND BIOCHEMICAL MEASUREMENTS

Parameters	Type II DM Patients	Normal Controls	P* (value)
AGE	56.47±10.37	56.48±11.22	>0.005
T3	172.6±111.54 umol/L	126.61±36.04 umol/L	<0.005
T4	10.94±7.48 umol/L	8.71±1.46 umol/L	>0.005
TSH	7.47±3.27 nmol/L	2.29± 1.21 nmol/L	<0.005
Plasma Glucose (FPG)	204.285 ± 48.044 mg/dl	148.19 ±28.31 mg/dl	<0.005
TG	212.785 ± 72.854 mg/dl	137.77 ± 40.24 mg/dl	<0.005

P* (value) <0.005 is considered to be statistically significant

Table 1 shows the anthropometric and clinical measurements of diabetic and non-diabetic subjects which includes (mean age 56.47 ± 10.37) years and FPG level in type II DM patients was found to be (170±10)mg/dl which is significantly higher than the control subjects (148.19±28.31)mg/dl. TGL level was found to be (212.78±72.85mg/dl) in type II diabetic patients and (137.77±40.24 mg/dl) in age matched healthy controls.

Serum TSH was significantly increased in type II DM subjects (7.47±3.27 nmol/L) as compared to the non diabetic healthy age matched controls (2.29±1.21 nmol/L)

DISCUSSION:

It was found that there is a significant reduction in the plasma T3 levels and significant increase in TSH levels in DM patients. The thyroid hormones act as an insulin antagonist which potentiates the insulin action indirectly. In DM, the TRH synthesis decreases and this is responsible for the occurrence of low thyroid hormone levels in diabetes. According to the results obtained in this study, type II DM patients were more prone to hypothyroidism frequently. The results of the present study was corroborated with the report of Gujarat singh et al[17], Demitrost et al[18] Valeri Witting et al[19]. This study shows a significant correlation between the thyroid hormones and the blood glucose levels in type II diabetes mellitus patients.

SUMMARY AND CONCLUSION:

From the above studies it was observed that thyroid function levels were altered in DM patients, in particular with T3 and TSH levels and it may be concluded that a regular screening of diabetes mellitus patients for thyroid function studies is recommended to avoid further complications of thyroid dysfunctions.

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