



Thyroid Dysfunction in Patient of Type 2 Diabetes Mellitus in a Tertiary Care Hospital

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Abstract

The study was intended to study the thyroid dysfunction in diabetic population. The association between thyroid and diabetes has long been recognized. This was an observations, prospective hospital based study conducted on 200 patients in medicine OPD of IGIMS, Patna from June 2014 to March 2015. Among 200 patients 57 patients was found to be of thyroid dysfunction. 34 were female and 23 were male accounting to 28.5% of prevalence. Mean TSH, T4 and T3 among diabetics were 3.79 μ IU/ml, 8.38 μ g/dl and 1.34 ng/dl respectively; and among diabetics with thyroid dysfunction were 30.44 μ IU/ml, 8.11 g/dl and 1.40 ng/dl respectively. Mean FBS, PPBS and HbA1C among diabetics were 124.87 mg/dl, 179.98% & 7.98% respectively; and among diabetics with thyroid dysfunction were 128.80 mg/dl, 182.85 mg/dl and 8.13% respectively. Mean TC, TG, LDL and HDL among diabetics were 192.79 mg/dl, 188.07 mg/dl, 110.19 mg/dl and 44.35 mg/dl respectively; and among diabetic with dyslipidemia were 191.63 mg/dl, 202.33 mg/dl, 109.15 mg/dl and 42.78mg/dl respectively. This study suggest that TSH and TG levels were significantly higher among diabetics with thyroid dysfunction.

Keyword: Diabetics, Thyroid dysfunction, Dyslipidemia, Sub- Clinical Hyperthyroid, Sub Clinical Hypothyroid.

Introduction

Among all the endocrinal and metabolic diseases, Diabetes mellitus is the most common disorder seen. Currently India is facing an epidemic of

diabetes.¹ The impact of this disease on the quality of life, and on morbidity and mortality through the complications has been emphasized by finding of the national commission (USA) on diabetes and

DCCT trial. International Diabetes Federation has projected that 438 millions individual will have diabetes by year 2030.²

Thyroid disorders are also very common in general population affecting about 5% of population, predominantly females. Thus it is common for an individual to be affected by both thyroid diseases and diabetes.³

The association between these two disorders has long been recognized although the prevalence of thyroid dysfunction in diabetic population varies widely between studies. Udiong et al has found that among diabetes 26.6% had low level of thyroid hormone while 19.9% had raised level.⁴

Patrica wu in her article has stated that diabetes patients have a higher prevalence of thyroid disorders compared with normal population (10.8% in diabetics; 6.6% in general population).⁵

R satish & V Mohan in their study shows poorly controlled diabetes results in low T3 states & a loss of TSH response to TRH.⁶ Bharat et al in their study shows serum T4 level ($5.49 \pm 4.39 \mu\text{g/dl}$) was decreased significantly in diabetics cases.⁷

Aims and Objectives

1. To investigate the prevalence of thyroid dysfunction in type 2 diabetes mellitus..
2. Whether diabetes patients should be screened for thyroid disease.

Material and Methods

The study includes all type 2 diabetes patients from OPD and Indoor of department of Medicine, IGIMS, Patna, Bihar in the period between June 2014 to March 2015. 200 patients of type 2 diabetes mellitus irrespective of their age and sex are selected in random fashion.

Inclusion Criteria

All patients with type 2 diabetes mellitus irrespective of age, sex, treatment and glucose control.

Exclusion Criteria

1. Type 1 DM
2. Other specific types of diabetics

3. Gestational DM (GDM)

4. T2DM with other endocrine disorders

Detailed history has been taken and examination done from each individual with special references to duration of DM, its complications glycaemic control (FBS, PPBS, HbA1 C) and assessment of thyroid function test (FT3, FT4, TSH), FNAC and USG of thyroid gland and other laboratory test. Data were analyzed on EPI info 7 software.

Results

In this study 200 cases of established diabetics were screened for thyroid disorder by TFT. Out of this 85 patients were males, and 115 were females. Among 200 diabetics patients abnormal thyroid functions were found in 57 patients (Table-1)

Table-1 Gender distribution

Sex	Type 2 DM	Type 2 DM with TD	Total	%
Male	62	23	85	27.05
Female	81	34	115	29.56
	143	57	200	28.5

TD: Thyroid dysfunction

Among 57 patients with thyroid dysfunctions 15 were hypothyroid, 31 were sub clinical hypothyroid, 8 were hyperthyroid, 5 were sub clinical hyperthyroidism. 6 patients were already on thyroxin for hypothyroidism.

Table-2 Prevalence of thyroid dysfunction in type 2 DM

Thyroid disorders	Number of cases	Male	Female	%
Normal	143	62	81	71.5
Hypothyroid	15	6	9	7.5
SCHypo	30	10	20	15
Hyperthyroid	7	4	3	3.5
SCHyper	5	3	2	2.5
	200	85	115	

Table-3: TSH, T4 and T3 levels in diabetics and diabetics with thyroid dysfunction

Parameter	Type 2 DM	Type 2 DM with TD
TSH (IU/ml)	3.79 ± 0.70	30.44 ± 46.03
T4 (g/dl)	8.38 ± 0.83	8.11 ± 2.86
T3 (ng/dl)	1.34 ± 0.34	1.40 ± 0.83

It is observed that TSH is higher in diabetics with thyroid dysfunction than in diabetics. Willcoxon

ranksum test is applied in TSH evaluation, while T3 and T4 are evaluated on the basis of test.

Table- 4: Mean and SD for various biochemical values in diabetics and diabetics with thyroid disorders.

Parameter	T2DM	T2DM with TD
FBS (mg/dl)	124.87±20.24	128.80±14.83
PPBS (mg/dl)	179.98±29.27	182.85±27.28
HbA1C (%)	7.98±0.86	8.13±0.67
TC (mg/dl)	192.79±24.95	191.63±27.90
TG (mg/dl)	188.07±38.87	202.33±52.29
LDL -C (mg/dl)	110.19±24.12	109.15±27.40
HDL- C (mg/dl)	44.35±6.32	42.78±5.65

Thyroid USG were done in 12 patients for thyroid enlargement. Thyroid scan and FNAC were done in 3 patients with thyroid swelling and hyperthyroidism. All 3 were diagnosed to have multi-nodular goitre.

Discussion

Diabetes is a major endocrinal and metabolic disease. The disease is responsible for significant mortality and morbidity due to its complications.⁸ A deep underlying relationship exists between diabetes and thyroid dysfunction. Various complicated interrelated genetics, biochemical and hormonal malfunction are responsible for patho physiological association between these two diseases.⁹ Ravishankar et al has reported higher prevalence of thyroid disorders in diabetic females, compared with diabetic males (36% Vs 22%). Higher number diabetic females are shown to have subclinical hypothyroidism.¹⁰ In this study 200 diabetic patients were screened for thyroid function tests. Only 8 patients were symptomatic, 5 had symptoms suggestive of hypothyroid and 3 had symptoms suggestive of hyperthyroid. Among 200 patients 85 were males and 115 were females. 143 patients had normal thyroid reports, while 57 patients had abnormal thyroid reports indicating thyroid dysfunction. So, prevalence of 28.5% of

thyroid disorders in diabetes patients were found. Subclinical hypothyroidism was most common thyroid dysfunction seen in our study in 15%. Hypothyroidism is found in 7.5%. Hyperthyroid and subclinical Hyperthyroid were found in 3.5% and 2.5% respectively. many studies had also shown similar increased incidence of sub- clinical hypothyroidism in diabetics with thyroid dysfunction. In this study we have found that there is variation in TSH, T4 and T3 level in diabetics and diabetics with thyroid dysfunctions. P value is <0.05 for TSH variation among diabetics and diabetics with thyroid dysfunction which is significant. While P value for T4 and T3 is >0.05 which is not significant among diabetics groups and diabetics with thyroid dysfunctions groups. Patients with thyroid disorders had higher level of TSH compared to those without thyroid disorders, whereas there was no much difference in T4 and T3 levels. In our study mean and standard deviation of FBS, PPBS and HbA1C among diabetics and diabetic with thyroid dysfunction were 124.87±20.24 & 128.80±14.83, 179.98±29.27 & 182.85±27.28 & 7.98±0.86 & 8.13±0.67 respectively. Statistically the variation was not significant (P<0.05). In this study we have also observed dyslipidemia in patients. We had seen increased levels of triglycerides in patients with thyroid dysfunction. P value (P= 0.035) was significant for TG in diabetics with thyroid dysfunctions. For cholesterol, LDL and HDL variation was not significant.

Conclusion

To conclude study which included patients of type 2 diabetes mellitus were assessed for the thyroid dysfunction. Data indicate that prevalence of thyroid dysfunction is 28.5%. Thyroid disorder is more common in females & subclinical hypothyroidism is most common thyroid disorder in diabetics. TSH & TG value were significantly higher in diabetics patients with thyroid dysfunction. So TSH is the preferred screening test for thyroid dysfunctions in diabetics even in asymptomatic cases.

References

1. Kaveeshwar SA, Cornwal J. The current status of diabetes mellitus in India. AMJ2014;7;1;45-48.
2. Harrison's principal of internal medicine; 18th Edition: 344, 2967-3009.
3. Davidson's Principal & practice of Medicine; 20th Edition: 20,744-762.
4. C.E.J. Udiong et al. Evaluation of thyroid function in diabetes mellitus in Calabar, Nigeria. Indian Journal of clinical Biochemistry. 2007; 22 (74-78)
5. Partica Wu. Thyroid disease and diabetes. Clinical Diabbetes winter. 2000, 18;1;56-61.
6. R Satish, v Mohan, Diabetes and Thyroid Disease- Review. Int. J. Diab Dev. Countries. 2003;23:120-123..
7. Bharat et al. J Glycmics & Lipidomics 2013, 3;1:32-37.
8. P Pasupathi, Screening for Thyroid Dysfunction in the Diabetic/ Non Diabetic population. Thyroid Science 2008;3 (8) CLS1-6.
9. Wang C. The Relationship between Type 2 DM and related Thyroid Disease. J Diabetes Res. 2013; 2013:390534
10. Ravshankar et al. A Prospective study of Thyroid Dysfunction in patients with type 2 Diabetes in General Population. Archieves of Medicine. 2013;5, 1:2. doi: 10.3823/105