



## CROSS SECTIONAL STUDY ON SUBCLINICAL HYPOTHYROIDISM IN ELDERLY FEMALES ABOVE 50 YEARS

### Endocrinology

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### ABSTRACT

**Background:** Subclinical hypothyroidism is defined biochemically as a normal serum free thyroxine (T4) concentration in the presence of an elevated serum thyroid stimulating hormone concentration. It is most often seen in patients with early hashimoto's disease and is a common phenomenon occurring in 7-10% of older women. There is higher prevalence of subclinical hypothyroidism in females than in males and in older patients because of higher prevalence of thyroglobulin and thyroid peroxidase antibodies in women and in elderly people. Several cross sectional studies have suggested an elevated risk for atherosclerosis and coronary heart disease in these patients and hence early identification is fundamental in preventing/decelerating their progression.

#### Objectives

- To estimate prevalence of subclinical hypothyroidism among women above age of 50 years females attending Navodaya Medical College and Research Centre, Raichur.
- To study relation of subclinical hypothyroidism to HTN, Diabetes, and Ischemic heart disease.

**Methodology:** Hospital based cross-sectional study of 100 patients diagnosed by history, clinical examination, necessary investigations like FT3, FT4, TSH, Fasting blood sugar, ECG. Their clinical presentation and etiological diagnosis were profiled at the time of hospital visit. **Results:** Sub clinical hypothyroidism is highly prevalent in elderly women. A prevalence of 11 – 26 % had been reported in previous studies. our study shows a prevalence of 21 % which is in concordance with the other studies. About 65% of the patients with subclinical hypothyroidism had TSH levels < 10µIU/ml. There is a significant increase in IHD in patients with subclinical hypothyroidism compared with controls. There is no increase in incidence of hypertension and diabetes with regard to controls. **Conclusion:** Subclinical hypothyroidism is highly prevalent in elderly women above the age of 50 years. Most of those with subclinical hypothyroidism have TSH level below 10µIU/ml, Patients with subclinical hypothyroidism are more prone to develop ischemic heart disease There is no increased risk for developing hypertension and diabetes mellitus in patients with subclinical hypothyroidism.

### KEYWORDS

Subclinical hypothyroidism, Ischemic heart disease, elderly women

#### INTRODUCTION

Hypothyroidism is more common in older persons than younger individuals, especially among women, principally due to the rising incidence and prevalence of autoimmune thyroiditis.<sup>1</sup> Furthermore, the incidence of hypothyroidism steadily increases with advancing age. Thyroid epithelium undergoes degenerative processes that lead to its flattening, the size of thyroid follicles diminishes, while fibrous connective tissue and lymphoid tissue proliferates. In consequence, the size of the thyroid gland may reduce over time. The ability of the thyroid gland to uptake iodine diminishes.<sup>2</sup>

By definition, subclinical hypothyroidism refers to biochemical evidence of thyroid hormone deficiency in patients who have few or no apparent clinical features of hypothyroidism. The symptoms of subclinical hypothyroidism (serum TSH elevated; fT4 within the normal range) may be very scarce (such as greater tiredness, drier skin, and weight gain) or even absent.<sup>3-6</sup>

The Third National Health and Nutrition Examination Survey (NHANES III) reported that a significantly greater number of women aged above 50 met criteria for subclinical hypothyroidism compared to men in the same age ranges.<sup>7</sup> Another report indicates that approximately 30% of patients with subclinical hypothyroidism had developed overt hypothyroidism after 10 years; the higher the initial TSH, the greater the risk.<sup>8</sup>

Unrecognised thyroid function leads to increased cardiovascular risk, bone fractures, cognitive impairment, depression, mortality. Few longitudinal studies have been conducted. The relationship between subclinical hypothyroidism and cardiovascular disease is therefore controversial and possible outcomes of the conditions remain unclear. Importantly several previous studies suggesting that thyroid autoimmunity is a risk factor for coronary heart disease<sup>9,10,11</sup>

A trial of treatment may be considered when patients have symptoms of hypothyroidism or risk of heart disease. It is important to confirm that any elevation of TSH is sustained over a 3-month period before treatment is given. Treatment is administered by starting with a low dose of LT4 (25–50µg/d) with the goal of normalizing TSH.<sup>13</sup>

There are different studies based on Indian data on several clinical aspects of subclinical hypothyroidism like aetiology, natural history, clinical presentation, treatment recommendations and its effect of public health. But its trend and burden to different morbidity and mortality have never obtained seriousness. Examining the trend of the disease over a time period becomes an important tool to observe the variation of its different aspect and provide the status of country's public health system. Getting the knowledge of exact disease burden of the country can assist in cost effective and optimal use of control measures taken by the government of that country and it also provide the disease scenario particularly in low resource country like India.

#### MATERIAL AND METHODS

**Study Design:** Hospital based cross-sectional study

**Source Of Data:** All elderly women above age of 50 years attending medicine OPD or admitted under the department of General Medicine of Navodaya Medical College Hospital and Research centre, Raichur were the source for data collection for duration of 18 months.

#### Inclusion Criteria

All females above age of 50 years

#### Exclusion Criteria

- Known thyroid disease
- Chronic renal failure
- Severe illness

**Sample Size:** 100

Calculation: P= 11%=0.11

q=1-p= 1-0.11= 0.89

$$Z_{\alpha/2}: 1.96 \text{ at } 95\% \text{ confidence interval}$$

$$e = 7\% = 0.07$$

$$n = \frac{4p(1-p)}{e^2}$$

$$n = \frac{4 \times 0.11 \times 0.89}{(0.07)^2}$$

$$= 79$$

Therefore nearest sample size being 100

**Sampling Procedure**

All female of subclinical hypothyroidism who are all diagnosed by history, clinical examination, necessary investigations like FT3, FT4, TSH, fasting blood sugar, ECG and falling under the inclusion and exclusion criteria were selected.

Their clinical presentation was profiled at the time of hospital visit.

**Statistical Analysis**

Analysis was done using statistical package for social sciences, Chi-square test was used for inferential statistics and p-value of <0.05 was taken as statistically significant.

**RESULTS**

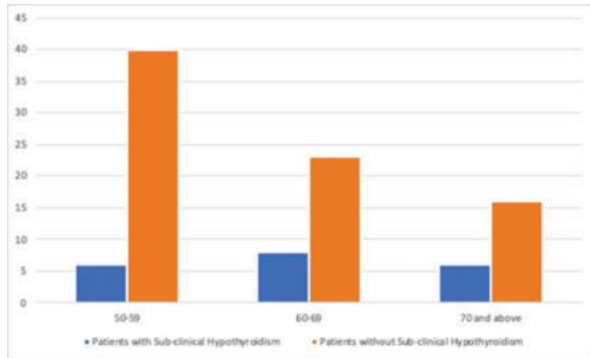
100 elderly women above age of 50 years who visited the outpatient department of General Medicine of Navodaya Medical College Hospital and Research centre during the study period were studied.

21 women were found to have the criteria set for the definition of subclinical hypothyroidism which meant a rate of 21%. Patients with subclinical hypothyroidism were regarded as cases and remaining 79 patients were the control group.

Mean age distribution among cases and controls are shown in table 1 and fig 1

**Table 1**

Age in years	Patients with Sub-clinical Hypothyroidism	Patients without Sub-clinical Hypothyroidism
50-59	6	40
60-69	8	23
70 and above	7	16



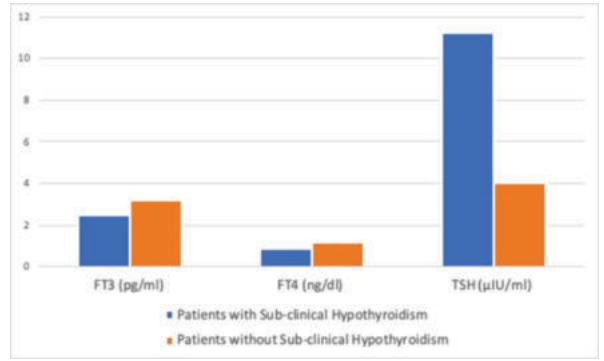
**Figure 1**

There were 46 patients in the age group 50-59 of which 6 (13.04%) were having subclinical hypothyroidism. In the 60-69 age group there were 31 patients of which 8 (25.81%) were having subclinical hypothyroidism. In the 70 and above age group there were 23 patients of which 7 (30.43%) were having subclinical hypothyroidism.

The mean TSH level in patients with subclinical hypothyroidism was 11.2µIU/ml. For FT4 it was 0.9ng/dl and for FT3 it was 2.5pg/ml. There were differences in FT4, FT3, TSH distribution in cases and control as shown in Table 2 and Fig 2

**Table 2**

Mean	Patients with Sub-clinical Hypothyroidism	Patients without Sub-clinical Hypothyroidism
FT3 (pg/ml)	2.5	3.2
FT4 (ng/dl)	0.9	1.2
TSH (µIU/ml)	11.2	4

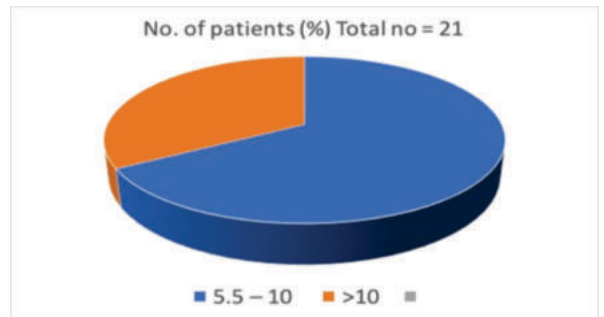


**Figure 2**

There were 21 patients with TSH level more than 5.5 µIU/ml, the upper level of normal range ( 0.30-5.5 µIU/ml). They are the subclinical hypothyroid patients in this study. Of those 21 patients 14(66.67%) had TSH level between 5.5 to 10 µIU/ml. The remaining 7 (33.33%) patients had TSH levels more than 10 µIU/ml as shown in the following Table 3 and Fig 3

**Table 3 TSH Levels In Patients With SH**

TSH level in µIU/ml	No. of patients (%) Total no = 21
5.5 – 10	14
>10	7



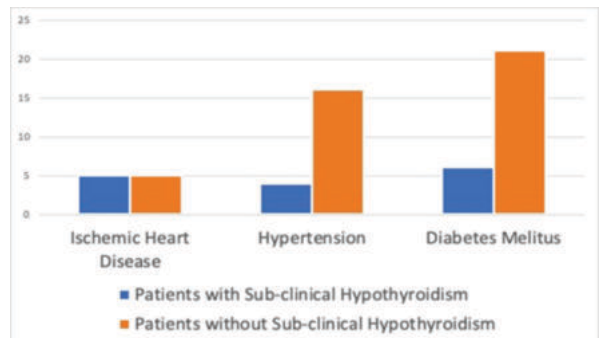
**Figure 3**

The incidence of risk factors like hypertension diabetes and ischemic heart disease were compared between patients with subclinical hypothyroidism and control.

They were analyzed independently with Chi-Square test. The p- value showed that patients with subclinical hypothyroidism were significantly associated with ischemic heart disease compared to controls. The p- value is not significant for hypertension and diabetes. This is shown in table 4

**Table 4**

	Patients with Sub-clinical Hypothyroidism	Patients without Sub-clinical Hypothyroidism	p- value
Ischaemic Heart Disease	5	5	0.047
Hypertension	4	16	0.47
Diabetes Mellitus	6	21	0.5



**Figure 4**

## DISCUSSION

Sub clinical hypothyroidism is highly prevalent in elderly women. A prevalence of 7– 26 % had been reported in previous studies,<sup>12</sup> our study shows a prevalence of 21 %. Almost 66% of our patients with subclinical hypothyroidism had TSH levels < 10 $\mu$ IU/ml.

The present study showed a significant increase in IHD in patients with subclinical hypothyroidism compared with controls (p value of 0.047). subclinical hypothyroidism is associated with dyslipidaemia.

Women with subclinical hypothyroidism did not differ from controls with regard to hypertension and diabetes.

A trial of treatment may be considered when patients have symptoms of hypothyroidism or risk of heart disease. It is important to confirm that any elevation of TSH is sustained over a 3-month period before treatment is given. Treatment is administered by starting with a low dose of LT4 (25–50 $\mu$ g/d) with the goal of normalizing TSH.

## CONCLUSION

Subclinical hypothyroidism is highly prevalent in elderly women above the age of 50 years

Most of those with subclinical hypothyroidism have TSH level below 10 $\mu$ IU/ml. Patients with subclinical hypothyroidism are more prone to develop ischemic heart disease. There is no increased risk for developing hypertension and diabetes mellitus in patients with subclinical hypothyroidism.

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