

## Research Article

# A cross sectional study on subclinical hypothyroidism at tertiary care hospital

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## ABSTRACT

**Objective:** To assess the subclinical hypothyroidism at tertiary care hospital Multan.

### Material and methods:

This cross sectional study was conducted at Department of Medicine, Nishtar Hospital Multan from February 2018 to August 2018 over the period of 6 months. Total number 120 patients (clinically and biochemically established to have hypothyroidism (raised mean TSH over 4.67 $\mu$ IU/mL with normal T3 and T4 levels over period of 3 months, evaluated three times over 3 months) either male or female having age 15-50 years were selected this study.

**Results:** In this study total 120 patients were selected. Mean age of the patient was 33.07 $\pm$ 9.69 years. Total 72 (60%) patients were found with weakness followed by body ache 63 (52.5%), weight gain (56 (46.7%) paresthesia 38 (31.7%), constipation 26 (21.7%), hair fall 22 (18.3%), menstrual disturbance (20 (16.7%), dryness of skin 19 (15.8%), hyperinsomnia 16 (13.3%), memory loss 12 (10%), dyspnea 4 (3.3%) and change in voice in 2 (1.7%) patients. Total 15 (12.5%) patients belonged to age group  $\leq$ 20 years followed by 31 (25.83%) belonged to age group 21-30 years 43 (35.83%) to age group 31-40 years and 31 (25.83%) patients belonged to age group 41-50 years. Out of 120 patients, female patients were 101 (84.17%) and male patients were 19 (15.83%).

**Conclusion:** Results of present study showed that weakness was the highest clinical symptom in cases of subclinical hypothyroidism. Female patients were more victim of subclinical hypothyroidism as compared to male patients. Subclinical hypothyroidism was found most commonly in age group 31-30 years.

**Key words:** Subclinical hypothyroidism, hypothyroidism, TSH, Thyroxine

## INTRODUCTION

Subclinical hypothyroidism (SCH) is a disorder of the thyroid gland characterized by elevated TSH and normal FT3 and FT4. Since clinical presentation is so varied, the only way to diagnose this condition is through biochemical testing. Causes are similar to those of overt

hypothyroidism; most common being chronic autoimmune thyroiditis associated with anti-thyroid peroxidase antibodies (Hashimoto's thyroiditis), whereas others include sub-acute thyroiditis, post-partum thyroiditis, previous hyperthyroidism, in association with other

autoimmune diseases, thyroid injury/inflammation due to radiation, surgery, medication and thyroid infiltration.<sup>1</sup>

The prevalence of SCH is reported to be around 4-10% in the adult population, however this varies with different populations, with more cases occurring in iodine sufficient areas.<sup>2-4</sup> The prevalence is even higher in people taking thyroid medications.<sup>5</sup>

Like other thyroid disorders, SCH is also much more common in women as compared to men and increases with age. Around 2-5% of SCH patients are likely to progress to overt hypothyroidism every year.<sup>6</sup>

The consequences of SCH are variable at several levels and may depend on the duration and the degree of elevation of the serum TSH. Although various studies have suggested it to be a cardiovascular risk factor, yet a number of important questions about SCH remain, including whether it increases cardiovascular (CV) risk or mortality, whether it negatively influences metabolic parameters and whether it should be treated with L-thyroxine. The effect of T4 replacement on lipids is uncertain.<sup>7</sup> However, in several randomized trials of patients with subclinical hypothyroidism treated with T4 versus placebo, serum total and LDL cholesterol and apoprotein B-100 concentrations decreased significantly whereas serum HDL cholesterol, triglyceride, and lipoprotein (a) concentrations did not change.<sup>8</sup>

## MATERIAL AND METHODS

This cross sectional study was conducted at Department of Medicine, Nishtar Hospital Multan from February 2018 to August 2018 over the period of 6 months.

Total number 120 patients (clinically and biochemically established to have hypothyroidism (raised mean TSH over 4.67 $\mu$ IU/mL with normal T3 and T4 levels over period of 3 months, evaluated three times over 3 months) either male

or female having age 15-50 years were selected this study.

Critically ill patients, patients taking irregular medicine thyroid or suffering from other thyroid disorders, pregnant women, patients not willing to participate in the study were excluded from the study. Exclude from the study. This study was approved by the ethical committee and written informed consent was taken from every patient. Five ml blood sample of all the patients was drawn and sent to laboratory for analysis. Findings were noted on pre-designed proforma along with demographic profile of the patients.

All the collected was entered in SPSS version 20 and analyzed. Mean and SD was calculated for numerical data. Frequencies and percentages were calculated for categorical data.

## RESULTS

In this study total 120 patients were selected. Mean age of the patient was 33.07 $\pm$ 9.69 years. Total 72 (60%) patients were found with weakness followed by body ache 63 (52.5%), weight gain (56 (46.7%) paresthesia 38 (31.7%), constipation 26 (21.7%), hair fall 22 (18.3%), menstrual disturbance (20 (16.7%), dryness of skin 19 (15.8%), hyperinsomnia 16 (13.3%), memory loss 12 (10%), dyspnea 4 (3.3%) and change in voice in 2 (1.7%) patients. (Table 1) Selected patients were divided into 4 age groups i.e age group  $\leq$ 20 years, age group 21-30 years, age group 31-40 years and age group 41-50 years. Total 15 (12.5%) patients belonged to age group  $\leq$ 20 years followed by 31 (25.83%) belonged to age group 21-30 years 43 (35.83%) to age group 31-40 years and 31 (25.83%) patients belonged to age group 41-50 years.

(Table 2) Out of 120 patients, female patients were 101 (84.17%) and male patients were 19 (15.83%). (Fig. 2) TSH values ranged from 5.10-17.85mIU/ml with a mean of 8.229mIU/ml.

T3 values ranged from 0.79-1.48ng/dl with a mean value of 1.151ng/dl. Similarly, T4 values ranged from 4.57- 11.85 $\mu$ g/dl (Table 4).

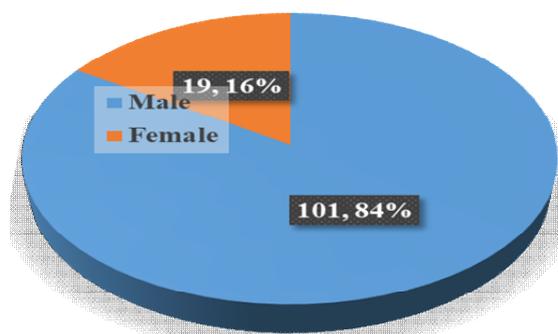
**Table 1:** Clinical profile of the patients

Clinical symptoms	N (%)
Weakness/lethargy/tiredness	72 (60.0%)
body ache	63 (52.5%)
Weight gain	56 (46.7%)
Paresthesia	38 (31.7%)
Constipation	26 (21.7%)
Hair fall	22 (18.3%)
Menstrual disturbance	20 (16.7%)
Dryness of skin	19 (15.8%)
Hyperinsomnia	16 (13.3%)
Memory loss	12 (10.0%)
Dyspnoea	04 (3.3%)
Change in voice	02 (1.7%)

**Table 2: Age distribution**

Age group (years)	N (%)
≤20 years	15 (12.50)
21-30 years	31 (25.83)
31-40 years	43 (35.83)
41-50 years	31 (25.83)

**Fig. 1: Gender of study population.**



**Table 4: Thyroid Profile of the patients.**

Group	No.	Min.	Max.	Median	Mean	SD
Baseline TSH (MIU/ml)	120	5.1	17.85	7.86	8.23	2.47
baseline T3 (NG/DL)	120	0.79	1.48	1.15	1.51	0.19
Baseline T4 (μG/DL)	120	4.57	11.85	8.08	8.16	2.2

## DISCUSSION

The prevalence of SCH in Pakistan has been reported as 13.6% in females and 9.2% in males from a cohort from Karachi, whereas the frequency of this disorder in our hospital based study population was 9.4%.<sup>9</sup> SCH predominantly affected female patients in this cohort, which is

consistent with virtually every major study reported on hypothyroidism prevalence. In a cohort from UK the prevalence of SCH was reported as 7.5% in women and 2.8% in men.<sup>10</sup> The Colorado study found 9% of the population to be subclinically hypothyroid; among subjects taking thyroid medication an even larger percentage (17.6%) were subclinically

hypothyroid.<sup>2</sup> In the National Health and Nutrition Examination Survey (NHANES), a lower prevalence of around 4.3% was seen.<sup>11</sup> Higher levels of TSH were observed with increasing age in this study cohort as reported earlier also.<sup>2</sup>

The clinical manifestations of subclinical hypothyroidism vary from asymptomatic to frank manifestations of hypothyroidism.

Most common manifestation in our study was generalized weakness, lethargy, tiredness (60%) and generalized body ache (52.5%). Other patients complained of weight gain (46.7%), paresthesia, constipation, menstrual disturbance etc. The study clearly shows that the disease is prevalent across all age groups. Our study also indicates that females are more likely to have subclinical hypothyroidism as compare to males. The disease is prevalent more in adolescent females and females of reproductive age group. In our study approximately 61.7% (74/120) of patients belonged to 21-40 years of age. These young females having subclinical hypothyroidism have increased chances of infertility. It is very important to recognize them and treat them with Levothyroxine for their proper growth and development and for future pregnancies.

Owing to these severe health related implications, treatment of hypothyroidism is essential. Levothyroxine is the treatment of choice for hypothyroidism. It has a 7- day half-life, allowing daily dosing.<sup>12</sup> It is also used as a treatment modality in subclinical hypothyroid.

The limitation of the study is that this is a single centered study at tertiary care center, where majority of the patients are referred from other centers.

Thus, this may not represent the holistic prevalence of subclinical hypothyroidism in the society.

However, the findings of this study and earlier studies will promote researchers to do larger and multicentre studies.

## CONCLUSION:

Results of present study showed that weakness was the highest clinical symptom in cases of subclinical hypothyroidism. Female patients were more victim of subclinical hypothyroidism as compared to male patients. Subclinical hypothyroidism was found most commonly in age group 31-30 years.

## REFERENCES

1. Khan MA, Ahsan T, Rehman UL, Jabeen R, Farouq S. Subclinical Hypothyroidism: Frequency, clinical presentations and treatment indications. *Pakistan journal of medical sciences*. 2017 Jul;33(4):818.
2. Canaris GJ, Manowitz NR, Mayor G, Ridgway EC. The Colorado thyroid disease prevalence study. *Arch Intern Med*. 2000;160:526–534.
3. Vanderpump MP, Tunbridge WM, French JM, et al. The incidence of thyroid disorders in the community: a twenty-year follow-up of the *Whickham Survey*. *Clin Endocrinol*. 1995;43:55–68.
4. Szabolcs I, Podoba J, Feldkamp J, Dohán O, Farkas I, Sajgó M, et al. Comparative screening for thyroid disorders in old age in areas of iodine deficiency, long-term iodine prophylaxis and abundant iodine intake. *Clin Endocrinol*. 1997;47(1):87–92.
5. Surks M, Ortiz E, Daniels G, Sawin C, Col N, Cobin R, et al. Subclinical Thyroid Disease. *JAMA*. 2004;291(2):228.
6. Biondi B, Cooper DS. The clinical significance of subclinical thyroid dysfunction. *Endocr Rev*. 2008;29(1):76–131.
7. Mikhail G, Alshammari S, Alenezi M, Mansour M, Khalil N. Increased atherogenic lowdensity lipoprotein cholesterol in untreated subclinical hypothyroidism. *Endocr Pract*. 2008;14:570.
8. Mishra S, Gupta A. Clinical profiling of subclinical hypothyroidism at presentation at tertiary care center. *Int J Res Med Sci* 2019;7:447-50.

9. Alam JM, Mahmood SR, Baig JA, Sultana I. Assessment of sub-clinical hypothyroidism and hyperthyroidism status in adult patients. *Pak J Pharmacol.* 2010;27(1):49–60.
10. Tunbridge W, Evered D, Hall R, Appleton D, Brewis M, Clark F, et al. The spectrum of thyroid disease in a community: The Whickham Survey. *Clin Endocrinol.* 1977;7(6):481–493.
11. Hollowell JG, Staehling NW, Flanders WD, et al. Serum TSH, T 4, and thyroid antibodies in the United States population (1988 to 1994): National Health and Nutrition Examination Survey (NHANES III) *J Clin Endocrinol Metab.* 2002;87:489–499.
12. Roberts CG, Ladenson PW. Hypothyroidism. *Lancet.* 2004;363(9411):793-803.