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Assessment of Thyroid Profile in Diabetes Mellitus Patients: A Hospital Based Prospective Study

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Abstract

Background: Diabetes mellitus is a common endocrine disorder and is one of the causes for mortality worldwide. Thyroid dysfunction commonly occurs in diabetic patients. The present study aims to evaluate the thyroid dysfunction in diabetic patients.

Materials and Methods: The study was done in Department of General Medicine, Command Hospital Air force, Bangalore, Karnataka. Total 100 patients were included in this study. All the patients were explained the study procedure. All patients demographic, clinical data was recorded. Blood samples were collected from each patient and used for the estimation of glucose, HbA_1C and thyroid profile. The data was analysed by SPSS (16.0) version.

Results: Maximum patients were in the age group between 41-60 years, Females were compared to males. 16 showed hypothyroid profile and 3 hyperthyroid profile.There were 27 patients who showed positive for antiTPO antibodies. All thyroid disorder patients showed positive for antiTPO antibodies.

Conclusion: The study results conclude that diabetes mellitus patients are more prone to thyroid disorders.

Keywords: Diabetes mellitus, Thyroid gland, Insulin, Glucose, HbA_1C, Thyroid profile

Introduction

There is a growing body of evidence to suggest that diabetes mellitus (DM) patients have a higher prevalence of thyroid disorders compared with the normal population. Patients with DM suffer from a greater risk of cardiovascular diseases and often are in association with other disorders[1,2]. Thyroid dysfunction might contribute to these factors. Many studies have been conducted worldwide and in India to show the association of diabetes mellitus with thyroid abnormalities, but there are very few studies to show the prevalence of thyroid dysfunction in diabetes mellitus patients[3]. It was observed that prevalence of thyroid disorders increases with the duration of DM[4]. Since DM and thyroid disorders are common in the Indian population, this study is being conducted to

assess the prevalence of thyroid dysfunction in diabetes mellitus patients.

Materials and Methods

Study settings and design: The study was done in Department of General Medicine, Command Hospital Air force, Bangalore, Karnataka. It is cross sectional study. The study was approved by Institutional Human Ethics Committee (IHEC).

Inclusion criteria

- Both gender
- Type 2 diabetes mellitus
- Not on thyroid drugs

Exclusion criteria

- Diabetes not more than 20 years
- Pregnant women
- Recent thyroid surgery

Procedure

The study included total of 100 patients on the basis of inclusion and exclusion criteria. All the patients were explained the study procedure and informed consent was obtained. Demographic and clinical data was recorded. Blood samples were collected from each patient and serum was separated. The stored serum was used for the estimation of glucose (Auto analyser), HbA_1C (Auto analyser) and thyroid profile (ELISA) methods[5-7].

Statistical analysis

Statistical Package for Social Sciences (SPSS 16.0) version used for analysis. The data was expressed in number, percentage, mean and standard deviation. Micro soft excel 2010 was used to draw the graphs.

Results

This study included 100 diabetic patients. Maximum number of patients had age between 41-50 years (n=41) followed by 51-60 years (n=25), 15 were above 60 years and 19 were less than 40 years (Table-1). Percentage of female (62.0) was more compared to males (38.0%) (Graph-2). 57.0% of patients had less than 10 years duration of diabetes mellitus (Table-2). 76 patients showed HbA_1C level less than 7 and others showed above 7 (Table-3). In study population 16 showed hypothyroid, 3 hyperthyroid and 81 showed euthyroid profile. Hypothyroidism is more common than hyperthyroidism in diabetic patients (Table-4). 27 showed positive and 73 showed negative for antiTPO antibodies (Graph-2).

Discussion

Diabetes mellitus comprises a heterogeneous group of metabolic disorders that share the phenotype of hyperglycaemia. Several distinct types of DM exists and is caused by complex interaction of genetic, environmental factors and lifestyle choices. Globally the number of people with DM is expected to rise from 250 million in 2010 and 400 million in 2025. An epidemic of type 2 DM is underway in both developed and developing countries. Age and gender also play an important role in development of type 2 DM. Disorders of thyroid gland either hypothyroidism or hyperthyroidism are common in normal population. Especially, subclinical hypothyroidism is 4 to 21% in women and 3-10% in men with more than 10 million people affected in U.S and approximately 43 million in Europe[8]. As per the Colorado thyroid health study conducted in 1995, the incidence of hypothyroidism increases with age. The prevalence of thyroid disease in patients with DM is significantly higher than in the general population i.e. 13.4%, highest in patients with type 1 DM (31.4%) and lowest in patients with type 2 DM (6.8%)[9]. In addition to autoimmune link between DM and thyroid disease, both are found commonly in middle aged individuals further contributing to the high association. In our study, female DM patients

outnumbered the male DM patients (62.0% vs 38.0%). This is akin to many studies that have reported increased prevalence of type 2 DM in females[10,11]. The mean age of the patients in our study was 48.9 years and subjects in the age group 41-60 years constituted around 65.0% of the patients included in our study. Most of the previous studies have found high prevalence of DM in middle aged individuals. In majority of our study subjects (76 out of 100), the HbA_1C values were less than 7.0% with 90% CI 68.35 – 82.28 and the HbA_1C value was not statistically associated with increased incidence of thyroid dysfunction p=0.738. The results of the thyroid function test performed in our study subjects were as follows, 81 patients had euthyroid profile, 16 had hypothyroid profile and remaining 3 patients had hyperthyroid profile. It was also noted that the serum of 27 subjects were positive for antiTPO antibodies, of which 08 were male patients and 19 were female patients. All the patients who had hypothyroid and hyperthyroid profile were positive for antiTPO antibodies (>40.1U/ml). Previous studies showed that DM patients have more levels of antiTPO antibodies than normal patients. The present study results proved that thyroid dysfunction is more common in DM patients and it should be treated as early as possible to reduce the mortality and morbidity.

Conclusion

The study evaluated the thyroid profile in diabetic patients. It was concluded that patients with diabetes mellitus are prone to develop thyroid dysfunction. Early diagnosis and initiation of medications can prevent the disease progression and mortality.

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Table 1: Distribution of patients based on the age (Years)

Age (years)	Number(n=100)	Percentage (%)
31-40 Y	19	19.00
41-50 Y	41	41.00
51-60 Y	25	25.00
61-70 Y	15	15.00

Graph 1: Distribution of patients based on the gender

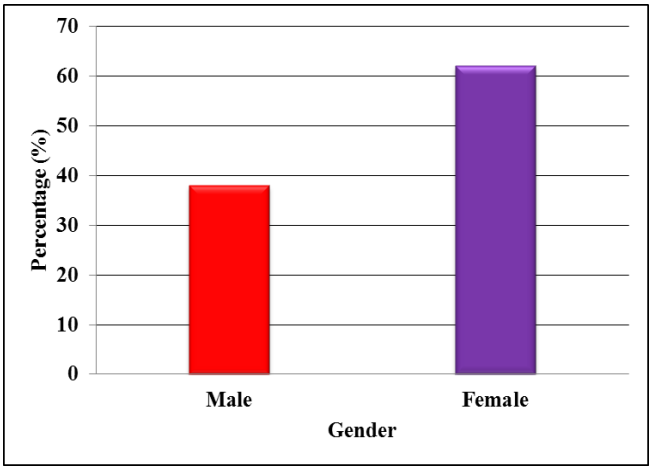

Table 2: Distribution of patients based on the duration of diabetes

Duration of diabetes mellitus (Years)	Number (n=100)	Percentage (%)
<10 years	57	57.00
>10 years	43	43.00

Table 3: Distribution of patients based on the HbA_1C levels

HbA_1C (%)	Number (n=100)	Percentage (%)
<7	76	76.00
>7	24	24.00

Table 4: Distribution of patients based on the thyroid profile

Thyroid profile	Number (n=100)	Percentage (%)
Euthyroid	81	81.00
Hyper thyroidism	3	3.00
Hypo thyroidim	16	16.00

Graph 2: Distribution patients based o AntiTPO antibodies