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Research Article

STUDY TO KNOW THE PREVALENCE OF THYROID DYSFUNCTION IN PATIENTS OF DIABETES MELLITUS

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Abstract:

Objective: To know the thyroid disease prevalence and its association with diabetic complications in diabetic patients.

Study design: A descriptive study.

Place and Duration: In Jinnah Hospital Lahore for one year duration from September 2017 to September 2018.

Methods: The study included 100 patients with diabetes mellitus (DM) aged over 12 years of age. All diabetics were tested for TFTS including T3, T4 and TSH. A detailed examination and clinical history was performed to determine the signs and symptoms of thyroid dysfunction and its relation with DM complications. Other examinations were: CBC, blood glucose level (BSF and 2 hours postpartum), urinalysis, HbA1C, ECG, chest X-ray, blood urea, serum creatinine, fasting lipid profile and liver function tests. Echocardiography was performed when urinary ketones, Doppler studies, serum electrolytes and arterial blood gas analysis were reported for peripheral vascular disease. The data were analyzed using SPSS 18 and the in terms of descriptive statistics results were recorded. The percentage and frequency were checked and the standard deviation was determined. The $p < 0.05$ was static significant.

Results: In the study 100 total patients were selected. The male were 51% and female were 49%. The 16 to 70 years was the age range (mean, 55 years). 13% had type 1 DM, 87% had type 2 DM and 14% had thyroid dysfunction. The subclinical hypothyroidism was noted in 5 of them, hypothyroidism in 4 patients, hyperthyroidism in 3 and subclinical hyperthyroidism in 2. The thyroid dysfunction prevalence in diabetic patients; complication was 14.4% of those with ischemic heart disease, 12.8% with neuropathy, 13% with peripheral vascular disease, 16% with retinopathy, 12.7% with nephropathy and 9% with hypoglycemia and diabetic foot 33.3%.

Conclusion: In diabetic patients; Thyroid dysfunction is common and can make significant metabolic changes.

Key words: Hyperthyroidism, diabetes mellitus, hypothyroidism.

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INTRODUCTION:

In clinical practice, the diabetes mellitus (DM) and Thyroid diseases are more common endocrine disorders. Both disease effect each other and the association between the two conditions have been reported for a long time. On the one hand, thyroid functions are affected by diabetes mellitus while carbohydrate metabolism is regulated by thyroid hormones. This clinical association cannot be explained by the excess or scarcity of any hormones. Many studies have shown that there is an genetic and immunological relationship between the 2types of disorders. DM is mostly associated with other autoimmune diseases; among these, the most common are thyroid diseases. The purpose of this analysis was to evaluate the thyroid disease prevalence in diabetic patients; this will help physicians to guide doctors in optimal detection and treatment of these problems and conditions.

MATERIALS AND METHODS:

The study was conducted in Jinnah Hospital Lahore for one year duration from September 2017 to September 2018. The study included hundred patients of either sex or age of twelve years or older suffering from thyroid dysfunction and diabetes mellitus (DM). The patients diagnosed with DM were sub grouped in Type I and Type II according to criteria defined by WHO. All patients of diabetes mellitus were tested

for functions of thyroid gland including TSH, T3 and T4. The thyroid levels were checked by the RIA method on an automatic analyzer. By IRMA method; TSH was recorded. A detailed examination and clinical history was performed to determine the signs and symptoms of thyroid dysfunction and DM and their complications. Other examinations were: CBC, blood glucose level (BSF and 2 hours postpartum), urinalysis, HbA1C, ECG, chest X-ray, blood urea, serum creatinine, fasting lipid profile and liver function tests. Echocardiography was performed when urinary ketones, Doppler studies, serum electrolytes and arterial blood gas analysis were reported for peripheral vascular disease. With SPSS 18.0; the data was analyzed and the results were defined as descriptive statistics. The percentage and frequency were checked and the standard deviation was determined. Significance was kept at $p < 0.05$.

RESULTS:

100 diabetic patients who were admitted to the medical department were included in this study. 51% were male and 49% were female. The 16 to 70 years was the age range (mean, 55 years). 13% had type 1 DM, 87% had type 2 DM and 14% had thyroid dysfunction. The subclinical hypothyroidism was noted in 5 of them, hypothyroidism in 4 patients, hyperthyroidism in 3 and subclinical hyperthyroidism in 2. (Table 1).

Table 1: Correlation of various thyroid disorders to the subtypes of DM

| Type of thyroid disease | Type 1 CM | Type 2 DM | Total |
|-----------------------------|-----------|-----------|-------|
| Hypothyroidism | 1 | 3 | 4 |
| Subclinical hypothyroidism | 0 | 5 | 5 |
| Hyperthyroidism | 2 | 1 | 3 |
| Subclinical hyperthyroidism | 1 | 1 | 2 |
| Total | 4 | 10 | 14 |

In patients with thyroid dysfunction; diabetic complications are shown in Table 2.

Table 2: Prevalence of diabetic complications in various types of thyroid dysfunctions

| Diabetic Complication | Hypothyroidism | Subclinical hypothyroidism | Hyperthyroidism | Subclinical hyperthyroidism |
|-----------------------|----------------|----------------------------|-----------------|-----------------------------|
| IHD | | | | |
| Stable angina | 1 | 2 | 1 | 1 |
| Unstable angina | 1 | 2 | 0 | 0 |
| MI | 2 | 1 | 0 | 0 |
| PVD | 3 | 3 | 0 | 0 |
| Neuropathy | 3 | 5 | 2 | 1 |
| Retinopathy | | | | |
| Background | 2 | 1 | 0 | 1 |
| Preproliferated | 1 | 0 | 1 | 0 |
| Proliferated | 0 | 1 | 0 | 0 |
| Vitreous he | 0 | 1 | 0 | 0 |
| Nephropathy | 2 | 1 | 0 | 0 |
| CRF | 0 | 2 | 1 | 0 |
| Hypoglycemia | 0 | 2 | 0 | 0 |
| Diabetic foot | 1 | 1 | 0 | 0 |
| DKA | 0 | 0 | 2 | 0 |

The thyroid dysfunction prevalence in diabetic patients; complication was 14.4% of those with ischemic heart disease, 12.8% with neuropathy, 13% with peripheral vascular disease, 16% with retinopathy, 12.7% with nephropathy and 9% with hypoglycemia and diabetic foot 33.3%.

DISCUSSION:

Several reports suggest that the normal thyroid dysfunction prevalence is higher in the diabetes mellitus patients. Our study analysed that 14% of diabetics suffering from thyroid diseases were similar to other analysis. We noticed that 13% of patients of DM type 1 were between 15 and 40 years of age in our study,. The remaining were from type 2 DM group and in patients with type 1 diabetes thyroid diseases were more common than with type II diabetic patients and 30.7% of patients with type I diabetes mellitus had dysfunction of thyroid gland. In type 2 DM patients; 11.5% of patients had thyroid disease. Other studies have shown that thyroid disorders are the most common autoimmune disorders linked with type I diabetes with autoimmune thyroiditis. In 13 patients with type 1 DM, 1 (7.6%) had open hypothyroidism and 3 (23%) had marked / subclinical hyperthyroidism. With type II DM in 87 patients, subclinical hypothyroidism was noted in 8 (9.2%) and two had subclinical hyperthyroidism. We suggested that both prominent and subclinical thyroid hypofunction is the most common type of disease. Both clinical and

subclinical hypothyroidism showed maximum microvascular and macrovascular issues, including peripheral vascular disease, nephropathy and coronary artery disease. On the other hand, diabetic ketoacidosis was characteristic of underlying hyperthyroidism in type 2 DM patients. In addition, at the other end of the spectrum, advanced analysis with subjects from the population of China supposed that subclinical hypothyroidism may be a risk factor for the metabolic syndrome. By Singer, Hollander and Yang et al, It has been shown that the risk of nephropathy and retinopathy is increased in patients with subclinical hypothyroidism.

CONCLUSION:

In diabetic patients; Thyroid dysfunction is common and can make significant metabolic changes. Therefore, regular thyroid abnormalities detection in all patients of diabetes mellitus will help timely subclinical thyroid dysfunction treatment.

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