



STUDY ON PREVALENCE OF SUBCLINICAL HYPOTHYROIDISM IN ELDERLY AGE GROUP AND ITS RELATION WITH DIABETES, HYPERTENSION AND ISCHEMIC HEART DISEASE

General Medicine

**Dr. Omkaram
Siddhardha Varma**

Postgraduate, Department of General Medicine, Narayana Medical College & Hospital.

Dr. V. Mahesh

Associate Professor, Department of General Medicine, Narayana Medical College & Hospital.

**Dr. M. Rajesh
Kumar**

Professor, Department of General Medicine, Narayana Medical College & Hospital.

ABSTRACT

Background: Clinical manifestation of subclinical hypothyroidism include abnormal lipid metabolism, cardiac dysfunction and neurological and mental dysfunction and Several cross-sectional studies have suggested that it confers an elevated risk for atherosclerosis and coronary heart disease. **Aim Of The Study:** To estimate the prevalence of subclinical hypothyroidism above the age of 60 years and to study the relationship of subclinical hypothyroidism to Hypertension, Diabetes and Ischemic Heart Disease in those patients. **Methods:** This is a cross-sectional study in Patients above the age of 60 years attending Medical outpatient clinic of Narayana Medical College and Hospital. All the participants are examined for thyroid function. patients with subclinical hypothyroidism (defined as TSH > 5.5 μIU/ml with normal free T4 and free T3) were considered as cases, and patients without subclinical hypothyroidism were considered as controls. **Results:** 100 participants were examined for thyroid function. patients with subclinical hypothyroidism (defined as TSH > 5.5 μIU/ml with normal free T4 and free T3) were considered as cases, and patients without subclinical hypothyroidism were considered as controls. Prevalence was found to be 20%. In the present study, the mean TSH levels was 6.10 ± 2.36 . 20% had TSH level >5.5 μIU/ml. 80% had TSH levels below 5.5 μIU/ml. **Conclusion:** Prevalence of subclinical hypothyroidism is 20% in the present study, it is highly prevalent in elderly women. Symptoms of hypothyroidism are seen in patients with subclinical Hypothyroidism (and around 40% in the present study) fatigability, constipation weight gain are the most common symptoms. Subclinical hypothyroidism is significantly related with diabetes and hypertension but not with ischemic heart disease in the present study.

KEYWORDS

INTRODUCTION

Subclinical hypothyroidism (SCH), also called mild thyroid failure, is diagnosed when peripheral thyroid hormone levels are within normal reference laboratory range but serum thyroid-stimulating hormone (TSH) levels are mildly elevated. This condition occurs in 3% to 8% of the general population. It is more common in women than men, and its prevalence increases with age. Of patients with SCH, 80% have a serum TSH of less than 10 mIU/L.

The most important implication of SCH is high likelihood of progression to clinical hypothyroidism. The possibility that it is a cardiovascular risk factor has been a subject of debate. Large-scale randomized studies are needed for evidence-based recommendations regarding screening for mild thyroid failure and levothyroxine therapy for this condition.

Serum TSH has a log-linear relationship with circulating thyroid hormone levels (a 2-fold change in free thyroxine will produce a 100-fold change in TSH). Thus, serum TSH measurement is the necessary test for diagnosis of mild thyroid failure when the peripheral thyroid hormone levels are within normal laboratory range. The individual range for peripheral thyroid hormones is narrower than the population reference laboratory range; therefore, a slight reduction within the normal range will result in elevation of serum TSH above the normal range.

Most studies on hypothyroidism's long term consequences look at subclinical hypothyroidism because overt hypothyroidism is generally treated. Very few studies have examined the association between hypothyroidism and all-cause mortality. During a population based follow-up study of 599 elderly participants aged 85, subclinical hypothyroidism has been shown to result in better survival than euthyroidism or suppressed thyroid hormone. A large individual participant based meta analysis with over 2500 participants (>80 years) did not confirm this finding.

Several other conditions have been linked to hypothyroidism, including nonalcoholic fatty liver disease, cancer mortality, arthritis, kidney dysfunction, and diabetes, though causality is unclear.

AIMS AND OBJECTIVES

The aim of the present study is

1. To estimate the prevalence of subclinical hypothyroidism above the age of 60 years.
2. To study the relationship of subclinical hypothyroidism to Hypertension, Diabetes and Ischemic Heart Disease in those patients.

MATERIALS AND METHODS

Study Design: cross sectional study

Study Period: 1 year

Study Population: Patients attending General medicine OPD Of Narayana medical college and hospital, Nellore

Setting: Department of General Medicine, Narayana medical college and hospital, Nellore.

Sample Size : 100

Inclusion Criteria :

Patients above the age of 60 years attending Medical outpatient clinic of Narayana Medical College and Hospital, Nellore from January 2022 to January 2023 will be studied.

Exclusion Criteria

1. Known thyroid disease
2. History of neck irradiation.
3. chronic renal failure.
4. severe illness (such as infections, myocardial infarctions, severe heart failure or recent intensive care admission)
5. taking drugs such as amiodarone, lithium, anti thyroid drugs will be excluded.

RESULTS

Table 1: Age distribution

	Frequency	Percentage
61 – 70	34	34%
71 – 80	34	34%
81 – 90	32	32%
Total	100	100%
Mean ± SD	75.37 ± 7.92	

Table 1 shows distribution based on age where mean age of the study participants was 75.37 ± 7.92 years.

Table 2 : Gender distribution

	Frequency	Percentage
Male	51	51%
Female	49	49%
Total	100	100%

Table 3: Diabetes

	Frequency	Percentage
Yes	39	39%
No	61	61%
Total	100	100%

Table 4: Hypertension

	Frequency	Percentage
Yes	42	42%
No	58	58%
Total	100	100%

Table 5: Ischemic Heart Disease

	Frequency	Percentage
Yes	42	42%
No	58	58%
Total	100	100%

Table 6 : TSH levels

	Frequency	Percentage
> 5.5 μ IU/ml	20	20%
< 5.5 μ IU/ml	80	80%
Total	100	100%
Mean $\pm$ SD	4.30 $\pm$ 2.36	

Table 7: Clinical Presentation

	Frequency	Percentage
Fatigue	8	40%
Constipation	8	40%
Weight Gain	7	35%
Goiter	2	10%
Cold intolerance	3	15%

Table 8: Age and TSH levels

	>5.5 μ IU/ml	<5.5 μ IU/ml	Total
61 – 70	6 (30%)	28 (35%)	34 (34%)
71 – 80	7 (35%)	27 (33.75%)	34 (34%)
81 – 90	7 (35%)	25 (31.25%)	32 (32%)
Total	20 (100%)	80 (100%)	100 (100%)

Chi square test= 0.04, p=0.97, Not statistically significant

Table 9: Gender and TSH levels

	>5.5 μ IU/ml	<5.5 μ IU/ml	Total
Male	8 (40%)	43 (53.8%)	51 (51%)
Female	12 (60%)	37 (46.2%)	49 (49%)
Total	20 (100%)	80 (100%)	100 (100%)

Chi square test= 0.01, p=0.004

Table 10: Diabetes and TSH levels

	>5.5 μ IU/ml	<5.5 μ IU/ml	Total
Yes	18 (90%)	21 (26.3%)	39 (39%)
No	2 (10%)	59 (73.8%)	61 (61%)
Total	20 (100%)	80 (100%)	100 (100%)

Chi square test= 27.06, p=0.0001*, Statistically significant

Table 11: Hypertension and TSH levels

	>5.5 μ IU/ml	<5.5 μ IU/ml	Total
Yes	14 (70%)	28 (35%)	42 (42%)
No	6 (30%)	52 (65%)	58 (58%)
Total	20 (100%)	80 (100%)	100 (100%)

Chi square test= 7.96, p=0.004*, Statistically significant

Table 12: Ischemic heart disease and TSH levels

	>5.5 μ IU/ml	<5.5 μ IU/ml	Total
Yes	5 (25%)	10 (12.5%)	15 (15%)

No	15 (75%)	70 (87.5%)	85 (85%)
Total	20 (100%)	80 (100%)	100 (100%)

Chi square test= 1.94, p=0.0016, Statistically significant

DISCUSSION

Subclinical hypothyroidism denotes mild thyroid dysfunction. Its prevalence in general population is around 5 to 15 % of patients. Risk of transformation to true hypothyroidism is 2 to 5 % per year.⁴⁷

The best screening test for any thyroid disorder is measurement of TSH. It is highly a sensitive and specific test. Serum TSH has logrelationship with hormone serum thyroxine, so if serum thyroxine levels doubles there is a hundredfold change in serum TSH levels.

In the present study, the mean TSH levels was 6.10 ± 2.36 . 20% had TSH level >5.5 μ IU/ml. 80% had TSH levels below 5.5 μ IU/ml. This study findings compared to many studies in literature which reported a varied range of prevalence of sub clinical hypothyroidism. This is because many used different cut off to diagnose Sub clinical hypothyroidism. In the study, a cut off value of TSH level >5.5 μ IU/ml was used.

In the present study mean age was 75.37 ± 7.92 years. 34% belong to 61-70 years, 34% in 71-80 years and 32% in 81-90 years. In the TSH >5.5 μ IU/ml group, 35% belong to age group 61-70 years, 35% in 71-80 years, 30% in 81-90 years.

There is no association observed with relation to age and TSH levels as the p value calculated to be >0.05

Majority of the surveys reported a mean age of 65-80 years which is in agreement with our study findings.

CONCLUSIONS

- Prevalence of subclinical hypothyroidism is 20% in the present study, it is highly prevalent in elderly women.
- Symptoms of hypothyroidism are seen in patients with subclinical Hypothyroidism (around 40% in the present study) fatigability, constipation and weight gain are the most common symptoms.
- Subclinical hypothyroidism is significantly related with diabetes and hypertension but not with ischemic heart disease in the present study.

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