STUDY OF THYROID PROFILE BY USING ULTRA SENSITIVE 3rd GENERATION THYROID ASSAY IN TYPE 2 DIABETES MELLITUS PATIENTS IN A TERTIARY CARE CENTER

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ABSTRACT

BACKGROUND

Diabetes mellitus is a common endocrine disorder which is defined as a group of metabolic diseases characterized by hyperglycaemia resulting from defects in insulin secretion, insulin action, or both. Recently few studies have shown that Thyroid dysfunction especially hypothyroidism is found in patients with Type 2 Diabetes Mellitus but the mechanism for this is largely unknown. Unrecognized thyroid dysfunction can impair metabolic control in diabetes and may even exaggerate cardiovascular risk. Prompt detection and treatment may reduce risk derangement of cellular metabolism in diabetes mellitus and help achieving metabolic control in diabetes.

AIMS AND OBJECTIVES OF THE STUDY

To find the prevalence rate of thyroid disorders in type 2 diabetes mellitus by using 3rd generation thyroid assay and distribution of thyroid disorders in patients with Type 2 diabetes mellitus

MATERIALS AND METHODS

150 patients diagnosed with type 2 diabetes mellitus or newly detected Type 2 diabetes mellitus without thyroid disorders attending outpatient departments and admitted to General medicine wards of Basaveshwar teaching and general hospital were included in this study.

RESULTS

Of the 150 patients with Diabetes 88 patients (58.66%) were male and 62 patients (41.33%) were male. The mean age in diabetic group 56.48±11.64 years. 84 patients (54%) in Diabetic group had hypertension and 25 patients (16.7%) diabetic group had coronary artery disease 43 patients (28.66%) had abnormal thyroid profile in diabetic group of which 23 patients (53.5%) had subclinical hypothyroidism and 16 patients (37.3 %) had overt hypothyroidism 2 (4.6) % patients had subclinical hyperthyroidism and 2 (4.6%) had overt hyperthyroidism.

CONCLUSION

The prevalence (28.8%) of thyroid dysfunction was common in type 2 diabetes mellitus patients. Our study shows significant co relation between abnormal thyroid profile and glycaemic control, dyslipidaemia and duration of diabetes.

KEYWORDS

Diabetes, Thyroid Profile, 3rd Generation TSH, Hypertension, Coronary Artery Disease, Hypothyroidism, Hyperthyroidism, HBA1C, Fasting and Postprandial Blood Glucose Level.

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BACKGROUND

Thyroid disorders and Diabetes have a propensity to appear together in patients and this is because of interaction between thyroid hormones and Insulin.[1] Thyroid diseases and Diabetes mellitus are the two most common endocrine disorders encountered in clinical practice. They have been shown to mutually influence each other and associations between both conditions have been reported previously.[2,3] Thyroid disease is common in the general population, and the prevalence increases with age.[4] However, there is reported higher prevalence of thyroid dysfunction in type 2 Diabetics than in the general population.[5]

The chronic hyperglycaemia of diabetes is associated with long-term damage, dysfunction, and failure of various organs, especially the eyes, kidneys, nerves, heart, and blood vessels.[6]

Insulin and thyroid hormones are both involved in cellular metabolism hence excess or deficit of either of these hormones could result in the functional derangement of the other i.e. Hyperthyroidism can result in Hyperglycemia or Hypothyroidism results in hypoglycemia.[7,8,9]

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Unrecognized thyroid dysfunction may impair metabolic control I. e. glycemic control and lipid profile, by causing hypoglycemia or hyperglycemia and it can cause an additional cardiovascular disease risk in patients with Diabetes.[10] Continuing deterioration of endocrine control exacerbates the metabolic disturbances and leads primarily to hyperglycaemia as is the case if one has hyperthyroidism. It has been noted that sustained reduction of hyperglycemia will decrease the risk of developing micro vascular complications and most likely reduce the risk of macrovascular complications in patients with type 2 Diabetes.[10]

Screening for thyroid dysfunction is indicated in certain high-risk groups, such as neonates.[11] due to the serious consequences of congenital hypothyroidism like mental retardation with delayed milestones. The elderly however, tend to be asymptomatic and thyroid dysfunction in this group is associated with dyslipidemias if hypothyroid or arrhythmias if hyperthyroid.[12] While screening in patients with type 1 Diabetes is the norm at diagnosis due to association of autoimmunity, it has been noted that there is a higher prevalence of thyroid dysfunction in patients with type 2 Diabetes than the general population, hence justification in testing for it.

Third Generation Ultrasensitive TSH Assay.[13]

1st generation TSH assay was present between 1965 and 1985. It was radio immunoassay and was a manual or semiautomated assay. 2nd generation TSH Assay was discovered in 1984 and is being used for clinical purpose since 1985. It is done by semiautomated method using Immunometric Assays. 3rd generation TSH assay was previously used for research purpose and is recently used for clinical purposes. It is done by Automated Immunometric method 4th generation TSH assay was discovered in 1992 and still used for research purpose only. Each generation is ten times more sensitive than earlier.

TSH methods have always been able to detect the TSH elevations (primary hypothyroidism).Modern-day TSH methods however, with their enhanced sensitivity are also capable of detecting low TSH values (hyperthyroidism). Most of the current methods are capable of achieving a functional sensitivity of 0.02 mIU/L or less (observed between hypo- and hyperthyroidism). With this level of sensitivity, it is possible to distinguish the profound TSH suppression typical of severe Graves' thyrotoxicosis (TSH <0.01 mIU/L) from lesser degrees of TSH suppression (0.01-0.1 mIU/L) observed with mild (subclinical) hyperthyroidism and in some patients with a non-thyroidal illness (NTI). Functional sensitivity limit of 1st generation assays (1 to 2 µIU/mL) occurs at approximately the middle of the euthyroid range for TSH concentrations. Clearly, these assays cannot distinguish between normal and suppressed TSH levels. In contrast, 2nd generation assays allow quantitation of TSH in the low normal and subnormal ranges, down to 0.1 µIU/mL. While 3rd generation assays extend the range another tenfold, down to 0.01 µIU/mL. In addition, 3rd generation assays have far superior precision in the subnormal TSH range (0.1 to 0.4 µIU/mL) compared to 2 generation assays. They can distinguish between the profoundly low basal TSH levels of thyrotoxicosis (below 0.01 µIU/mL) and mildly subnormal values (0.01 to 0.4 µIU/mL), while also providing precise and accurate TSH results throughout the euthyroid (0.4 to 4 µIU/mL) and hypothyroid (over 4 µIU/mL) ranges. And hypothyroid (over 4 µIU/mL) ranges.

MATERIALS AND METHODS

It was a cross sectional study conducted in the Department of Medicine, Basaveshwar Teaching and General Hospital (Kalaburgi), during the period from January 2015 to May 2016. The study group included 150 patients with known type 2 diabetes mellitus or newly detected Type 2 diabetes mellitus without known thyroid disorders either admitted in wards or attending the outpatient departments. Those cases with known thyroid disorders, history of other illness, pregnancy, other physical illness and physiological stress which induce alteration on the thyroid hormone were excluded from the study. Detailed history of each regarding age, sex, address, religion, occupation, marital status, personal history was taken. Informed consent of the patient was recorded in a proforma designed for the study. Approval from the ethical committee, was taken.

A thorough history was recorded with particular emphasis on symptoms of hypothyroidism and hyperthyroidism. The presence of associated illness like coronary artery disease, hypertension and cerebrovascular accident were noted. Family history regarding diabetes mellitus and treatment history of oral hypoglycaemic or insulin along with duration was also included. A thorough general and systemic examination was carried. The fundus examination for diagnosis of diabetic retinopathy and neurological examination for diabetic neuropathy were also done.

Inclusion and Exclusion Criteria

Fasting as well as post prandial blood sugar and HbA1C were estimated to know the glycemic status. Renal function tests, Liver Function Tests, Routine urinalysis, Fasting lipid profile, Chest X-ray, ECG were done wherever necessary.

Thyroid profile was done on fasting sample, TSH– Ultrasensitive 3rd generation was done by sandwich chemiluminescent immunoassay by using Siemens ADVIA Centaur® CP/XP and FT3 & FT4- Competitive chemiluminescent immunoassay methods. Reference values of the three are as follows

- TSH: 0.220-5.550 mIU/ml
- FT3: 0.7-3.5 pg/ml
- FT4: 0.8- 1.8 ng/dl

Thyroid dysfunctions were defined as follows

- Overt hypothyroidism is defined as TSH>5.55 mIU/ml with T4 <0.7 ng/dl.
- Subclinical hypothyroidism is defined as TSH >5 mIU/ml with normal FT3 and FT4 levels
- Overt hyperthyroidism is defined as TSH < 0.22 mIU/ml with T4 >1.8 ng/dl

- Subclinical hyperthyroidism is defined as TSH <0.22 mIU/ml with normal FT3 and FT4 levels.

Statistical analysis was done by using Large Sample Z test, ANOVA, LEVENE's Test and Co relation coefficient with t Test to know the significance by calculating p value.

Age	Male		Female		Total	
	No.	%	No.	%	No.	%
30-40	8	9.1	5	8.0	13	8.7
41-50	26	29.5	17	27.5	43	28.7
51-60	33	37.5	31	50.0	64	42.7
61-70	5	5.7	2	3.2	7	4.7
71-80	14	15.9	5	8.1	19	12.6
>80	2	2.3	2	3.2	4	2.6
Total	**88**	**100.0**	**62**	**100.0**	**150**	**100.0**
Mean±SD	**57.38±11.79**		**55.14±11.48**		**56.48±11.64**	

Table 1. Age and Sex Wise Distribution of Cases

Duration in Years	No. of Cases	Percentage
0-1	12	8.0
1-5	99	66.0
6-10	22	14.7
>10	17	11.3
Total	**150**	**100.0**
Mean±SD	**4.75±3.80**	

Table 2. Disease Duration Wise Distribution of Cases

		TSH* Mean±SD	F-Value	P-Value	SIG.
Sex	Male	5.31±2.42	F=1.042	P>0.05	NS$
	Female	4.89±2.67			
Age	≤50 Years	5.13±2.15	F=1.86	P>0.05	NS
	>50 Years	5.38±2.64			
Socio-eco.status	High	5.39±1.93	F=0.882	P>0.05	NS
	Low	5.13±2.53			
Duration	<5 Years	5.06±2.34	F=13.48	P<0.001	HS#
	>5 Years	5.70±2.19			

Table 3. Comparison of Thyroid Profiles with Demographic Profiles

*- Thyroid Stimulating Hormone, $ -Not Significant, # - Highly Significant.

Thyroid Profile	Number of Cases	Percentage (%)
Normal	107	71.33
Overt Hypothyroidism	16	10.67
Sub clinical hypothyroidism	23	15.34
Overt Hyperthyroidism	2	1.33
Sub clinical hyperthyroidism	2	1.33
Total	**150**	**100**

Table 4. Distribution of Thyroid Diseases in Cases

	No. of Cases	Normals	Abnormals	Levene's Test of Equality	P-Value	Significance
		TSH Mean±SD	TSH Mean±SD			
TLC	N=150 A=0	5.23±2.59	-	-	-	-
P	N=96 A=54	5.05±2.12	5.36±3.12	F=3.95	P=0.048	S
L	N=150 A=0	5.23±2.59	-	-	-	-

E	N=147 A=3	5.01±2.17	6.74±0.009	F=11.64	P<0.001	HS
M	N=96 A=54	5.84±1.9	5.23±2.16	F=0.013	P>0.05	NS
B	N=150 A=0	5.23±2.59	-	-	-	-
ESR	N=137 A=13	5.25±2.98	4.26±2.70	F=0.776	P>0.05	NS
FBS	N=108 A=42	5.03±1.9	5.63±3.62	F=10.67	P<0.001	HS
PPBS	N=39 A=111	5.1±1.54	5.41±2.81	F=4.57	P<0.05	S
HbA1c	N=9 A=141	5.17±2.3	5.23±2.15	F=10.32	P<0.005	HS

Table 5. Comparison of TSH among Normal and Abnormal of Variables in the Diabetes Cases

TLC-Total leucocyte count, P-polymorphs, L-lymphocytes, E- Eosinophils, M- Monocytes, B-Basophils, ESR – Erythrocyte Sedimentation Rate, FBS- Fasting blood sugar, PPBS- Postprandial Blood sugar, HbA1c- Glycated Haemoglobin, N- Normal, A-Abnormal, NS -Not Significant, S-Significant, HS - Highly Significant, TSH- Thyroid Stimulating Hormone

	No. of Cases	**Normal**	**Abnormal**	**Levene's Test of Equality**	**P-Value**	**Significance**
		TSH Mean±SD	**TSH Mean±SD**			
ALT	N=90 A=60	5.69±2.71	4.53±2.19	F=3.89	P<0.05	S
ALP	N=150 A=0	5.23±2.59	-	-	-	-
Total bilirubin	N=150 A=0	5.23±2.59	-	-	-	-
Direct bilirubin	N=150 A=0	5.23±2.59	-	-	-	-
Total protein	N=150 A=0	5.23±2.59	-	-	-	-
Serum albumin	N=117 A=33	5.51±2.61	4.23±2.12	F=3.75	P<0.05	S
Blood urea	N=150 A=0	5.23±2.59	-	-	-	-
Serum creatinine	N=144 A=6	5.19±2.18	5.81±2.6	F=1.13	P>0.05	NS

Table 6. Comparison of TSH among Normal and Abnormal of Variables in the Diabetes Cases

ALT- Alanine Transaminase, ALP- Alkaline phosphatase, N- Normal, A- Abnormal, NS -Not Significant, S-Significant, HS-Highly Significant, TSH- Thyroid Stimulating Hormone.

	Normals	**Abnormals**	**Levene's Test of Eqality**	**P-Value**	**Significance**
	TSH Mean±SD	**TSH Mean±SD**			
TC	4.53±2.19	6.19±2.63	F=11.89	P<0.001	HS
TG	5.13±2.59	5.52±2.81	F=1.79	P>0.05	NS
HDL-C	4.62	6.38	F=15.41	P<0.001	HS
LDL-C	6.41	4.51	F=16.87	P<0.001	HS

Table 7. Comparison of TSH among Normal and Abnormal of Lipid Profiles in the Diabetes Cases

TC-Total Cholesterol, TG- Triglycerides, HDL-C- High Density Lipoprotein Cholesterol, LDL-C-Low Density Lipoprotein Cholesterol, NS -Not Significant, S-Significant, HS - Highly Significant, TSH- Thyroid Stimulating Hormone

	No. of Cases	Normal TSH Mean±SD	Abnormal TSH Mean±SD	F-Value	P-Value & Sig.
Nephropathy	N=144 A=6	5.19±2.18	5.81±2.6	F=1.13	P>0.05 NS
Retinopathy	N=121 A=29	5.63±2.59	5.13±2.59	F=1.82	P>0.05 NS
Peripheral Neuropathy	N=150 A=0	5.23±2.59	-	-	-
Peripheral vascular disease	N=141 A=9	5.33±2.29	5.51±2.6	F=1.23	P>0.05 NS

Table 8. Comparison of TSH with Complications of Diabetes

N- Normal, A- Abnormal, NS -Not Significant, S-Significant, HS - Highly Significant, TSH- Thyroid Stimulating Hormone

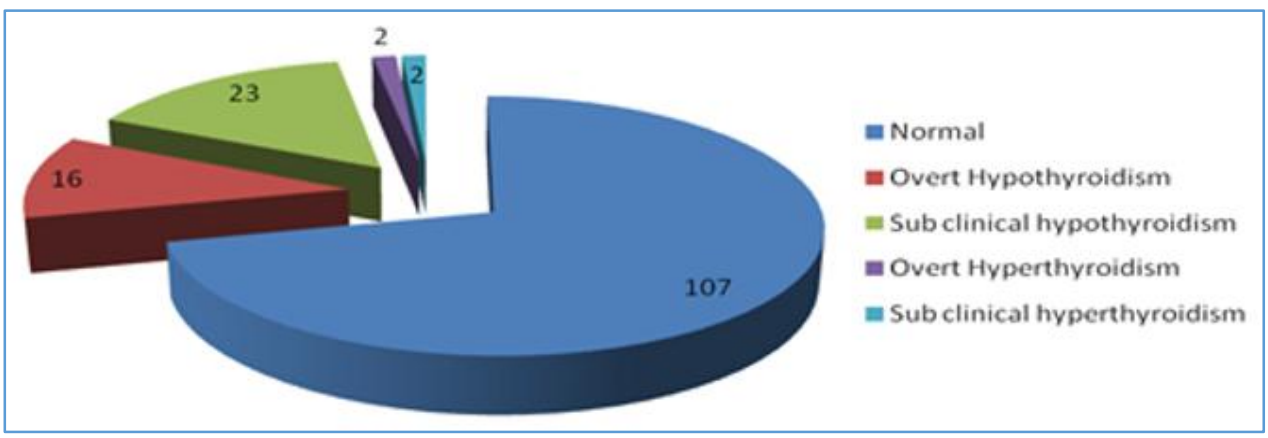

Figure 1. Pie Chart of Distribution of Thyroid Dysfunction

RESULTS AND DISCUSSION

Diabetes mellitus is the most common endocrine disorder which involves multiple organ systems and leads to significant morbidity and mortality due to accompanying complications. Thyroid diseases are also a common endocrinopathy seen in the adult population. Thyroid hormones are intimately involved in cellular metabolism. Thus excess or deficit of either insulin or thyroid hormone could result in the functional derangement of the cellular metabolism.

Age, sex, and duration of disease Were as in table 1,2 and 3. Minimum and maximum age of cases is 35 years and 88 years respectively. Mean age of Presentation was 56.48±11.64 years. Of 150 cases, 88 (58.66%) of cases were males and 62 (41.33%) of cases were females. Table 4 and figure 1 shows the distribution of thyroid disease diabetic cases. 43 (28.67%) had abnormal thyroid function. Of these 23 (15.34%) had subclinical hypothyroidism 16 (10.66%) of 150 had overt hypothyroidism and 2 (1.33%) each had subclinical and overt hypothyroidism. Table 5, 6 and 7 shows the levels of various biochemical parameters. Serum cholesterol, serum TG, LDL, VLDL, Blood urea, serum creatinine, Liver function tests, etc. and their co relation with abnormal thyroid profile among diabetic patients. Of liver enzymes SGPT was found abnormal with thyroid abnormalities with p value less than 0.05 which is statistically significant. Serum Albumin levels were also found abnormal in cases with abnormal TSH levels which was also statistically significant with p value being less than 0.05. Serum Creatinine levels were found abnormal in six cases which had no correlation with abnormal thyroid levels. Table 8 shows the comparison of complication of diabetes mellitus and their correlation with thyroid dysfunction. Of 150 cases 6 had Nephropathy, 29 had retinopathy, 9 had peripheral vascular disease.

AGE

Of 150 type 2 diabetic patients, 13 belonged to age group of 30 to 40 years, 43 belonged to the age group of 41 to 50 years, 54 belonged to the age group of 51 to 60 years, 7 belonged to the age group of 61 to 70 years, 19 belonged to the group of 71 to 80 years and 4 were aged more than 80 years. This observation was similar to WHO report which predicts that while the main increase in diabetes would be in the >65 year age group in the developed countries, in India and developing countries the highest increase would occur in the age group of 45-65 year of age group.[14] This observation is also similar to Kapur et al, who reported that maximum number of cases were diagnosed between 40 and 59 year of age with no significant difference between the genders.[15] Among the patients in Diabetic group with abnormal thyroid profile, 23 (54%) were of age less than 50 years and 20 (46%) were of age more than 50 years showing no significant association of age with thyroid dysfunction.

Gender

In the present study, 88(58.66%) of cases were males and 62 (41.33) of cases were females. In those having thyroid abnormalities 22 (52%) patients were found to be female compared to 21 (48%) male in the group with abnormal thyroid profile. Though females were slightly more than males, there was no significant difference between the gender distributions. Celani MF et al, Arthur M. Michalek et al and Abdel-Rahman et al in their study found that the prevalence of thyroid dysfunction was significantly higher in the female than in the male diabetic patients.[16,17,18] Also Vondra et al and Cardoso et al found significant correlation between female gender and altered thyroid profile.[19]

Abnormal Thyroid Profile

In the present study, 28.6% (43 in number) of the total 150 patients with diabetes mellitus had abnormal thyroid profile. The present study has similar findings to Laloo Demistrot et al[20] in Manipur India in 2012 who in his study of 202 type 2 diabetic patients found that the prevalence of thyroid disease was 31.2% Pashupathi et al in his study found that the prevalence of thyroid dysfunction in sample of 200 type 2 diabetic patients was 45% which was found to be higher than our study The present study shows higher prevalence of thyroid abnormalities to Abdel-Rahman et al who in his study of 908 type 2 diabetic patients found that the prevalence of thyroid disease was 12.5%, 6.6% of whom were newly diagnosed and 5.9% had known thyroid dysfunction. The prevalence of thyroid disease in the non-diabetic control group was 6.6%.[21] Chubb et al in a cross-sectional study of 420 patients with type 2 diabetes mellitus found that 8.6% of patients had subclinical hypothyroidism.[22] Smithson M J in his study found that the prevalence of thyroid disease in the entire population of diabetic patients registered in the general practice was 10.8%. In the control group of non-diabetics, the prevalence was 6.6%.[23] D.H. Akbar et al in their study of 100 type 2 diabetics found that the prevalence of thyroid dysfunction was 16% and in control group of non-diabetics, it was 7%.[24] EL Nobre et al[25] in their study showed association between diabetes mellitus and abnormal thyroid profile which is like our finding. Zdrojewicz et al in their study of 75 diabetic patients found that there were no differences in thyroid gland function between patients with type 2 diabetes mellitus and non- diabetics. This study contradicts our findings.[26] Nima V. Thakkar et al[27] in their study of The Impact of Diabetes on Thyroid Dysfunction and Outcomes in a Native Indian Female Population found no significant co relation type 2 diabetes and hypothyroidism.

Distribution of Thyroid Abnormalities

In the present study, 15.34% (23 in number) of the patients had report suggestive of sub clinical hypothyroidism and 1.5%% (2 in number) of the patients had report suggestive of sub clinical hyperthyroidism and 10.67% (16 in number) had overt hypothyroidism and 1.5%(2 in number) had overt hyperthyroidism. This study was similar to Abdel-Rahman et al who in their study of 908 type 2 diabetic patients found that 10.3% of patients had hypothyroidism (overt and sub clinical) and 1.7% of patients had hyperthyroidism (overt and sub clinical).[18] Smithson et al in their study of 233 diabetes mellitus patients found that 11 patients were found to have undiagnosed thyroid disease, out of which 9 were having hypothyroidism (overt and sub clinical) and 2 were having hyperthyroidism (overt and sub clinical).[23] Celani MF et al in their study of 290 type 2 diabetes mellitus patients found that 91 patients (31.4%) had abnormal TSH concentrations out of which 48.3% had sub clinical hypothyroidism, 24.2% had sub clinical hyperthyroidism, 23.1% had overt hypothyroidism and 4.4% had overt hyperthyroidism.

Duration of Diabetes and Abnormal Thyroid Profile

In the present study of 43 cases 30 (70%) had duration of diabetes more than 5 years and 13 (30%) which was statistically significant with p value being less than 0.001. This is in comparison with R Ngugi et al in Nairobi who showed mean duration to be 9 years in their study with study sample of 180 diabetic patients. Similar results were found by Al Wazzan et al in Kuwait showing mean duration of 10 years.[21] These studies confirm our finding. The present study findings contradict with that of Chubb et al who in their study found that age and anti – TPO status correlates with altered thyroid profile in diabetic patients.[23] Vondra et al in his study found that thyroid diseases in diabetic patients is 2-3 times higher than in nondiabetic subjects; it raises with age, and is strongly influenced by female gender and autoimmune diabetes.

Blood Sugar Level in Cases with Normal and Abnormal Thyroid Profile

Out of 43 patients in diabetic group with abnormal thyroid profile, 72% (31) had HbA1C value above 8 and the remaining had HbA1C 8 or less. This difference is statistically significant. Similarly statistically significant co relation was found between FBS and PPBS. Celani MF et al in their study in[16] diabetic patients with altered thyroid profile found that TSH level in serum decreased in subclinical hypothyroidism and increased in subclinical hyperthyroidism with significant raise in HbA1C level. Similar findings were found in our study. Diez JJ et al showed that there were no significant relationships between the presence of thyroid dysfunction and duration of diabetes, haemoglobin A1c levels, and the presence of diabetic complications.[28]

Serum Lipid Profile in Patients with Abnormal Thyroid Profile

In the present study, 50% (75 in number) of the study group had raised total cholesterol level; 84% (126 in number) had raised triglycerides level; 44% (66 in number) had decreased HDL-C level and 50% (75 in number) had raised LDL-C levels. This shows that the incidence of dyslipidaemia is high in diabetics. Liao et al reported that patients who had diabetic glycaemic tolerance had more of intra-abdominal fat, higher triglyceride levels, lower HDL cholesterol levels and higher blood pressure than those with Normal glucose

tolerance.[29] A. Southwell et al in their study found that 40% of the diabetics had hypercholesterolemia.[30]

In diabetic group, significant co relation was found between HDL-C level, LDL-C level, total cholesterol level with respect to abnormal thyroid profile. S.A.P. Chubb et al in their sub study of Fremantle diabetes study found that there were strong association between TSH and lipid parameters with adverse cardiac risks at low insulin sensitivity that were absent at higher insulin sensitivity.[22] Bakker SJL et al also concluded the same in their study in non-diabetic individuals with insulin resistance.[31] Both these studies support our findings.

CONCLUSION

- Prevalence of thyroid dysfunction is common among type 2 diabetes mellitus patients with prevalence of 28.66%.
- Hypothyroidism including subclinical hypothyroidism is common among patients with thyroid dysfunction in patients with type 2 diabetes mellitus.
- Prevalence of thyroid dysfunction in patients with type 2 diabetes mellitus is higher in patients with duration of disease more than 5 years.
- There is significant correlation between abnormal thyroid profile and serum lipid profile. However no co relation was seen between abnormal thyroid profile and Age, Gender and socio economic status of the patients.
- There is significant co relation between diabetic control (FBS,PPBS and HbA1c) and abnormal thyroid profile. However no relation was seen between complications of diabetes like retinopathy , peripheral vascular disease and neuropathy and thyroid dysfunction.
- Routine screening for thyroid dysfunction in type 2 diabetes mellitus patients may be justified because the progression to overt thyroid dysfunction is associated with significant morbidity including the adverse effects on glycaemic control, lipid profile.
- 3rd generation TSH assay as routine screening in patients with Type 2 Diabetes Mellitus to know the status of Thyroid profile is helpful to assess the status and for further management to prevent progression of disease.

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