

COMPARISON OF PREVALENCE OF SUBCLINICAL HYPOTHYROIDISM IN URBAN AND RURAL POPULATION OF NORTHERN INDIA

Biochemistry

Sunil Kumar*

Department of Biochemistry, National Institute of Medical Sciences and Research, Jaipur. *Corresponding Author

R C Gupta

Department of Biochemistry, National Institute of Medical Sciences and Research, Jaipur.

ABSTRACT

Introduction: Subclinical hypothyroidism (SCH) is defined as high serum TSH concentration with normal Free Thyroxine (FT₄) and Free Triiodothyronine (FT₃) concentrations, associated with few or no signs and symptoms of hypothyroidism. It is reported to have a prevalence of 4-10% in general population and 7-26% in geriatric population. There are very few reports on prevalence of subclinical hypothyroidism in the general population of India, especially rural population.

Material and Methods: This cross-sectional study was conducted on 400 subjects from rural areas (areas under Gram Panchayat) and 400 subjects from urban areas (areas under Municipal Corporation or Municipal Committee) in Amber Tehsil of Jaipur District. Serum specimens of all the subjects were analyzed for FT₃, FT₄ and TSH by chemiluminescence. Prevalence of SCH in urban and rural areas was compared by Chi square test. $P < 0.05$ was taken as significant.

Results: Serum TSH was found to be above normal in 9.75% (N=39) of the urban subjects and 10.75% (N=43) of the rural subjects. The concentration of serum FT₃ and FT₄ was normal in all the urban and rural subjects. The difference in prevalence of subclinical hypothyroidism in urban and rural areas was not significant. The proportion of subjects having high TSH was more in women than in men in urban as well as rural populations but the difference was not significant.

Conclusion: The prevalence of subclinical hypothyroidism was 9.75% in urban and 10.75% in rural population of Northern India. The difference in urban and rural prevalence was not significant.

KEYWORDS

INTRODUCTION:

The prevalence of hypothyroidism in the developed world is reported to be 4-5%.^[1,2] In India, a recent study was done on prevalence of hypothyroidism in Cochin on 971 adult subjects, where the prevalence was found to be 3.9%.^[3] Subclinical hypothyroidism can be defined as high serum TSH concentration with normal Free Thyroxine (FT₄) and Free Triiodothyronine (FT₃) concentration, associated with few or no signs and symptoms of hypothyroidism.^[4] It is reported to be a common thyroid disorder affecting 3-15% of the adult population.^[5] Subclinical hypothyroidism has been reported to have prevalence of 4-10% in general population and 7-26% in geriatric population in one study.^[6] Prevalence of subclinical hypothyroidism in women above 60 years is reported to be 4-8.5%.^[7]

After a thorough literature search, we could find no report on prevalence of subclinical hypothyroidism in Northern India and on comparison of prevalence in urban and rural populations. Therefore, this study was planned to find out the prevalence of subclinical hypothyroidism in the Northern part of India and to compare the prevalence in urban and rural populations.

MATERIAL AND METHODS:

This cross-sectional study was conducted on 400 subjects from rural areas (areas under Gram Panchayat) and 400 subjects from urban areas (areas under Municipal Corporation or Municipal Committee) in Amber Tehsil of Jaipur District.

Sample selection:

Simple randomization method was used for the selection of subjects. Every fiftieth house was selected in the defined urban and rural areas. If total houses in a village were less than 50, then any one house was selected randomly.

Laboratory analysis:

Five ml venous blood was collected from each subject in plain vial from antecubital vein under aseptic conditions after 12 hours of fasting. The blood was centrifuged at 4,000 rpm for 5 minutes and the serum removed and stored at -20°C. The serum specimens were analyzed in National Institute of Medical Sciences and Research, Jaipur. The following were estimated in serum by chemiluminescence commercial kits:

1. Free triiodothyronine (FT₃)^[8]
2. Free thyroxine (FT₄)^[9]

3. Thyroid Stimulating Hormone (TSH)^[10]

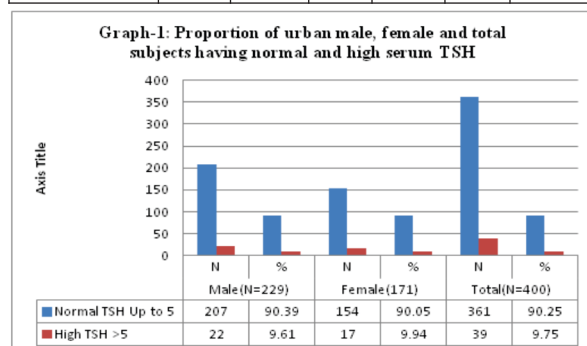
Statistical analysis was done by Chi square test.

RESULTS:

Serum TSH was found to be above normal in 9.61% (N=22) of the male subjects and 9.94% (N=17) of the female subjects in the urban area. The proportion of subjects having high TSH was more in females than in males. When all the urban subjects of both the sexes were taken together, serum TSH was found to be above normal in 9.75% (N=39) of the subjects (Table 1). The concentration of serum FT₃ and FT₄ was normal in all the subjects.

Table 1: Proportion of male and female subjects in urban area having normal and high serum TSH (serum FT₃ and FT₄ were normal in all the subjects)

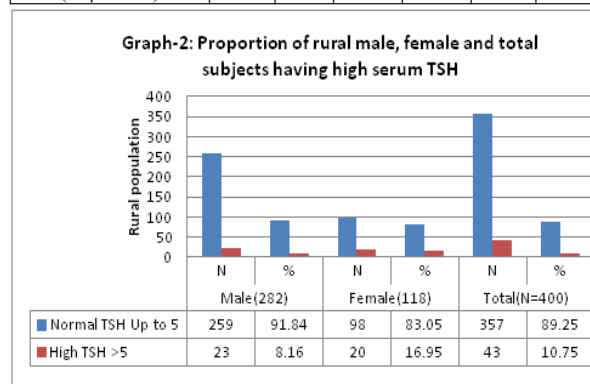
	Male (N=229)		Female (171)		Total (N=400)	
	N	%	N	%	N	%
Normal TSH (up to 5 μ IU/ml)	207	90.39	154	90.05	361	90.25
High TSH (>5 μ IU/ml)	22	9.61	17	9.94	39	9.75



Serum TSH was found to be above normal in 8.16% (N=23) of the male subjects and 16.95% (N=20) of the female subjects in the rural area. The proportion of subjects having high TSH was more in females than in males. Among all rural subjects of both the sexes, serum TSH was high in 10.75% (N=43) of the subjects (Table 2). The concentration of serum FT₃ and FT₄ was normal in all the subjects.

Table 2: Proportion of male and female subjects in rural area having normal and higher serum TSH (serum FT3 and FT4 were normal in all the subjects)

	Male(282)		Female(118)		Total(N=400)	
	N	%	N	%	N	%
NormalTSH (upto5μIU/ml)	259	91.84	98	83.05	357	89.25
HighTSH (>5μIU/ml)	23	8.16	20	16.95	43	10.75



The overall prevalence of SCH in the total study sample was 10.25% (82 subjects out of 800). When the prevalence of SCH in all the subjects of urban area and all the subjects of rural area was compared, the difference was statistically non-significant (Table 3).

Table 3: Comparison the prevalence of SCH in urban and rural population

Population	Subclinical hypothyroidism (SCH)		χ^2	P Value
	N	%		
Urban(N=400)	39	9.75	0.2174	0.64(NS)
Rural(N=400)	43	10.75		

DISCUSSION:

The prevalence of subclinical hypothyroid (SCH) was found to be 9.75% in urban area and 10.75% in rural area of Jaipur. The urban-rural difference was not significant. In a study on general adult population in Kerala, the prevalence of SCH was found to be 9.4% but this study was done in an urban area and hence there is no mention of urban-rural comparison.^[11] In a study from Andhra Pradesh, a prevalence of 8.29% has been reported but this study was conducted on people coming to the hospital for check-up, and the urban-rural difference was not investigated.^[12] Prevalence of subclinical hypothyroidism was found to be 11.3% in a study from Mumbai but this study was conducted on hospital personnel rather than general population and urban-rural difference was not explored.^[13]

Screening studies have been a rarity in India and there is scanty literature on prevalence of SCH in different regions of India. Our study shows that SCH is a fairly prevalent thyroid disorder in Northern India with no urban-rural difference.

CONCLUSION:

The prevalence of subclinical hypothyroidism was 9.75% in urban and 10.75% in rural population of Northern India. The prevalence in urban and rural populations was similar.

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