Clinical Impact of Subclinical Hypothyroidism: Female Preponderance

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ABSTRACT

Objective: The aim of our study was to evaluate the spectrum of clinical presentation in Sub-clinical hypothyroidism (SCH) in Ambala district of Haryana state.

Study design: A Hospital based cross-sectional study was conducted in the Department of Biochemistry, Maharishi Markandeshwar Institute of Medical Sciences and Research (M.M.I.M.S.R), Maharishi Markandeshwar University, Mullana, Ambala over a period of one year.

Participants: 1000 patients in the age group of 20 years & above, were selected from OPD of hospital randomly by simple random sampling method, excluding the known cases of thyroid dysfunction. Data about the patient’s age, sex, and any symptoms was noted down on pre-designed proforma after having informed consent from the patients.

Methodology: Serum was used to estimate T3 and T4 levels by ELISA, Competitive Enzyme Immunoassay method and Serum TSH by ELISA, Immunoenzymometric assay method.

Results: Out of the 1000 cases studied, 120 (12%) had SCH, of which 6 were males (all more than 40 years age) & 114 were females (30 were<45 years & 84 were > 45 years). Of the 120 SCH cases the spectrum of clinical presentation was: lethargy & weight gain in 52, non-specific symptoms in 20, menstrual disturbances in 20, infertility in 16, anxiety & other psychiatric problems in 12. Sub-clinical Hypothyroidism is more common in females than in males and increases with increasing age of females and in post-menopausal females.

Key words: Sub-clinical Hypothyroidism (SCH)
INTRODUCTION

Subclinical hypothyroidism (SCH) represents a condition of mild to moderate thyroid failure, characterised by normal serum levels of thyroid hormones (T3 & T4) with mildly elevated serum Thyroid Stimulating Hormone (TSH) concentration. Subclinical hypothyroidism or mild thyroid failure is a common problem with a prevalence of 3% to 8% in the population without known thyroid disease. The prevalence increases with age and is higher in women. After the sixth decade of life, the prevalence in men approaches that of women, with a combined prevalence of 10%.

The most important implication of SCH is high likelihood of progression to clinical hypothyroidism. Apart from overt hypothyroidism proposed adverse consequences of SCH include, lipid abnormalities, cardiac dysfunction, infertility, adverse fetal defects, neuromuscular dysfunction and psychiatric and cognitive dysfunction.

SCH is being diagnosed more frequently in clinical practice in young & middle aged people as well as in the elderly. However, the clinical significance of SCH is much debated.

Hence, the present study was undertaken to evaluate the percentage of SCH in the population of Ambala District in HARYANA State.

MATERIAL & METHODS

A hospital based cross-sectional study was conducted in the department of Biochemistry, Maharishi Markandeshwar Institute of Medical Sciences and Research (M.M.I.M.S.R), Maharishi Markandeshwar University, Mullana, Ambala, over a period of one year. 1000 Patients in age group of 20 years & above, were selected from OPD of hospital randomly by simple random sampling method, excluding the known cases of thyroid dysfunction. Data about the patient’s age, sex, and any symptoms was noted down on pre-designed proforma with informed consent from the patient. A 5-ml venous blood sample was collected from each patient after an overnight fast. Serum was used to estimate T3 and T4 levels by ELISA, Competitive Enzyme Immunoassay method and Serum TSH by ELISA, Immunoenzymometric assay method as described by Sterling L.

The Normal ranges of serum T3, T4 and TSH were taken as 0.52-1.85 ng/ml, 4.4-11.6 µg/dl and 0.28-6.82 µIU/ml respectively.

RESULTS

• Out of the 1000 cases studied, 120 (12%) had SCH, of which:
  - 6 were males (all more than 40 years age) &
  - 114 were females (30 were<45 years & 84 were > 45 years) (Fig I & II)

• Of the 120 SCH cases the spectrum of clinical presentation was: (Fig III)
  - Lethargy & weight gain : 52
  - Non-specific symptoms : 20
  - Menstrual disturbances : 20
> Infertility : 16
> Anxiety & other psychiatric problems : 12

**Figure I: Sexwise Distribution of Study Group**

![Figure I: Sexwise Distribution of Study Group](image)

**Figure II:**

![Figure II](image)
DISCUSSION

SCH is a condition of mild to moderate thyroid failure characterized by normal serum levels of thyroid hormones with mildly elevated serum TSH concentrations. SCH represents a common disorder with a wide range of prevalence of 3-8%. In the present study, the prevalence of SCH was calculated to be 12%. Among 120 SCH cases, 114 (95%) were females & 6 (5%) were males. The maximum number of patients belonged to 40-55 years with a clear female preponderance. These findings are in accordance with various epidemiological data obtained from large population based studies like The Whickham Survey, NHANES III & The Colorado Thyroid prevalence Study.

The study also shows that the clinical signs & symptoms widely varied among the individuals. 52 (43.3%) patients presented with symptoms of lethargy & weight gain. Similar findings were reported by Kong et al who reported that of women with SCH, the most common hypothyroid symptoms were fatigue (83%) & weight gain (80%). 20 (16.6%) patients presented with symptoms of Menstrual Cycle Disturbances & 16(13.3) presented with infertility whereas another 20 (16.6%) presented with non-specific of general ill-health. Thyroid abnormalities can create menstrual cycle problems, even infertility, in younger women; in perimenopausal women these problems are often exacerbated. Thyroid is related to reproductive hormones in two ways. First, thyroid hormone regulates metabolism & many physiological activities of the body, including reproductive gland activity. Secondly, thyroid hormones have similarities with certain metabolites of estrogen & progesterone & receptor sites for thyroid uptake can be blocked or facilitated by estrogen & progesterone. Imbalances of thyroid hormones T3 & T4, combined with imbalances of estrogen & progesterone can produce many different consequences in the areas of mood, temperature regulation, fluid retention, energy & sleep.
Overt hypothyroidism or SCH can manifest as depression & memory difficulties, in addition to the somatic symptoms of cold intolerance, fatigue & weight gain.\textsuperscript{10} In our study, 12(10%) patients presented with anxiety & other psychiatric problems. This shows that SCH can be a risk factor for depression & other psychiatric problems. Haggerty & colleagues found a nearly threefold higher life time prevalence of depression in young & middle aged women with SCH.\textsuperscript{11}

All these findings suggest that the presence of symptoms in patients with SCH remains controversial. No one symptom of hypothyroidism appears to be the main predictor of subclinical thyroid failure. The presented symptoms are often vague, develop slowly & even go unnoticed. In our opinion, the symptoms of hypothyroidism are probably related to disease severity, disease duration & individual sensitivity to thyroid hormone deficiency, which in turn depends on the sensitivity of the peripheral target organs.

CONCLUSION & RECOMMENDATIONS

Sub-clinical Hypothyroidism is more common in females than in males and increases with increasing age of females and in post-menopausal females. The cases mostly have complaints of lethargy and weight gain. District Ambala (Haryana) comes in Himalayan Goitre Belt & 12% cases were positive for SCH which proves that the rural areas of Haryana are having this problem who can subsequently land up in overt hypothyroidism. Therefore, screening must be done in apparently healthy population especially of females of this belt who are not aware of the problem to overcome the burden and outcome of SCH.

REFERENCES

