

FREQUENCY OF UNDIAGNOSED THYROID DISORDERS IN PATIENTS WITH TYPE 2 DIABETES MELLITUS AT A TERTIARY CARE CENTER

Rab Nawaz Khan¹, Raza Ullah², Ibrar Ahmad³, Tahir Ghaffar⁴

^{1,2} Department of Endocrinology, Hayatabad Medical Complex, Peshawar – Pakistan.

^{3,4} Department of Endocrinology, Lady Reading Hospital, Peshawar – Pakistan.

Address for Correspondence:
Dr. Ibrar Ahmad

Assistant Professor,
Department of Endocrinology,
Lady Reading Hospital, Peshawar – Pakistan.

Email: ibrar2127@hotmail.com.

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ABSTRACT

Objective: To find out the frequency of undiagnosed thyroid disorders in patients with type 2 diabetes mellitus.

Methodology: It was a descriptive study. One hundred and forty-two patients with age 20 years and above and of either gender who were diagnosed cases of type 2 diabetes were included in study from the outpatient department (OPD) of Hayatabad Medical Complex, Peshawar. Frequency of undiagnosed thyroid disorders was determined. Thyroid disorders were classified as clinical hyperthyroidism, subclinical hyperthyroidism, clinical hypothyroidism and subclinical hypothyroidism.

Results: Out of 142 patients, there were 78 (54.9%) females and 64 (45.1%) males. Overall undiagnosed thyroid disorders in type 2 diabetic patients were 18.3%. Subclinical hypothyroidism was 8.5%, clinical hypothyroidism was 4.9%, subclinical hyperthyroidism was 3.5% and clinical hyperthyroidism was found in 1.4% of type 2 diabetic patients.

Conclusion: A high proportion of type 2 diabetic patients had undiagnosed thyroid disorders and Subclinical hypothyroidism was the most frequent thyroid disorder.

Key Words: Diabetes mellitus, Thyroid disorders, Subclinical hypothyroidism, Subclinical hyperthyroidism

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INTRODUCTION

Diabetes and thyroid disorders are the two most common diseases of endocrine system¹. Both can affect quality of life and have poor outcomes when present in the same patient². The association of two conditions was first described by Colleen et al³ in 1927 and it was reported that thyroid disorders worsen diabetes control. Several studies have been done in different countries to find out the association of thyroid disorders in type 2 diabetes. In general population, thyroid disorders range from 6.6% to 13.4%⁴. In diabetics, the prevalence of thyroid disorders varies from 10 to 24%⁴. These variations may be due to variation of iodine intake in different regions, sensitivity of TSH assays and diversities in population. Most of the diabetic patients who have thyroid dysfunction are asymptomatic⁵, therefore screening is necessary for early diagnosis and timely treatment. There was no regional study regarding unrecognized thyroid disorders in type 2 diabetic patients. The aim of this study was to find out the frequency of undiagnosed thyroid disorders in type 2 diabetic patients. This study

will provide the base line data for future studies. This study will alert the health care personnel to have high index of suspicion for thyroid disorders in type 2 diabetic patients and treat them timely.

METHODOLOGY

It was a descriptive study. Total number of patients were 142, who attended Endocrine Out Patient Department (OPD) of Hayatabad Medical Complex. Informed written consent was taken from each patient. All the patients with age 20 years and above and of either gender who were diagnosed cases of type 2 diabetes were included in study. Exclusion criteria were all those patients who were already diagnosed with thyroid disorders and those patients who had type 1 diabetes, patients on amiodarone therapy, history of intake of iodine or recent history of hospitalization or acute illness (sick euthyroid patients) were excluded from study.

Thyroid disorders were classified as clinical hypothyroidism, subclinical hypothyroidism, clinical hyperthyroidism and subclinical hyperthyroidism. These

were operationally defined as: clinical hyperthyroidism in which there were raised free T4 (more than 1.7 microgram/dl) and T3 (more than 2 nanogram/dl) with suppressed TSH (less than 0.3 micro IU/ml); Subclinical hyperthyroidism, normal freeT4 (0.93-1.7 microgram/dl) and T3 (0.8-2 nanogram/dl) with suppressed TSH (less than 0.3 micro IU/ml); clinical hypothyroidism, increase TSH (more than 4.2 micro IU/ml) and decreased free T4 (less than 0.93 microgram/dl) and T3 (less than 0.8 nanogram/dl); and subclinical hypothyroidism in which there were increased TSH (more than 4.2 micro IU/ml) and normal T4 (0.93-1.7 microgram/dl) and T3 (0.8-2 nanogram/dl).

Thyroid function tests were advised in all patients. Thyroid function tests were done on Cobos 6000 machine (Roche) and electro-chem-illuminescence immunoassay method was used. Patients' bio data and thyroid function tests were documented on preformed proforma. After data collection, all the data were entered and analyzed using SPSS version 20. Age, gender, thyroid status of patients and demographic variables were analyzed. Categorical variables were described as frequency (percentage). Continuous variables were analyzed as mean and standard deviation. P value of <0.05 was considered as statistically significant.

RESULTS

Out of 142 patients, there were 78 (54.9%) females and 64 (45.1%) males. Most of the patients (n=78, 54.9%) belonged to the age group of 41-60 years. Age groups of the patients are shown in Table 1.

Patients residing in hilly areas constituted 66 (46.5%) while those residing in plain areas were 76 (53.5%).

Among the 142 included patients, 26 (18.3%) of patients, who were previously not aware, that they have thyroid disorders, were diagnosed to have thyroid disorders. Subclinical hypothyroidism was the most frequent thyroid disorder and diagnosed in 12 (8.5%) patients, followed by clinical hypothyroidism in 7 (4.9%) of type 2 diabetic patients. Thyroid status of the patients is shown in Table 2.

DISCUSSION

In this study the frequency of all types of undiagnosed thyroid disorders was 18.3%. Subclinical hypothyroidism was the most common thyroid disorder present in type 2 diabetic patients which was 8.5% in our study. Though a clear reason was not found for its occurrence in our study but most of the subclinical hypothyroidism patients were obese and hence prone to type 2 diabetes. Similar findings were also found in a Greek study done by Papazafiropoulou et al⁶. They found that the prevalence of thyroid dysfunction was 12.3% in their population. Another study done in Out Patient Department of Royal infirmary hospital, Edinburgh in which prevalence of thyroid dysfunction was found to be 6.8%⁷. A community based study done in Australia by Chubb et al⁸ found prevalence of thyroid disorders as 8.6%. Thyroid disorders were found risk factors for diabetic nephropathy and increased cardiovascular events in type 2 diabetes as reported by Chen et al⁹. Other studies have shown that prevalence of thyroid disorders were less common in general population as compared to diabetic population^{10,11}.

Studies have shown that increase level of thyroid hormones in the serum increases apoptosis of beta cells

Table 1: Age of study patients (n=142)

Age Groups (years)	Frequency	Percentage
20-40	48	33.8
41-60	78	54.9
More than 60	16	11.3
Total	142	100

Table 2: Thyroid status of patients (n=142)

Thyroid Status	Frequency	Percentage
Subclinical Hypothyroidism	12	8.5
Clinical Hypothyroidism	7	4.9
Subclinical Hyperthyroidism	5	3.5
Clinical Hyperthyroidism	2	1.4
Euthyroid	116	81.7
Total	142	100

of pancreas and this may be responsible for poor glycemic control in these patients^{12,13}. Thyroid hormones act differently in adipose tissue, skeletal muscles and in liver and oppose the action of insulin in these target organs^{14,15}. This may be the possible reason for poor glycemic control in these patients. Similarly decrease glucose disposal in hypothyroid patients have been described in few studies^{16,17}. So both subclinical hypothyroidism and hyperthyroidism have been linked to increase cardiovascular risk¹⁸.

The percentage of undiagnosed thyroid disorders seems to be much more common in Pakistani population. The study done by Akhtar et al¹⁹ showed that 55.1% of type 2 diabetic patients had thyroid disorders. It is therefore recommended that diabetic patients need to be screened for thyroid disorders.

LIMITATIONS

There are some limitations of our study. We collected data from one hospital and the sample size was also small so we can't generalize this study for whole population of Khyber Pakhtunkhwa or Pakistan. Multi centers, large scale study is needed to find out exact prevalence of thyroid disorders in Pakistani Population.

CONCLUSION

A high proportion of type 2 diabetic patients had undiagnosed thyroid disorders and Subclinical hypothyroidism was the most frequent thyroid disorder. Type 2 diabetic patients need to be screened routinely for thyroid disorders.

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CONTRIBUTORS

RNK conceived the idea, planned the study, and drafted the manuscript. RU helped acquisition of data and did statistical analysis. IA and TG did literature search, drafted and critically revised the manuscript. All authors contributed significantly to the submitted manuscript