



## PREVALENCE OF THYROID DYSFUNCTION IN TYPE 2 DIABETES

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**ABSTRACT** Diabetes mellitus is the most common disorder. Over the years it has been evident that there exists a strong relation between thyroid and diabetes. Deficiency or excess of the thyroid hormones are believed to alter the functional integrity of insulin.

**Aim:** To establish the prevalence of thyroid dysfunction in type 2 diabetes mellitus. To know the spectrum of thyroid dysfunction in type 2 diabetes mellitus.

**Materials and Method :** Patients who were diagnosed with Diabetes mellitus admitted into the medical ward of RL JALAPPA HOSPITAL, KOLAR from June 2016 to December 2016.

**Results:** A total of 130 cases of type 2 DM studied showed thyroid dysfunction among 29%. Subclinical hypothyroidism was most common (15%) of thyroid disorders. Complications were noted more in subclinical hypothyroidism

**KEYWORDS :** subclinical hypothyroidism, type 2 diabetes

### INTRODUCTION

Among all the endocrinal metabolic diseases, Diabetes mellitus is the most common disorder. The impact of this disease on quality of life, and on morbidity and mortality through its complications affecting small and large vessels resulting in retinopathy nephropathy, neuropathy, IHD, and large vessel obstruction.

The largest endocrine gland in the body is the thyroid gland, thyroxine(T4) is the primary hormone secreted and triiodothyronine (T3) is secreted in lesser amounts. These play an important role in maintaining the metabolism in the tissues that is required for their normal function. Thyroid hormone helps in stimulating O<sub>2</sub> consumption in the body, it helps to regulate carbohydrate and lipid metabolism.<sup>1</sup>

Over the years it has been evident that there exists a strong relation between thyroid and diabetes. The incidence of thyroid illnesses differs in different diabetic population. Thyroid through its hormones exert a great influence on various organs in the body. Likewise insulin also plays a major role in various cellular metabolic activities. Hence a deficiency or excess of the thyroid hormones are believed to alter the functional integrity of insulin. Enhanced sensitivity and specificity of TSH has greatly enhanced assessment of thyroid functions.<sup>2</sup>

Thyroid hormones directly control insulin secretion. In hypothyroidism, there is a reduction in glucose-induced insulin secretion by beta cells, and the response of beta cells to glucose or catecholamine is increased in hyperthyroidism due to increased beta cell mass. Moreover, insulin clearance is increased in thyrotoxicosis.<sup>3,4</sup>

Uncontrolled blood sugars alter the plasma levels of both T3 and T4 thereby causing derangement in the thyroid metabolism<sup>5</sup>. Reverse effects have been observed in patients with hypothyroid metabolism<sup>6</sup>.

The presence of undiagnosed hypothyroidism may increase cardiovascular risk by aggravating dyslipidemia, insulin resistance, obesity and vascular endothelial dysfunction<sup>7,8</sup>.

### AIMS AND OBJECTIVES:

- To establish the prevalence of thyroid dysfunction in type 2 diabetes mellitus.
- To know the spectrum of thyroid dysfunction in type 2 diabetes

### MATERIALS & METHODS:

All type 2 diabetic patients without previous history of thyroid

dysfunction or pregnancy who presented to R L Jalappa Hospital, kolar were included in the study. A written informed consent was taken from the patient. A detailed history and clinical examination as per the proforma. Thyroid function tests done by chemiluminescence method. Estimation of the levels of T3, T4 & TSH, FBS, PPBS, HbA1c. Data was entered into Microsoft excel data sheet and was analysed using SPSS 22 version software. Independent test were used as test of significance to identify the mean difference between two groups i.e. group with p wave changes and group without p wave changes. p value <0.05 was considered as statistically significant.

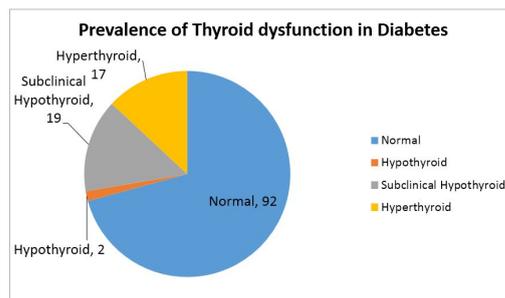
### RESULTS

In this study, 130 established diabetics were screened for Thyroid disorders by TFT. Abnormal thyroid function was found in 38 type 2 DM cases and remaining diabetics had normal thyroid function. Among 38 cases low thyroid function was noted in 21 patients and 17 subjects had hyper functioning of thyroid gland. Out of 21 Hypothyroid subjects 2 had overt hypothyroidism and 19 had Subclinical hypothyroidism. (Fig 1)

**Table 1:**

Thyroid disorders	Number of cases
Normal	92 (71%)
Hypothyroidism	2 (1%)
Subclinical hypothyroidism	19 (15%)
Hyperthyroidism	17 (13%)

**Fig 1:**



In the present study of 130 patients with type 2 Diabetes, 65 were males

and 65 were females. We have found that prevalence of thyroid dysfunction was more among females than in males. 14 (21.52%) out of 65 male patients had thyroid dysfunction where as 24 (36.83%) out of 65 females were suffering from thyroid disorders ( p - value for incidence of subclinical hypothyroidism in males and females was found to be 0.05 by using Mann - Whitney Test, which is significant and non-significant in case of hypothyroidism and hyperthyroidism incidence in both males and females)

**Thyroid dysfunction in relation to duration of Diabetes**

130 diabetics in this study were divided into three groups according to the duration of diabetes.

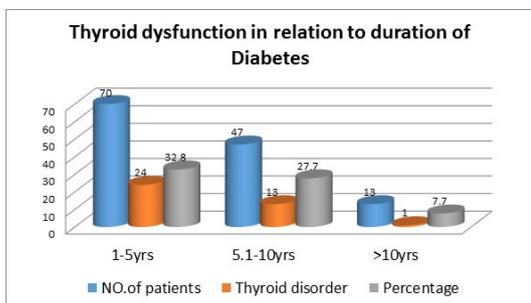
70 people were in the duration of 1-5 yrs and 47 were in the 5.1-10 yrs and the remaining 13 had more than 10 yrs duration of diabetes (table 2)

**Table 2:**

Duration of DM	No. of patients	Thyroid disorder	%
1-5yrs	70	24	32.8%
5.1-10yrs	47	13	27.7%
>10yrs	13	1	7.7%

In this study, incidence of thyroid disorder with duration of diabetes was found to have a p - value of > 0.05 by using Kruskal - Wallis Test, which is non-significant.(fig:2)

**Fig:2**



In this study, out of 130 patients with type 2 diabetes, 43 patients had complications of diabetes in the form of retinopathy, nephropathy, and neuropathy based on clinical and laboratory evidences. 16 out of 43 had thyroid disorders( table 3)

**Table 3: Thyroid dysfunction in relation to complications of Diabetes**

	Total No of patients	Patients with Thyroid Disease	%
DM with complications	43	16	27.9%
DM without complications	87	22	36.1%

In this study, thyroid dysfunction in relation to complications of diabetes is found to have a p- value of > 0.05 by using Mann - Whitney Test which is non-significant.

Out of 43 patients with complications retinopathy was present in 14, nephropathy in 22, neuropathy in 20

Out of 14 patients with retinopathy 5 had thyroid disorders of which 4 had Subclinical hypothyroidism, 1 had Hyperthyroidism. Out of 22 patients with nephropathy 6 had Thyroid disorder of which 5 had Subclinical hypothyroidism, 1 had Hyperthyroidism. Out of 20 patients with neuropathy 5 had thyroid disorder of which 3 had Subclinical hypothyroidism, 2 had Hyperthyroidism.(table 4)

**Table 4:Thyroid dysfunction in relation to complications of Diabetes**

DM complications	Total No of patients	Patients with Thyroid Disease
Retinopathy	14	5
Nephropathy	22	6
Neuropathy	20	5

**DISCUSSION**

Diabetes is the most common endocrine disorder. A large number of Indian population suffering from diabetes mellitus and its complications. The disease is responsible for significant mortality and morbidity due to the complications<sup>8</sup>.

This study was conducted at RL JALAPPA Hospital. 130 type 2 diabetic patients were studied.

**Prevalence and spectrum of thyroid disorders in type 2 diabetics**

Of the 130 patients with type 2 diabetes studied, 29% of the patients were found to have thyroid dysfunction. Similar studies have also shown higher prevalence of thyroid dysfunction.

A study conducted by Pasupathi et al showed thyroid dysfunction in 45% of patients with type2 diabetes of which 28% showed hypothyroidism and 17% showed hyperthyroidism.<sup>9</sup>

C.E.J.Udiong<sup>10</sup> in this study from Nigeria found that prevalence of thyroid disorder was 46.5%. Hypothyroidism was present in 26.6% and 19.9%had hyperthyroidism.

Similar studies conducted at Greece, Saudi and Jordan also showed higher prevalence of thyroid dysfunction, which was 12.3%, 16% and 12.5% respectively<sup>11</sup>.

A study conducted by Perros et al showed 13.4% of diabetic patients to have thyroid dysfunction, of which highest prevalence was seen in type 1 diabetics(31.4%) compared to type2 diabetics (6.9%).

In this study out of the 38 patients with thyroid dysfunction ,2 had overt hypothyroidism and 19 had Subclinical hypothyroidism, and remaining 17 had hyperthyroidism.

**CONCLUSION**

1. Prevalence of thyroid dysfunction was seen in 29% of Diabetics studied.
2. Subclinical hypothyroidism was more common than other thyroid dysfunctions, which constituted 15% of the thyroid dysfunction in diabetics.
3. Elderly patients had higher incidence (35.62%)of thyroid dysfunction.
4. Thyroid disorders are more in females(36.83%) than males (21.52%).

**REFERENCES:**

1. Barrett KE, Barman SM, Boitano S, Brooks H. Chapter 19. The Thyroid Gland. In Barrett K, editor. Ganong's Review of Medical Physiology. 24th ed. New York: McGraw-Hill Medical; 2012. p. 339.
2. Stanicka S,Vondra K, Pelikanova T,Vieck P,Hill M, Zamarzil V. Insulin sensitivity and counter regulatory hormones in hypothyroidism and during thyroid hormone replacement therapy. Clinical chemistry and Laboratory medicine. 2005; 43(7): p. 715-20.
3. O'Meara NM, Blackman JD, Sturis J, Polonsky KS. Alterations in kinetics of C-peptide and insulin secretion in hyperthyroidism. J Clin Endocrinol Metab. 1993 Jan; 76(1): p. 79-84.
4. Brenta G. Diabetes and thyroid disorders. Br J Diabetes Vasc Dis. 2010; 10: p. 172.
5. Duntas LH, Orgiazzi J, Brabant G. The interface between thyroid and diabetes mellitus. Clin Endocrinol. 2011 Jul; 75(1): p. 1-9.
6. Elredisi MS, Alshanti MS, Shah MF, Brolosy B, Jaha N. Overview of the diagnosis and management of diabetic ketoacidosis. Am J Med Sci. 2006 May; 331(5): p. 243-51.
7. Dimitriadis G, Mitrou P, Lambadiari V, et al. Insulin-stimulated rates of glucose uptake in muscle in hyperthyroidism: the importance of blood flow. Journal of Clinical Endocrinology and Metabolism
8. Ali H, Anwar M, Ahmed T,Chand N. Diabetes mellitus from antiquity to present scenario and contribution of Greco-Arab physicians. JISHIM. 2006; 5: p. 46-50.
9. palanisamy pasupathi,et al. Screeing for thyroid dysfunction in the diabetic/non-diabetic population. Thyroid science. 2008 July; 3(8): p. CLS1-6.
10. Udiong C. E.J, Udoh A E , Etukudoh M E. Evaluation of thyroid function in diabetes mellitus in calabar,Nigeria. Indian Journal of Clinical Biochemistry. 2007 Sep; 22(2): p. 74-8.
11. Radaideh AR, Nusier MK, Amari FL, Bateiha AE, El-Khateeb MS, Naser AS, et al. Thyroid dysfunction in patients with type 2 diabetes mellitus in Jordan. Saudi Medical Journal. 2004 Aug; 25(8): p. 1046-50.