

STUDY OF PREVALENCE OF THYROID DYSFUNCTION IN TYPE 2 DM IN RURAL POPULATION

Nanjil Kumaran A¹, G. Prabhu², S. Balasubramaniyan³, Selvamuthukumar⁴, Geeravani M⁵, Nagateja D⁶

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ABSTRACT: Thyroid disease and diabetes are the two common endocrine disorders encountered in the clinical practice. Type 2 DM is a growing problem in our country and we have observed that many patients are associated with thyroid dysfunction later in their life. The aim of the study is to investigate the prevalence of thyroid dysfunction in patients with Type 2 DM in rural population.

METHODS AND MATERIALS: A total of 100 patients attending diabetic clinic in Rajah Muthiah Medical College and Hospital were enrolled in the study and were randomized into test and control groups. 70 Type 2 DM patients aged more than 18 years of both genders, Type II DM was diagnosed as patients who initially respond to OHA were included in the test group. Patient with thyroid dysfunction, Type 1 DM, chronic kidney disease were excluded. 30 Patients age matched control group without any history of diabetes and thyroid disease was taken for the study. **RESULTS:** In this study abnormal thyroid function was seen in 17 patients of Type 2 DM and remaining had normal thyroid function. The study shows prevalence of thyroid dysfunction is more in males compared with females. 10 out of 29 (34.4%) males had thyroid dysfunction compared with that 7 out of 41 (17%) females are suffering from thyroid dysfunction. **CONCLUSION:** There is growing evidence of an association between thyroid dysfunction and diabetes. Our study shows that higher prevalence of abnormal thyroid hormone levels in Type 2 DM.

KEYWORDS: Type 2 DM, Thyroid dysfunction.

INTRODUCTION: Type 2 DM is a growing problem in our country and we have observed that many patients are associated with thyroid dysfunction later in their life. Thyroid disease and diabetes are the two common endocrine disorders encountered in the clinical practice. Diabetes and thyroid disorder have been shown to mutually influence each other. On one hand, thyroid hormone contributes to the regulation of carbohydrate metabolism and pancreatic function and on the other hand, diabetes affects thyroid function tests to variable extents. The unrecognized thyroid dysfunction in Type 2 DM may adversely affect the metabolic control and add more risk to an already predisposing scenario for cardiovascular disease. Screening of thyroid dysfunction, especially the subclinical dysfunction, in patients with Type 2 DM is justified because most patients can be asymptomatic. Determine the prevalence of clinical and subclinical thyroid disease in diabetic patients in our country and its implications in the course of diabetes is necessary. The aim of the study is to investigate the prevalence of thyroid dysfunction in patients with Type 2 DM in rural population.

METHODS AND MATERIALS: The present study is an observational cross sectional study done in Rajah Muthiah Medical College and Hospital, Chidambaram. It is a 1200 bedded multi-specialty tertiary care teaching hospital serving the rural population. The study was carried over a period of 6 months from January 2015 to June 2015.

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A total of 100 patients were enrolled in the study and were randomized into test and control groups. 70 Type 2 DM patients aged more than 18 years of both genders, Type 2 DM was diagnosed as patients who initially respond to OHA were included in the test group. Patients with thyroid dysfunction, Type 1 DM, chronic kidney disease were excluded. 30 patients age matched control group without any history of diabetes and thyroid disease was taken for the study. All patients subjected to the study were obtained informed consent. Both the study group as well as control group was obtained with detail clinical history signifying DM and thyroid dysfunction, evaluated for BMI, HbA1C and thyroid function test. Thyroid function test was done by chemi luminescent immune assay.

RESULTS: The present study was carried out on a 100 subjects. Subjects were divided into two groups. First test group which consists of 70 (29 males & 41 females) subjects with known Type 2 DM. Second control group consists of 30 (18 males & 12 females) subjects without any complaints of diabetes and history of thyroid disorders. This study analyzed thyroid profile (Free T3, T4 & TSH values) in Type 2 DM compared with controlled subjects.

Age in Years	Test	Control
Up to 30	1(1.42%)	-
31-40	12(17.1%)	5(16.6%)
41-50	23(32.8%)	10(33.3%)
51-60	24(34.28%)	15(50%)
61-70	10(14.2%)	-
>70	-	-
Total	70	30

Table 1: Age distribution of the study patients

In this study Type 2 DM incidence picks most economically age group of 41-60 years.

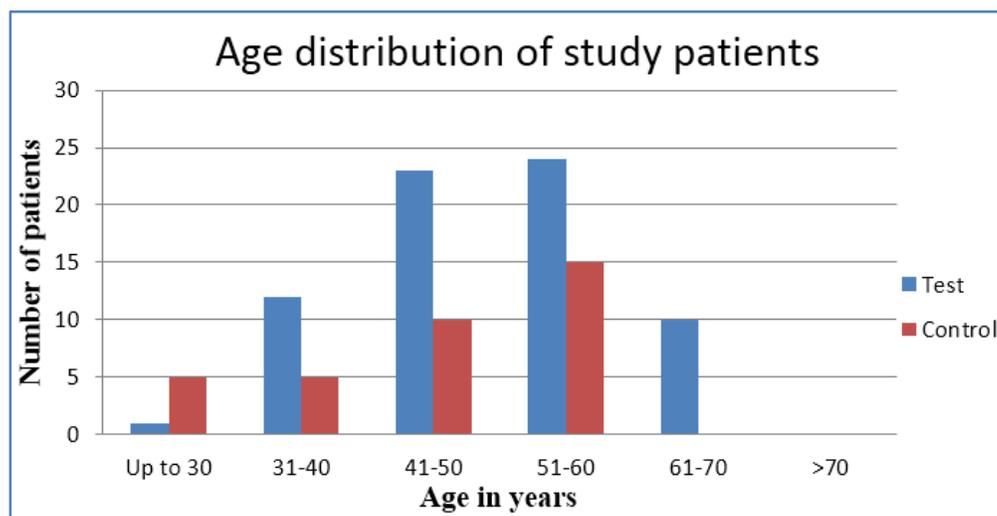


Fig. 1: Age distribution of the study patients

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Gender	Test	Control
Male	29	18
Female	41	12

Table 2: Gender wise distribution of the patients

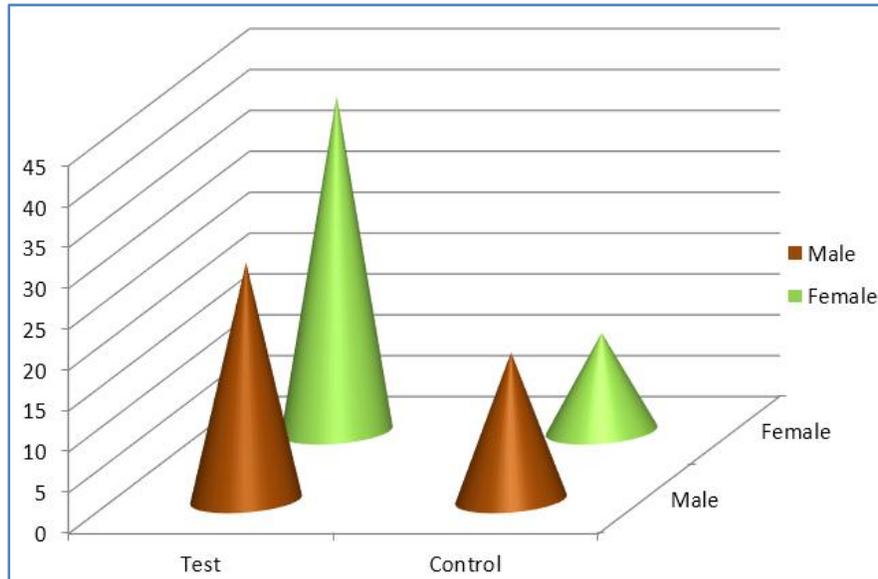


Fig. 2: Gender distribution in the study

In the present study females dominated the prevalence of Type 2 DM in rural population.

BMI(Kg/m ²)	Frequency
15-19.99	9
20-24.99	23
25-29.99	33
30-34.99	5
35-39.99	-

Table 3: Distribution of BMI

In the present study out of 70 diabetic patients 33 patients are overweight (25-29.99 kg/m²) followed by 5 patients in mild obesity range.

Duration of DM	Number of Patients	Thyroid Disorders	%
0-5yrs	32	6	18.75
6-10yrs	21	5	23.8
>11yrs	17	6	35.2

Table 4: Thyroid dysfunction in relation to duration of DM

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HbA1C Values in %	Number of Patients
<6%	7
6-7%	19
7-8%	13
8-9%	15
>9%	16

Table 5: Glycemic control of test population

In the present study 44 out of 70 patients had HbA1c of more than 7% indicating poor glycaemic status.

Thyroid disorders	Test	Control
Normal	53	28
Hypothyroidism	-	-
Sub-clinical hypothyroidism	17	2
Hyperthyroidism	-	-

Table 6: Prevalence of thyroid dysfunction

In this study abnormal thyroid function was seen in 17 patients of Type 2 DM and remaining had normal thyroid function.

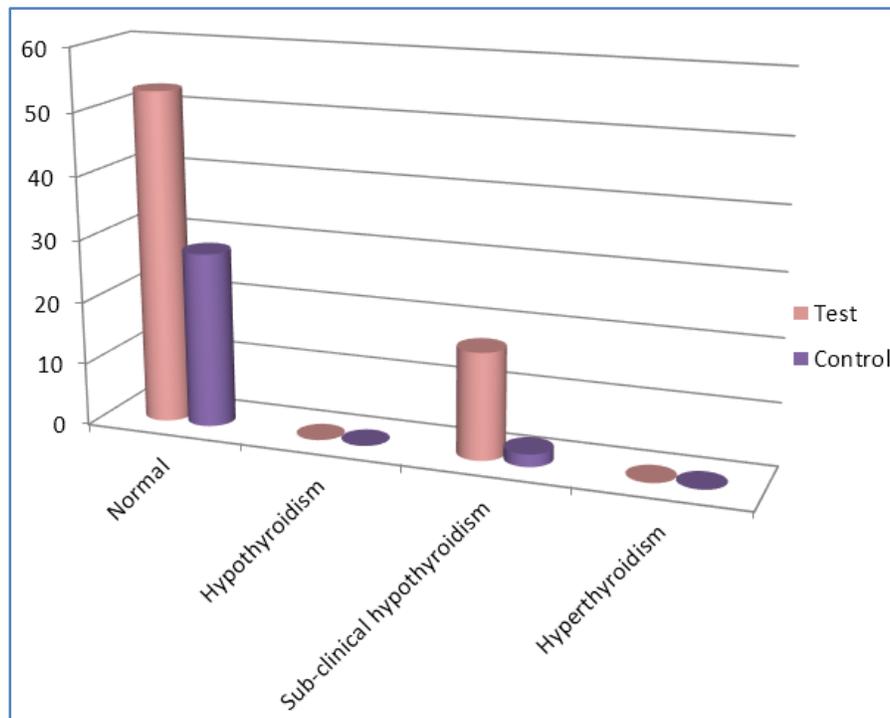


Fig. 3: Prevalence of thyroid dysfunction in patients

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Sex	Hypothyroidism	Sub-clinical hypothyroidism	Hyperthyroidism	Normal
Male	-	10	-	19
Female	-	7	-	34

Table 7: Sex distribution of thyroid dysfunction in diabetes

The study shows prevalence of thyroid dysfunction is more in males compared with females. 10 out of 29 (34.4%) males had thyroid dysfunction compared with that 7 out of 41(17%) females are suffering from thyroid dysfunction.

Parameters	Test	Control
T3(pg/dl)	0.335±0.847	0.329±0.0729
T4(ng/dl)	1.507±0.518	1.56±0.570
TSH(MIU/ml)	3.603±2.401	2.392±1.807

Table 8: Comparison of thyroid parameters

*P= <0.001

In this study abnormal level of thyroid hormones is seen more in Type 2 DM patients compared with that of non-diabetic patients. The levels of serum TSH were significantly increased while serum T3 and T4 levels were significantly equal in test group when compared to controls.

DISCUSSION: Diabetes mellitus, a heterogeneous endocrine metabolic disorder which is an important health problem affecting major population worldwide. This disease is responsible for the significant morbidity and mortality in public health due to its complications.^[1] Sequential surveys indicate that the prevalence of diabetes has risen steadily since the 1970s from India compared to the other countries.^[2,3&4] DM is commonly associated with abnormal thyroid functions. The thyroid hormones are insulin antagonist that also potentiates the action of insulin in directly TRH synthesis decreases in diabetes mellitus. These reason shows which is responsible for the low TSH values in some diabetic patients.^[5] Insulin, an anabolic hormone increases the levels of FT4 by decreasing the levels of T3 from inhibiting hepatic conversion of T4-T3. The present study was conducted to study the prevalence of thyroid dysfunction and to assess the thyroid dysfunction in Type 2 DM patients.

In this study out of 70 diabetic patients 17(24.2%) patients found with thyroid dysfunction. The present study shows higher incidence of sub clinical hypothyroidism i.e., 10(34.4%) males out of 29 and 7(17.07%) females out of 41 shows abnormal thyroid hormone levels in diabetics.

Pasupathi et al., in their study found that prevalence of thyroid disorder was 45% among type 2 diabetics. Hypothyroidism was present in 28% and 17% had hyperthyroidism.^[6]

Penugonda Anveetha et al., in their study found that prevalence of thyroid dysfunction of 26.7% among Type 2 DM, 16.7% had hypothyroidism and 10% had hyperthyroidism.^[7]

Dr. Ravishankar, S.N et al., study reports shows that prevalence of thyroid disorders in Diabetics was 29%.Subclinical hypothyroidism was detected in 38% of all the hypothyroid subjects.^[8]

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The results of the present study showed that the levels of serum T3, T4 were significantly equal in diabetics while serum TSH was significantly higher in diabetics when compared to that of controls.

Reeta Taksali et al., in their study shows increased TSH values of the Type 2 DM patients when compared with that of control group patients.^[1]

Shekhar Chandra Yadav et al., study report shows the elevated TSH values of diabetic patients compared to that of control group patients.^[9]

CONCLUSION: There is growing evidence of an association between thyroid dysfunction and diabetes. Our study shows that higher prevalence of abnormal thyroid hormone levels in Type 2 DM. This study demonstrates that the levels of serum T3, T4 were significantly equal in diabetics while serum TSH was significantly higher in diabetics when compared to that of controls. Sub-clinical hypothyroidism was more common than other conditions which constituted 24.28% of the thyroid dysfunction in the Diabetics. Thyroid disorders are more in males 34.4% compared with that of females 17.07%. Treatment of Sub-clinical hypothyroidism is important in Type 2 DM patients because if left untreated it further increases the risk of atherosclerosis, nephropathy and retinopathy. Hence our study recommends the routine test of thyroid hormones in all Type 2 DM patients in the starting of diagnosis and follow up. Type 2 DM patients are at more risk of subclinical hypothyroidism and hence need to be followed by regular screening of thyroid profile to achieve the good glycaemic control, to improve the quality of life and to decrease the complications of NIDDM.

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AUTHORS:

1. Nanjil Kumaran A.
2. G. Prabhu
3. S. Balasubramaniyan
4. Selvamuthukumaran
5. Geeravani M.
6. Nagateja D.

PARTICULARS OF CONTRIBUTORS:

1. Post Graduate, Department of General Medicine, Rajah Muthiah Medical College.
2. Lecturer, Department of General Medicine, Rajah Muthiah Medical College.
3. Professor & HOD, Department of General Medicine, Rajah Muthiah Medical College.
4. Reader, Department of General Medicine, Rajah Muthiah Medical College.

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5. Pharm D, Department of Pharmacy, Annamalai University.
6. Pharm D, Department of Pharmacy, Annamalai University.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Nanjil Kumaran A,
Post Graduate,
Department of General Medicine,
Rajah Muthiah Medical College & Hospital,
Chidambaram-608002.
E-mail: kggprabhu@gmail.com

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