



## "ASSESSMENT OF THYROID DYSFUNCTION IN TYPE 2 DIABETES MELLITUS"

**Dr.V.Vivek Paul Benjamin**

Post Graduate Department of General Medicine Meenakshi Medical College and Research institute, Kanchipuram

**Dr.S. Dilipan**

Department of General Medicine Meenakshi Medical College and Research institute, Kanchipuram.

**Dr.S.Natarajan**

Professor and Head Department of General Medicine Meenakshi Medical College and Research institute, Kanchipuram.

**Dr.S.Kirubakaran**

Assistant Professor Department of Community Medicine Aarupadai Veedu Medical College and Hospital Puducherry.

### ABSTRACT

**Background:** 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.

**Methodology:** It is a Hospital based Cross sectional study carried out in Meenakshi Medical College Hospital and Research Institute (MMCH & RI) in 100 study participants

**Results:** Out of 100 participants 41 were male and 59 were female. Out of 14 patients with abnormal thyroid profile, 14.3% (2) were males and 85.7% (12) were females. Compared with normal thyroid profile group, this is statistically significant. Among the 14 patients with abnormal thyroid profile, 28.6% (4) had Diabetes more than 10 years, 28.6% (4) had duration between 6-10 years and 42.8% (6) had Diabetes 5 years or less. Compared with normal thyroid group it is statistically significant.

**Conclusion:** Prevalence of thyroid dysfunction in patients with type 2 diabetes mellitus is higher in females than in males. There is significant correlation between Duration of diabetes.

**KEYWORDS :** Diabetes Mellitus, Thyroid profile, Duration, Gender distribution

### Introduction:-

Diabetes mellitus is a common endocrine disorder which involves multiple organ systems and leads to significant morbidity and mortality due to accompanying complications. Much has been accomplished in the field of diabetes but what has been troubling one and all are the large macro vascular and micro vascular complications of diabetes involving kidneys, eyes, blood vessels, nerves and heart.

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 hormones could result in the functional derangement of the cellular metabolism. The present work is a modest attempt to study the prevalence of thyroid disorders in patients with type 2 diabetes mellitus with the following objectives.

### Objectives:-

1. To study the prevalence of thyroid disorders in patients with type 2 diabetes mellitus.
2. To study the distribution of thyroid disorders in patients with type 2 diabetes mellitus regarding age, sex and duration of diabetes.

### Materials and Methods:-

#### Study design and setting:

It is a Hospital based Cross sectional study carried out in the Department of General Medicine, Meenakshi Medical College Hospital and Research Institute (MMCH & RI), Enathur.

#### Study duration:

This study was conducted in the period of May 2015 to May 2016.

#### Study Participants:

The study participants were known type 2 diabetes mellitus or newly detected Type 2 diabetes mellitus without known thyroid disorders either admitted inwards or attending the outpatient departments who met the inclusion criteria.

### Sample size and Sampling:

The study sample was 100 participants with the following inclusion and exclusion criteria.

#### Inclusion criteria

- Known type 2 diabetes mellitus and newly detected type 2 diabetes mellitus subjects who gave informed consent to participate in the study.
- Age above 25 years.
- Both In-patients and Out -patients of MMCH & RI.

#### Exclusion criteria

- Patients not willing for study.
- Patients with known thyroid disease in Diabetes Mellitus.
- Any other significant health condition.

#### Data Collection:-

All patients in the study group were selected without any bias for sex, duration, severity or control of diabetes. A thorough history was recorded with particular emphasis on symptoms of hypothyroidism and hyperthyroidism.

#### Thyroid Profile

Estimation done in fasting serum sample.

#### Methods used:

1. TSH – Ultra sensitive sandwich chemi luminescent immuno assay
2. FT3 & FT4 - Competitive chemi luminescent immuno assay.

Thyroid profile

Reference values: FT3: 1.7-4.2 pg/ml

FT4: 0.7-1.8 ng/dl

TSH: 0.35-5 IU/ml

- Overt hypothyroidism is defined as TSH >5.5 IU/ml with FT4 < 0.7 ng/dl.
- Subclinical hypothyroidism is defined as TSH > 5 IU/ml with normal FT3 and FT4 levels.
- Overt hyperthyroidism is defined as TSH < 0.3 IU/ml with FT4 > 1.8 ng/dl.
- Subclinical hyperthyroidism is defined as TSH < 0.3 IU/ml with normal FT3 and FT4 levels.

### Results:-

Out of 100 participants 41 were male and 59 were female. Age distribution Upto 40 years of age were 13%, 41-60 age group were 72% and 61 & above were 15%.

Duration of DM (in years)	No. of cases
Up to 5 years	70
6-10 years	19
>10 years	11
<b>Total</b>	<b>100</b>

Table 1, describes the duration of diabetes mellitus among the study participants Upto 5 years of duration were 70%, 6-10 years of duration of diabetes mellitus were 19% and >10 years of diabetes mellitus were 11%.

Sex	Abnormal thyroid Profile	
	No	Yes
Male	39 (45.3%)	2 (14.3%)
Female	47 (54.7%)	12 (85.7%)

**P = 0.028**

Out of 14 patients with abnormal thyroid profile, 14.3% (2) were males and 85.7% (12) were females. Compared with normal thyroid profile group, this is statistically significant.

Duration (yrs)	Altered thyroid profile	
	No	Yes
Up to 5	64 (74.4%)	6 (42.8%)
6-10	15 (17.5%)	4 (28.6%)
>10	7 (8.1%)	4 (28.6%)

**p = 0.029**

Among the 14 patients with abnormal thyroid profile, 28.6% (4) had Diabetes more than 10 years, 28.6% (4) had duration between 6-10 years and 42.8% (6) had Diabetes 5 years or less. Compared with normal thyroid group it is statistically significant.

### Discussion:-

In the present study of 100 type 2 diabetic patients, 13 patients (13%) were up to 40 years, 72 patients (72%) were between 41-60 years and 15 patients (15%) were 61 years or more. This shows that the disease was more prevalent between 41-60 years of age.

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<sup>1</sup>. This observation is also similar to Kapur et al, who reported that maximum number of cases was diagnosed between 40 and 59 year of age with no significant difference between the genders<sup>2</sup>.

In the present study 41% (41) of the studied population were males and 59% (59) were females. Female to male ratio was 1.43:1. This observation was similar to Arthur M. Michalek et al who reported

that prevalence of diabetes among women was higher than in men<sup>3</sup>. This is in contrast to Jali et al<sup>4</sup> and Flatau E et al<sup>5</sup>, who reported that diabetes was more prevalent in men than in women. Sample size in our study is too small. This might have affected the results.

In the present study 85.7% (12/14) patients were found to be female compared to 14.3% (2/12) male in the group with abnormal thyroid profile. Compared between patients with normal and abnormal thyroid profile this is statistically significant (p=0.031). 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<sup>6,7,8</sup>. Also Vondra et al and Cardoso et al found significant correlation between female gender and altered thyroid profile<sup>9,10</sup>.

In the present study, majority of cases that is 70% (70/100) had duration of diabetes up to 5 years, 19% (19/100) of patients had duration between 6-10 years and 11% (11/100) of patients had duration of illness more than 10 years. Majority of people are in the age group between 41 to 60 yrs and have duration of disease less than 5 years.

### Conclusion and Recommendations:-

Prevalence of thyroid dysfunction is more common among type 2 diabetes mellitus patients than in general population. Prevalence of thyroid dysfunction in patients with type 2 diabetes mellitus is higher in females than in males. There is significant correlation between Duration of diabetes. Routine screening for thyroid dysfunction in type 2 diabetes mellitus patients may be justified especially in females because the progression to overt thyroid dysfunction is associated with significant morbidity.

Biochemical tests of thyroid functions are readily available and relatively inexpensive. So, a baseline thyroid function test to be done in all type 2 diabetic patients at first visit especially in females. Longitudinal studies are needed to find out the incidence of thyroid dysfunction in type 2 diabetes mellitus patients and to determine the need of regular screening for thyroid dysfunction during follow up and its cost effectiveness.

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