



## Original Article

# Prevalence of Subclinical hypothyroidism in females of Jammu region

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## Abstract

Subclinical thyroid disease is defined biochemically by an abnormal thyrotropin (TSH) level and normal serum free thyroxine level. The prevalence of this condition varies according to the reference range for TSH and geographic or demographic factors. Whereas iodine rich diet is necessary for proper thyroid gland function substantial numbers of patients have risk of SCH getting converted into primary hypothyroidism and subclinical hypothyroidism is associated with serious complications. The iodine intake is inversely correlated with thyroid function; deficient iodine intake is related with hyperthyroid status while excessive or sufficient intake of iodine is associated with hypothyroidism.

This study was conducted on 500 people attending the OPD in the Department of Medicine in collaboration with Department of Medicine, at Government Medical College Jammu from January 2017-March 2017. Out of the total, only 102 (20.4%) cases had SCH, with females comprising the majority (79.4%). Patients with TSH >4.3 mIU/ml and T3 and T4 in normal reference range are considered suffering from subclinical hypothyroidism (SCH).

The result clearly reflects the incidence of SCH amongst the demography of the region showing prevalence amongst the elderly and women. Despite all these known facts women still continue to suffer. Subclinical hypothyroidism affects 3-15% of adult population. Its clinical and biochemical profile not well defined, especially in Indian scenario.

**Keywords:** Subclinical hypothyroidism, thyroid stimulating hormone, Iodine.

## Introduction

Thyroid disorders are amongst the most common endocrine disorders in India. The prevalence and pattern of thyroid disorders depends on sex, age, ethnic and geographical factors and especially on iodine intake.<sup>(1)</sup> Subclinical hypothyroidism (SCH) is defined as the clinical status of elevated serum TSH LEVELS (>4.3 TO 10 mU/l) with

normal levels of serum thyroxine (T4) and tri-iodothyronine (T3) and is more common disorder than primary hypothyroidism with prevalence of 1.4- 7.8 % in older populations, prevalence being even greater among women.<sup>(2)</sup> In relation to the prevalence of SCH, the data of the published series ranges considerably between 3.4 and 10.8% of the general population .however, the optimal

TSH cut off values and the clinical significance of these subclinical abnormalities are still controversial.

Elevated or Depressed TSH is associated with nonspecific and non serious symptoms in most cases.<sup>(3)</sup> therefore the clinical impact of this condition should be verified because of high prevalence in the general population; 3% to 12% for subclinical hypothyroidism<sup>(4)</sup> and 1% to 6% for subclinical hypothyroidism.<sup>(5)</sup>

In subclinical hyperthyroidism, treatment tends to be considered when the patient is old or when she or he has a risk of cardiovascular disease<sup>(6)</sup> or osteoporosis<sup>(7)</sup> or a high risk of progression to overt hypothyroidism.<sup>(8)</sup> Therefore prediction of progression to overt thyroid disease is very important for screening or treatment of these condition.

Iodine is an essential dietary element which is required for the synthesis of the thyroid hormones, thyroxine (T4) and tri-iodothyronine (T3), regulates cellular oxidation and hence has effect on calorogenesis, thermogenesis and intermediary metabolism. Daily requirement of iodine is met by well balanced diet and drinking water except in hilly areas and around the rivers and great lakes where iodine has been leached out of soil so that food grown in soil is iodine deficient, resulting in increased incidence of hypothyroidism in in these deficient areas . The regions with heavy rainfall or snowfall are particularly likely to be iodine deficient as tthe superficial layer of soil (in which iodine is present) is washed away. In these areas, 60-75% of the iodine needs are met by the iodine present in the diet and rest through the iodine content of water. The food grown in iodine deficient regions can never provide enough iodine to the population and livestock living there.<sup>(9)</sup>

Nowadays about 800 million people are affected by iodine deficiency disorders that include goitre, hypothyroidism, mental retardation, and wide spectrum of other growth and developmental abnormalities. Iodine supplementation, under form iodide salt and iodized vegetable oil, produces dramatic improvements in many areas,

even though iodine deficiency is still a problem not only for developing countries. In fact, certain subpopulations like vegetarians may not have an adequate iodine intake even in countries considered as iodine sufficient.<sup>(10)</sup> Furthermore, iodine intakes are declining in many countries where, after endemic goitre eradication, the lack of monitoring of iodine nutrition can lead to reappearance of goitre and other iodine deficiency disorders. In the mountainous or hill lock region like Kashmir valley, and upper reaches of Jammu region, where soil is deficient in iodine material, iodized salt, which is made by the addition of small amounts of iodine to the tablet salts in the form of sodium iodide, potassium iodide, which should be given to the people and the suspected patients of thyroid disorders .this helps to combat the iodine deficiency which causes goitre, hypothyroidism, etc. Yogurt, cow's milk, strawberries, nuts, fishes and dairy products are good sources.<sup>(11)</sup> Due to apparently asymptomatic nature of the illness, the American Thyroid association (ATA) has recommended routine population screening of both genders at the age of 35 years and then every 5 years thereafter for early detection and treatment of subclinical hypothyroidism. There is a paucity of Indian data on prevalence, clinical profile, biochemical profile and therapy of this condition. There are no Indian guidelines for screening of high risk population for subclinical hypothyroidism. The aim of this study is to investigate the percentage of subclinical hypothyroidism and awareness regarding the role dietary iodine and iodized salt in proper thyroid functioning in study sample comprising of patients, from ethnic population of rural Jammu.

### **Material and Method**

The study was conducted on 500 people attending the OPD in the Department of Medicine in collaboration with Department of Biochemistry, from January 2017-March 2017. Patients with ischaemic heart disease, Cerebrovascular disease, diabetes mellitus, chronic renal failure, known

psychological illness, previous history of thyroid disorder or previous thyroxine therapy, pregnancy were excluded. All patients referred from outpatient and inpatient department were assessed for the evaluation of thyroid function. Whole blood was analyzed via automated chemiluminescent microparticle immunoassay (cmiatechnology, ARCHITECT TSH assay).<sup>(12)</sup>

**Table 1:** Hypothyroid prevalence within population

Clinical Diagnosis	Females	Males	Total (%)
Euthyroid	169	181	350 (70)
Subclinical hypothyroid	81	21	102 (20.4)
Primary Hypothyroid	32	16	48 (9.6)
Total (%)	282 (56.4)	218 (43.6)	500 (100)

TSH value above 4.3 mIU/ml and free T4 within normal range, was the designated criteria for SCH. It means that patients with TSH >4.3 mIU/ml and T3 and T4 in normal reference range are

## Results

Out of the total Cases studied (n=500), 218 were males and 282 females. Thus females constituted 56.4% of sample size. Among them 102 (20.4%) cases had SCH. Out of these 102 cases, females accounted for 79.4%. (Table 1)

considered suffering from subclinical hypothyroidism (SCH). Total euthyroid was reported in 48 (9.6%) cases and total primary hypothyroid was reported in 350 (70%) cases. (Table 1,2)

**Table 2:** Classification of patient status based upon serum thyroid hormone levels

Status	Serum Hormone Levels: Mean±SD		
	T3	T4	TSH
Reference range	0.8 - 2.1 ng/ml	5.0 - 14.1 µg/ml	0.2 - 4.3 mIU/ml
Euthyroid (n= 350)	1.11 ± 0.14	7.29 ± 1.58	2.59 ± 0.76
Subclinical Hypothyroid (n=102)	1.57 ± 0.25	6.88 ± 1.92	16.23 ± 9.93
Primary Hypothyroid (n= 48)	1.73 ± 0.44	5.25 ± 1.74	18.83 ± 10.33

## Discussion

Subclinical Hypothyroidism is the most prevalent thyroid disorder affecting 3-15% of the adult population.<sup>(13)</sup> Its incidence increases with advanced age and female gender.<sup>(14)</sup> In the present case, we studied 500 subjects, among them 102 had subclinical hypothyroidism which is much higher as compared to the prevalence found in other epidemiological studies from various parts of the world. Also, the females suffering from SCH accounted for 79.4% of the total SCH cases. The result of the present study showing high prevalence of SCH among females is in agreement with the data across the globe. The ratio clearly reflects the incidence of SCH amongst the demography of the region but for a clearer picture, extreme epidemiological study is mandated.

## Conclusion

Subclinical thyroid disease is defined by the reference of TSH. The significance of various aspects of this disease is now widely studied, and the data continues to be accumulated. In summary, subclinical thyroid disease is more prevalent in the elderly and in women. Despite all these known facts about thyroid dysfunction problems, women still continue to suffer. A prevalence rate of 20.4% was found among the study groups which is quite high as compared to other epidemiological studies in various parts of the world. The iodine intake is inversely correlated with thyroid function; deficient iodine intake is related with hyperthyroid status while excessive (or sufficient) intake of iodine is associated with hypothyroidism. Screening studies to assess thyroid disorder prevalence have often provided valuable insights in understanding the epidemiology of all thyroid

disorder in the population worldwide. There is a risk in prevalence of all the thyroid disorder including subclinical hypothyroidism in India, however screening studies have been a rarity here and there is scanty literature on prevalence of these disorders in all the regions of India. Further community level awareness programme is needed to be organized, where people should be motivated about screening of subclinical hypothyroidism.

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