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Study of Incidence of Hypothyroidism in Type-Ii Diabetes Mellitus

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Abstract:
Objective*: Mostly Diabetes & Hypothyroid are the two major endocrine disorders which influence each other and tend to coexist. The objective of the present study is to assess the prevalence of thyroid dysfunction among Type-2 diabetics.*
Materials & methods*: The present study carried was carried out in 100 known cases of Diabetes mellitus attending to medical OP department of GGH. Ananthapur medical college.Ananthapur, A.P,were screened for Thyroid dysfunction by doing Thyroid profile.*
Results: *It was confirmed that 11 cases of hypothyroidism among 100 diabetic patients which is a significant association.*
Conclusion: *When these two endocrinopathies coexist the patients are more prone for cardiac complications. So it is advised to screen every diabetic patient for the occurrence of hypothyroidism.*
Keywords*: Diabetes mellitus, Hypothyroidism.*

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I. Introduction:

Thyroid hormones play a critical role in cell differentiation and metabolic homeostasis in adults, decreased levels ofT3,T4 Hormones results in hypothyroidism(1).In Hypothyroidism overall metabolic processes are deranged.

Subclinical Hypothyroidism: Subclinical hypothyroidism refers to the biochemical evidence of thyroid hormone deficiency in patients who have few are no apparent clinical features of Hypothyroidism. Diabetes mellitus and Hypothyroidism are most common endocrine disorders.

Thyroid hormones have regulatory role over the pancreatic function and the carbohydrate metabolism. Diabetes affects the normal thyroid function. Both the hormones closely involved in cellular metabolism, abnormal levels of one hormone effect the functioning of other hormone (2).

The association between Diabetes and Hypothyroidism was established in first study which is published in 1979(3).In patients with Diabetes glycaemic status influences the releasing mechanism of Thyroid hormones. In poorly controlled Diabetics low T3 state because of impaired TSR response to TRH .Loss of normal nocturnal TSH peak (4,5).Good glycaemic control may normalise the TSR response and low T3 state.

Patients with one organ specific auto immune disease have increased risk to develop other organ auto immune disorders.Hence Diabetics have higher prevalence of Thyroid disorders when compared to normal people.

The most common type of thyroid disorder in Type2 diabetes is subclinical Hypothyroidism (6).Type2 Diabetic people with advanced age are more prone to develop Thyroid disorders. Hypothyroidism causes hyperlipidaemia which is a risk factor for cardiovascular morbidity and mortality(7).Prevalence of Hypothyroidism in India is around 11%(8).The WHO evaluation of Diabetes incidence for all age groups world wise was 2.8% in 2000,4.4% in2030(9).The prevalence of thyroid dysfunction among Diabetic patients has been shown to be varying from 2.2 to17%(10).

The National health and nutrition examination survey study show high prevalence of Hypothyroidism of 3.7% (11).

Various studies have reported the low prevalence of Thyroid dysfunction among Diabetic patients(2.2-17%) in their respective population(7,11).How ever few studies have shown higher prevalence of Thyroid dysfunction in Diabetes i.e, 31-46.5%(12,13).

Hyperglycaemia causes reversible reduction of the activity and hepatic concentration of T4-5 Deiodinase, low serum T3, increase in reverse T3 and also variation of T4 levels(14).

The present study was conducted in order to assess the prevalence of Hypothyroidism in Type2 DM.

II. Materials And Methods:

The present study was conducted in the department of medicine GGH, Govt. Medical CollegeAnantapur, A.P, over a period of One year i.e., from January 2018 to December 2018. A screened population of 100 patients of Type2 Diabetes mellitus with age group of 35-70yrs were selected as diagnosed by ADA criteria were studied .Demographic parameters (duration of Diabetes, anthropometric measurements, and B.P were recorded. History of addictions, smoking, alcoholism and co-morbidities also noted. The laboratory data was collected from the patients including HbA1C, fasting plasma glucose, 2hr post prandial blood glucose, Lipid profile, serum renal function tests, T3, T4, and TSH were estimated simultaneously. Plasma glucose was estimated by GOD-POD method, Lipid profile, serum creatinine,HbA1C were estimated using Autoanalyser.T3,T4,TSH were measured by doing Chemiilluminometric Assay(CLIA) after taking serum of the subjects. Proper consent was taken before doing all the tests.

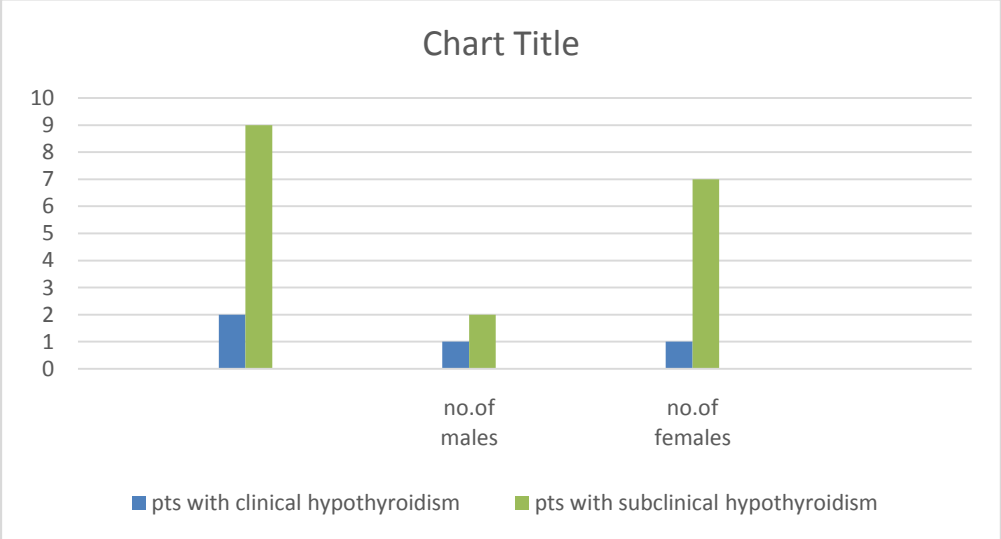
Type1 Diabetes, Diabetic nephropathy, known history of thyroid disorders, acutely ill patients were excluded from the study.

Normal values of T3- 0.52-1.98ng/ml
T4- 0.89-1.76ng/dl
TSH-0.4-5µIU/ml

III. Results

Among 100 Type2 Diabetic patients studied 11 were having Thyroid dysfunction. All of the 11 individuals with Thyroid disorders are in hypothyroidstate.Out of these 11 subjects 2 were males, 9 were females.

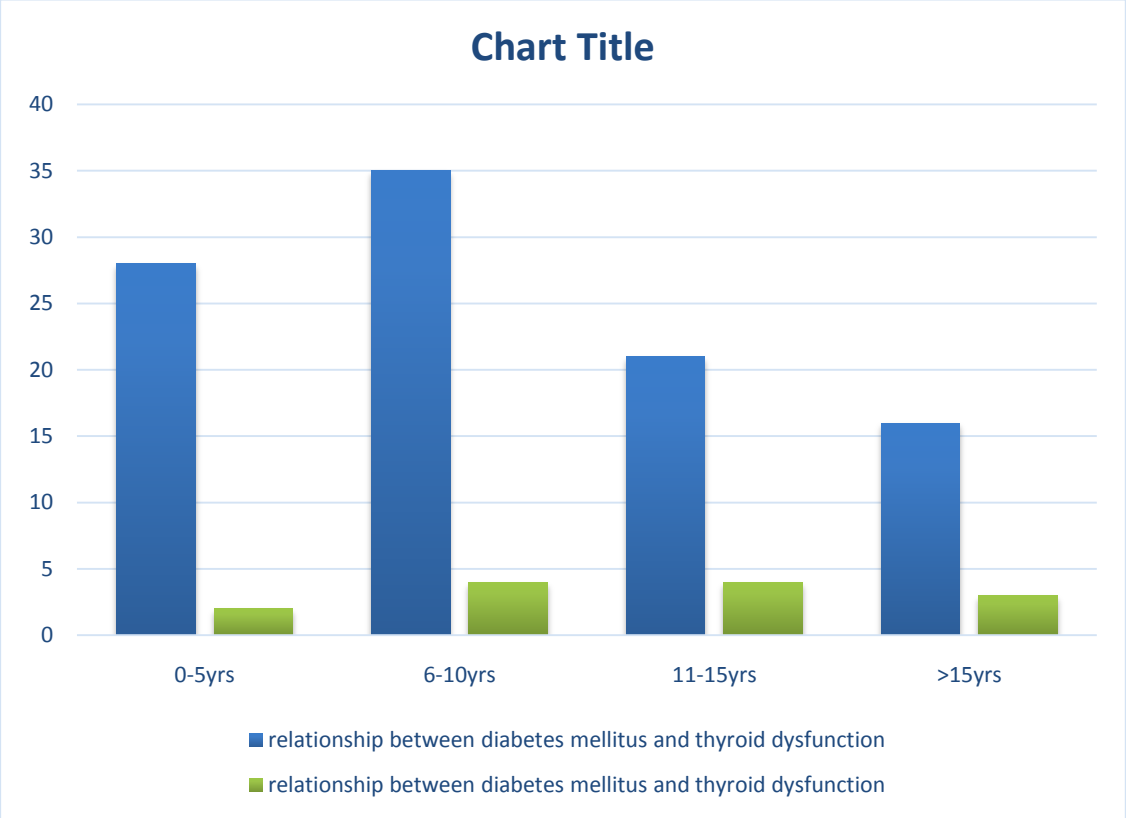
	No of hypothyroid patients	No of males	No of Females
Clinical hypothyroidism	2(2%)	1(1%)	1(1%)
Sub clinical hypothyroidism	9(9%)	2(2%)	7(7%)



Out of 11 Hypothyroid individuals 2 had clinical Hypothyroidism, where TSH increased and T3 ,T4 decreased. These patients are having clinical symptoms of Hypothyroidism. Out of 9, 7 patients are having subclinical hypothyroidism, in those patients increased levels of TSH but normal levels of T3,T4& these patients are not showing any clinical symptoms of hypothyroidism.

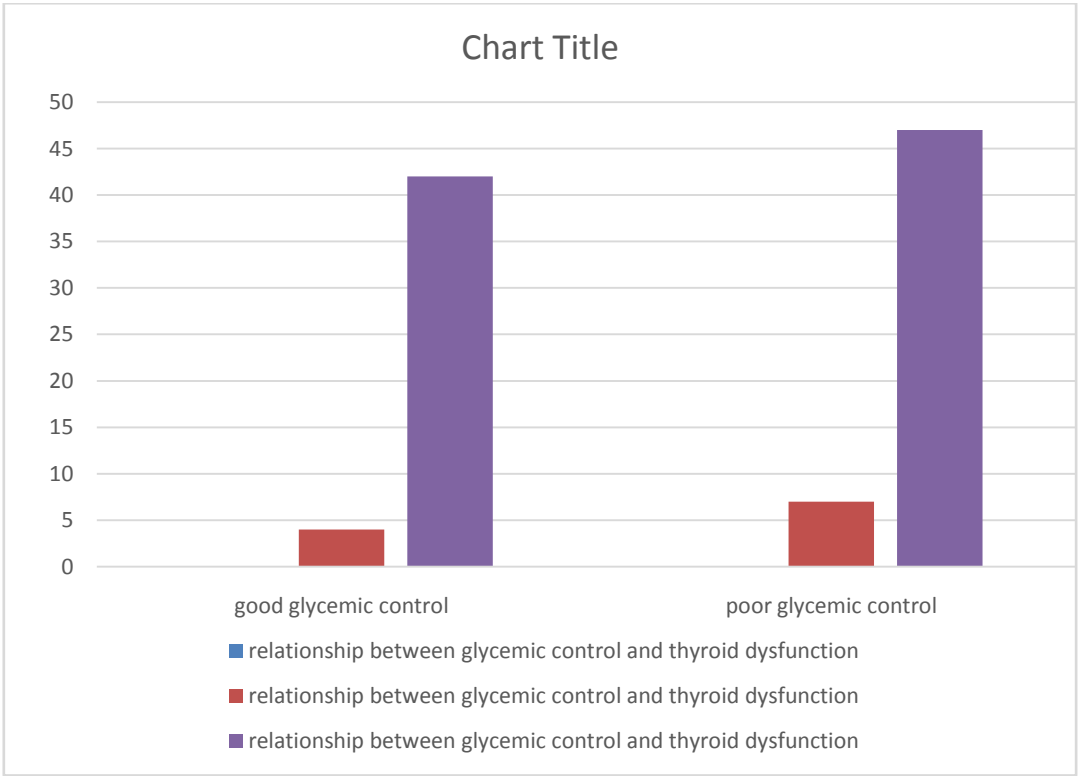
Relation between duration of Diabetes and Thyroid dysfunction.

Duration	Total no of subjects	No of subjects of Hypothyroidism
0-5 Years	30	1(3.3%)
6-10 years	33	3(9.09%)
11-15 years	20	4(20%)
➢ 15years	17	3(17.64%)



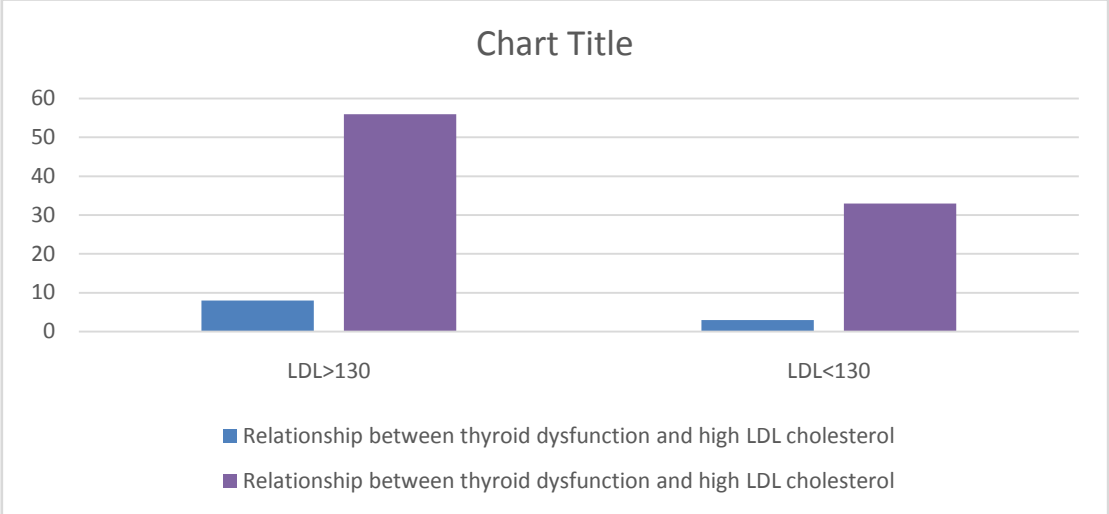
Relation between glycaemic control& thyroid dysfunction.

	Diabetes with hypothyroidism	Diabetes without Hypothyroidism
Good glycaemic control	4(36.36%)	42(47.19%)
Poor glycaemic control	7(63.63%)	47(52.80%)



Relationship between thyroid dysfunction and high LDL –Cholesterol levels.

	Diabetes with hypothyroidism	Diabetes without Hypothyroidism
LDL-Ch>130mg%	8(72.7%)	56(62.9%)
LDL-Ch<130mg%	3(27.2%)	33(37.0%)



IV. Discussion:

The present study included 100 Type2 Diabetic patients attending to the Medical outpatient department.Among these 100 Type2 Diabetic patients 11 had Thyroid dysfunction.All the 11 with Thyroid disorders are in hypothyroid state.

The present study was correlated with Smithson et al showed a prevalence of 10.8% of Thyroid dysfunction in diabetic patients(11).Radeidehetal , Perrosetal&Papazafiropoulouetal showed a prevalence of 12.3%,13.4%,12.3% respectively.(10,15,16)

In our present study among 11 patients with thyroid disorders, 9 were subclinical Hypothyroidism(9%)& 2 were of clinical Hypothyroidism (2%).Our results are in concordance with results of Perrosetal,Radaidehetal(10,17).

Among 9 subclinical Hypothyroidism patients, 2 were males and (2%),9 were females(9%).

In NHANES-III study reported that the prevalence of subclinical Hypothyroidism was 3.4% in males,5.8% in females(18).Another study conducted in Nigeria shown that the incidence of Hypothyroidism was higher in females(16.8%),when compared to males (9.9%)(13).

The present study revealed no significant correlation between HbA1C and TSH (19).

Among the Diabetic people with duration of >10 years the incidence of Hypothyroidism was 20% and those with duration >15 yrs, incidence of Hypothyroidism was 17.6%.

In our study there is no significant difference was found in the incidence of Hypothyroidism with Glycaemic control. Similarly Noberetal did not find any relationship between glycaemic control and thyroid dysfunction(6).

Among 11 hypothyroid patients 8 had LDL-Cho levels of >130mg%, 3 had LDL-Cho of<130mg%.

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