

## Research Article

# Prevalence of hypothyroidism in adults by screening TSH: a study from North India

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## ABSTRACT

**Background:** Hypothyroidism is a common endocrinological problem worldwide. There are no sufficient studies on the prevalence of hypothyroidism in different geographical territories of India. The present study is a cross sectional study to determine the prevalence of hypothyroidism in adults in north India.

**Methods:** A total of 300 asymptomatic individuals of both sexes attending OPD of a tertiary health care centre and their willing attendants of the age group of 15 to 50 years were included in the study. TSH screening was performed on all of them and results obtained were analysed.

**Results:** A total of 66 participants were detected hypothyroidism (subclinical as well as overt). Subclinical hypothyroidism was the commonest entity encountered, females affected more than males.

**Conclusions:** Subclinical as well as overt hypothyroidisms are significantly common in this part of the world. Screening TSH should be done in patients presenting with undiagnosed fatigue and weight gain.

**Keywords:** Subclinical hypothyroidism, North India

## INTRODUCTION

Hypothyroidism is a common endocrinological problem worldwide. The global burden of hypothyroidism is significant. The prevalence of hypothyroidism in the developed world is about 4-5%.<sup>1,2</sup> The prevalence of subclinical hypothyroidism in the developed world is about 4-15%.<sup>1,3</sup>

In India, hypothyroidism is similarly as common. Iodine deficiency was considered to be the commonest cause of goitre and hypothyroidism in India. Ever since India adopted the universal salt iodization program in 1983, there has been a decline in goiter prevalence in several parts of the country, which were previously endemic.<sup>4-7</sup> Subclinical hypothyroidism is the most common thyroid disorder in adults, being more common in females, elderly age and its incidence increases with greater iodine intake.<sup>8-11</sup> Due to asymptomatic nature of subclinical

hypothyroidism, American Thyroid Association has recommended routine TSH screening at the age of 35 for both sexes and every 5 years thereafter. Till now, there no similar guidelines in India for TSH screening. There are no sufficient studies on the prevalence of hypothyroidism in different geographical territories of India. The present study is a cross sectional study to determine the prevalence of hypothyroidism in adults in north India.

## METHODS

A total of 300 asymptomatic individuals of both sexes attending OPD of a tertiary health care centre and their willing attendants of the age group of 15 to 50 years were included in the study. All of the participants were randomly selected. After detailed history taking and physical examination, thyroid screening TSH test was performed on all of them and results obtained were analysed.

**Inclusion criteria**

1. Adults in the age group of 15 to 50 years.
2. Willing to participate in the study.

**Exclusion criteria**

1. Age less than 15 or more than 50 years.
2. Pregnant females.
3. Family history of thyroid disorder.
4. Patient suffering from acute or chronic systemic illness.
5. Patient taking steroids, lithium or other drugs which can interfere with thyroid function tests.

Detailed history of any chronic illness in past was obtained as well as history of drug intake (e.g. Steroids, lithium, oral contraceptives or other hormonal therapy) was obtained. Detailed clinical examination was done to exclude any chronic or acute systemic illness. Lab investigations including biochemical parameters (e.g. CBC, FBS, Renal function tests, liver function tests, serum proteins, serum albumin, electrolytes etc.) were done where deemed necessary.

**RESULTS****Table 1: Age wise distribution of the participants.**

Age group (in years)	Male	Females	Total
15-25	26	60	86
26-35	53	26	79
36-45	50	42	92
46-50	21	22	43
Total	150	150	300

A total of 300 individuals of both sexes of the age group of 15-50 years were selected, from the OPD patients coming to hospital for illness unrelated to thyroid disease or their willing attendants, for the study after following the inclusion and exclusion criteria. Out of these 150 were males and 150 were females. The age wise distribution of the participants is as shown in Table 1.

TSH was measured of all the participants from the same laboratory. A reference range of 0.5-5.5 was considered as normal.

**Hyperthyroidism**

Out of the 300 participants, 5 were detected to be having hyperthyroidism, 2 male (1.3%) and 3 female (2%).

**Table 2: Prevalance of subclinical and overt hypothyroidism in study group.**

Males (n=150)		Females (n=150)	
Subclinical hypo-thyroidism	Overt hypo-thyroidism	Subclinical hypo-thyroidism	Overt hypo-thyroidism
19	7	29	11
12.66%	4.66%	19.33%	7.33%

**Hypothyroidism**

A total of 66 participants were detected hypothyroidism (subclinical as well as overt). Out of 66, 40 were females and 26 were males. Hypothyroidism was found to be more common in females than males (26.6% in females' vs 17.3% in males) (Table 2).

**Table 3: Age and gender wise comparison of prevalence of subclinical and overt hypothyroidism in study group.**

Age group (In years)	Male(n=150)				Females(n=150)				Total(n=300)			
	Subclinical	%	Overt	%	Subclinical	%	Overt	%	Subclinical	%	Overt	%
15-25	4(n=26)	15.3	2(n=26)	7.7	13(n=60)	21.6	3(n=60)	5	17(n=86)	19.7	5(n=86)	5.8
26-35	7(n=53)	13.2	2(n=53)	3.77	5(n=26)	19.2	2(n=26)	7.7	12(n=79)	15.1	4(n=79)	5.06
36-45	5(n=50)	10	2(n=50)	4	8(n=42)	19.04	4(n=42)	9.52	13(n=92)	14.1	6(n=92)	6.52
46-50	3(n=21)	14.2	1(n=21)	4.76	3(n=22)	13.6	2(n=22)	9.09	6(n=43)	13.9	3(n=43)	6.97
Total	19	12.6	7	4.66	29	19.3	11	7.33	48	16	18	6

**Subclinical hypothyroidism:** Subclinical hypothyroidism was the commonest entity encountered in 48 (16%) of participants (19.3% females and 12.6% males) (Table 2). Subclinical hypothyroidism was found to be more common in younger age group in both genders (Table 3).

**Overt hypothyroidism:** Overt hypothyroidism was detected in 18 individuals, 11 females (7.3%) and 7 males (4.6%) (Table 2). The mean TSH was also calculated in the study group. The mean TSH of the study group was

4.87. The mean TSH was higher in females than males (4.53 in females' vs 4.21 in males).

**DISCUSSION**

Hypothyroidism is a common endocrine disorder worldwide as well as in India. The clinical manifestations of hypothyroidism are varied including weight gain, cold intolerance, menstrual irregularities, lethargy, fatigue etc. The clinical spectrum of hypothyroidism varies from

asymptomatic subclinical hypothyroidism through overt hypothyroidism to life threatening myxoedema coma.

In the recent study, subclinical hypothyroidism has been found to be significantly prevalent in this part of the world. Females are more affected than males. Prevalence of subclinical hypothyroidism has been found to be more common in younger age group (Table 3), which is in contradiction to the previous studies where subclinical has been found to be more common with advancing age.<sup>12,13</sup>

In the recent study overt hypothyroidism has been found to be more common in females than males, prevalence increasing with aging in males as well females (Table 3).

## CONCLUSIONS

Hypothyroidism is a significant health problem worldwide as well as in India. Our study gives an idea of prevalence of this entity in north India. Subclinical as well as overt hypothyroidisms are significantly common in this part of the world. Subclinical hypothyroidism is more common especially in females, usually presenting as vague manifestations. Common presenting complaint being fatigue, body aches, weight gain, constipation, menstrual irregularities, and sometimes infertility. So, any subject presenting with undiagnosed fatigue, weight gain and menstrual irregularities should be subjected to TSH screening.

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## REFERENCES

- Hollowell JG, Staehling NW, Flanders WD, Hannon WH, Gunter EW, Spencer CA, 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;87:489-99.
- Hoogendoorn EH, Hermus AR, de Vegt F, Ross HA, Verbeek AL, Kiemency LA, et al. Thyroid function and prevalence of anti-thyroperoxidase antibodies in a population with borderline sufficient iodine intake: Influences of age and sex. Clin Chem. 2006;52:104-11.
- Bemben DA, Hamm RM, Morgan L, Winn P, Davis A, Barton E. Thyroid disease in the elderly. Part 2. Predictability of subclinical hypothyroidism. J Fam Pract. 1994;38:583-8.
- Tiwari BK, Ray I, Malhotra RL. New Delhi: Government of India; 2006. Policy Guidelines on National Iodine Deficiency Disorders Control Programme-Nutrition and IDD Cell. Directorate of Health Services, Ministry of Health and Family Welfare. pp. 1-22.
- Toteja GS, Singh P, Dhillon BS, Saxena BN. Iodine deficiency disorders in 15 districts of India. Indian J Pediatr. 2004;71:25-8.
- Marwaha RK, Tandon N, Gupta N, Karak AK, Verma K, Kochupillai N. Residual goitre in the postiodization phase: Iodine status, thiocyanate exposure and autoimmunity. Clin Endocrinol. 2003;59:672-81.
- Kapil U, Sharma TD, Singh P. Iodine status and goiter prevalence after 40 years of salt iodisation in the Kangra District, India. Indian J Pediatr. 2007;74:135-7.
- Sawin CT, Castelli WP, Hershman JM, McNamara P, Bacharach P. The aging thyroid. Thyroid deficiency in Farmingham study. Arch Intern Med. 1985;145:1396-88.
- Vanderpump MP, Tunbridge WM, French JM, Appleton D, Bates D, Clark F, et al. The incidence of thyroid disorders in community. A 20 year follow up of the Wickham survey. Clin Endocrinol. 1995;43:55-68.
- Konno N, Makita H, Yuri K, Iizuka N, Kawasaki K. Association between dietary iodine intake and prevalence of Subclinical Hypothyroidism in coastal regions of Japan. J Clin Endocrinol Metab. 1994;78:393-7.
- Szavolcs I, Podoba J, Feldkamp J, Dohan O, Farkas I, Sajgó M, et al. Comparative screening for thyroid disorders in old age in areas of iodine deficiency, long term iodine deficiency, long term iodine prophylaxis and abundant iodine intake. Clin Endocrinol. 1997;47:87-92.
- Tunbridge WM, Evered DC, Hall R, Appleton D, Brewis M, Clark F, et al. The spectrum of thyroid disease in a community. The Wickham survey. Clin Endocrinol. 1977;7:481-93.
- Parle JV, Franklyn JA, Cross KW, Jones SC, Sheppard MC. Prevalence and follow up of abnormal thyrotropin (TSH) concentration in the elderly in the United Kingdom. Clin Endocrinol. 1991;34:77-83.

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