

Prevalence of Thyroid Dysfunction in a Tertiary Care Hospital: A Retrospective Study

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Conflict of interest: Nil

Abstract

Background: Thyroid dysfunction is one of the most common endocrine disorders worldwide, with hypothyroidism being more prevalent than hyperthyroidism. Subclinical thyroid disorders may remain clinically asymptomatic despite biochemical abnormalities and can progress to overt disease. This study aimed to estimate the prevalence of thyroid dysfunction and differentiate subclinical and overt thyroid disorders in a tertiary care hospital.

Methodology: A hospital-based retrospective study was conducted in the Department of Biochemistry, Acharya Shri Chander College of Medical Sciences & Hospital, Sidhra, Jammu on 906 subjects aged ≥ 18 years who underwent thyroid function testing and Serum TSH, T₃, and T₄ were analysed using chemiluminescence immunoassay (CLIA). Data were analysed using descriptive statistics.

Results: Among 906 subjects, 67.66% were females and 32.34% were males. Thyroid dysfunction was observed in 34.21% of the study population. Hypothyroidism accounted for 30.46%, while hyperthyroidism accounted for 3.75%. Of the hypothyroid subjects, 74.64% had subclinical and 25.36% had overt hypothyroidism. Among hyperthyroid subjects, 61.76% had subclinical and 38.24% had overt hyperthyroidism.

Discussion: The findings demonstrate a considerable burden of thyroid dysfunction, with females more frequently affected and subclinical hypothyroidism constituting the predominant one. These findings were consistent with the previous studies.

Conclusion: Hypothyroidism, particularly its subclinical form, was highly prevalent. Targeted screening and early biochemical detection might facilitate timely management and improved the clinical outcomes.

Keywords: Thyroid dysfunction; Hypothyroidism; Hyperthyroidism; Subclinical hypothyroidism; Thyroid function test; TSH.

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Introduction

The thyroid is an endocrine gland situated beneath the cricoid cartilage. It is a butterfly-shaped organ which has two lobes which is made up of follicular and parafollicular cells. The follicular cells secrete T₃ and T₄ hormones. The parafollicular cells secrete calcitonin hormone. The weight of the thyroid gland is 18–60 grams. It increases the metabolism of carbohydrates, proteins, and lipids and control the activity of other hormones like insulin and glucocorticoids. It also increases oxygen consumption, heat production and increase cardiac activity.

It also affects the function of the kidney, liver, and muscle. Moreover, also increase the production of growth hormone and potentiate its effects. It is important for skeletal development and essential

for normal growth and maturation of the CNS. Thyroid disorders are among the most common endocrine diseases, nearly as frequent as diabetes. This disease is taking a toll with about 200 million people getting affected world-wide [1] which is estimated to be 40 % of world population and 42 million people suffer from thyroid diseases in India.[2]

While prevalence of Thyroid disease in India is high in hilly and iodine deficient regions and increasing however there is considerable heterogeneity across the different states and reason for this high heterogeneity amongst the state are many such as geographical region (coastal and plains), variation in lifestyle factor (Rural vs Urban) and different states of socio-economic

development (Rich state vs Poor state) [3]. In India Thyroid disorder patients differ from western patients in many aspects.[4] Hypothyroidism is more common than hyperthyroidism. Rate of progression of subclinical Hypothyroidism to Overt Hypothyroidism is high in India [5]. The screening of subclinical hypothyroidism is important during pregnancy ,infertility cases and screening of subclinical Hyperthyroidism is important especially in elderly peoples with risk of Osteoporosis and cardiovascular disorder and their progression to overt thyroid disorders in both the cases.[6,7,8] Henceforth, the screening and follow up of subclinical patients of thyroid is very important especially the progression to overt thyroid disorders to reduce the clinical impact of these conditions[9,10,11,12,13].Early diagnosis and treatment remain the cornerstone of the management. T3 and T4 are synthesized due to TSH stimulation from the anterior pituitary. Subclinical thyroid disorder whether hyperthyroid or Hypothyroid presented as normal thyroid hormones T3 and T4 levels but de-arranged TSH levels without apparent symptoms[14].The patients with abnormal TSH levels maybe associated with various metabolic syndromes such as cardiovascular risk, cognitive impairment, polycystic metabolic ovarian syndrome[15,16,17,18,19].

Aims & Objectives

- To estimate the proportion of patients with thyroid dysfunction in a tertiary care hospital.
- To differentiate the prevalence of subclinical and overt thyroid disorders based on biochemical criteria.

Materials & Methods

This hospital-based retrospective study was conducted in the Department of Biochemistry, ASCOMS Hospital. A total of 906 subjects who underwent thyroid function testing (TFT) were included in the study.

Serum levels of thyroid-stimulating hormone (TSH), triiodothyronine (T₃), and thyroxine (T₄) were analyzed using the chemiluminescence immunoassay (CLIA) method (Roche411).

Inclusion Criteria: Male and female patients aged 18 years and above who underwent thyroid function testing during the study period.

Exclusion Criteria: Pregnant women and children (<18 years) were excluded from the study.

Normal Ranges— TSH = 0.27-4.20 mIU/L T₄ = 66.0-181.0 mcg/dL

Statistical Analysis: Data were compiled and analysed using Microsoft Excel SPSS software. Descriptive statistics were used to calculate the prevalence and distribution of thyroid dysfunction across different categories.

Based on the biochemical parameters, patients were categorized as

Patient Category	Hypothyroidism		Hyperthyroidism	
	Overt	Subclinical	Overt	Subclinical
TSH (mIU/L)	> 4.20	> 4.20	< 0.27	< 0.27
T4 (mcg/dL)	< 66.0	Normal	> 181.0	Normal

Results

Table 1: Gender wise distribution of patients

Gender	No. of patients	Percentage (%)
Female	613	67.66
Male	293	32.34
Total	906	100

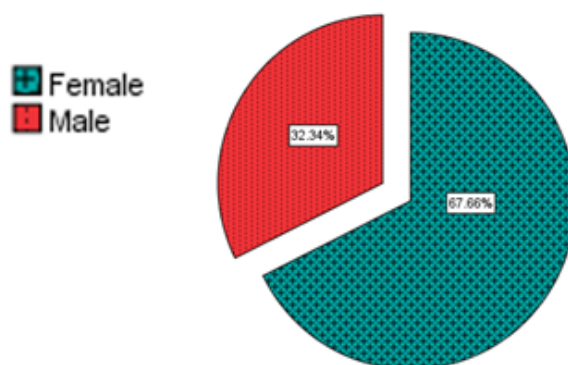
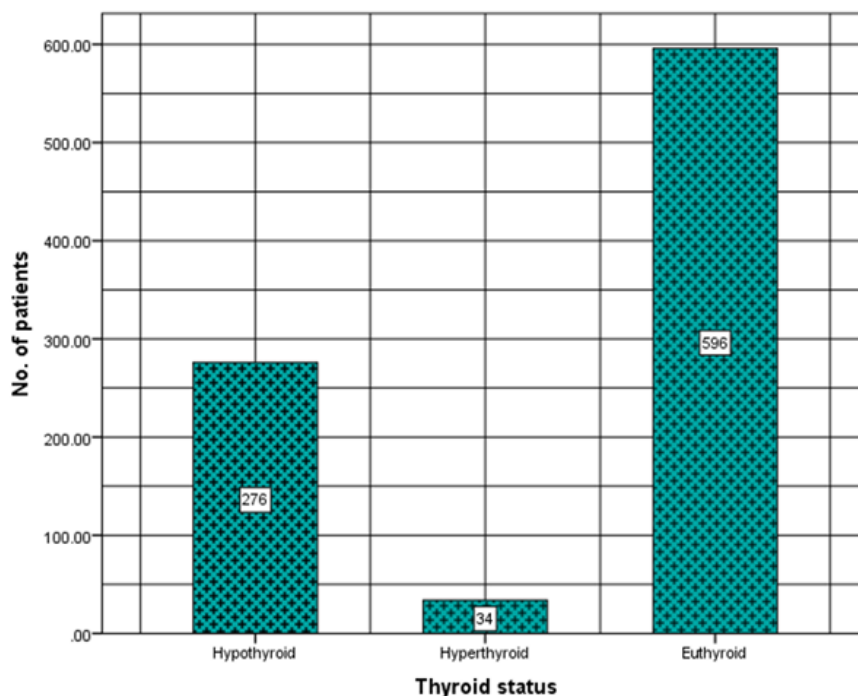


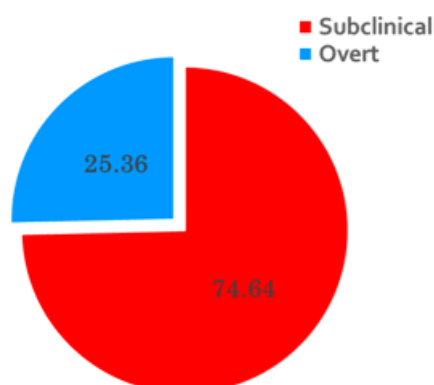
Figure 1:

Table 2: Thyroid Status of Patients

Thyroid Status	No. of Patients	Percentage (%)
Hypothyroid	276	30.46
Hyperthyroid	34	3.75
Euthyroid	596	65.78
Total	906	100

**Figure 2:****Table 3: Categorization of Hypothyroid subjects**

Hypothyroid status	No. of patients	Percentage (%)
Overt	70	25.36
Sub clinical	206	74.64
Total	276	100

**Figure 3:****Table 4: Categorization of Hyperthyroid subjects**

Hyperthyroid status	No. of patients	Percentage (%)
Overt	13	38.24
Sub clinical	21	61.76
Total	34	100

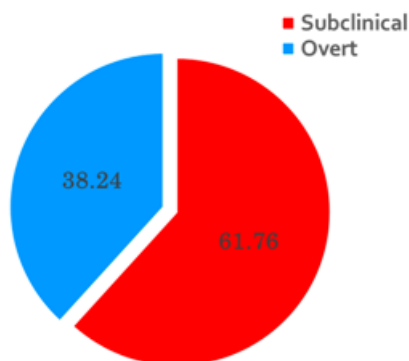


Figure 4:

Discussion

Thyroid disorders are one of the commonest endocrine dysfunctions worldwide. In India, hypothyroidism cases are much more in number as compared to other thyroid disorders. In our study females were more affected as compared to males which was correlating with the study done by Khan A et al [20] revealed that female is the predominant gender and may be attributed to metabolic, nutritional deficiencies and stress related disorders. The present study showed the euthyroid cases outnumbered the patients of hypothyroid and hyperthyroid which was compatible with the previous study done by Athab et al [21] in 2014 and the study done by Tahir NT et al [22] in 2020 suggested that most of the time patients suffering from goiter were presented with normal thyroid function tests.

In this study, disease burden of thyroid dysfunction was found to be 34.21%, which was correlating with the study done by Akinpalli P et al [23] at Telangana (disease burden 30.2%) & with the study done by Desai PM et al [24] at Mumbai (disease burden 26%). The percentage of hypothyroid cases (30.46%) was found to be more as compared to hyperthyroid cases (3.75%) & the results were correlated with the studies done by Singla S et al [25]. at Punjab, and Chatterjee S et al [26] at West Bengal. The present study revealed that percentage of subclinical hypothyroidism (74.64%) followed by overt hypothyroidism (25.36%) and subclinical hyperthyroidism (61.76%) followed by overt hyperthyroidism (38.24%), which was similar with the studies done by Akinpalli P et al [23], and Kumar D et al [27].

Prevalence of Thyroid Disorders

Region	Hypothyroidism		Hyperthyroidism	
	Subclinical	Overt	Subclinical	Overt
Jammu & Kashmir (hospital / OPD)	33%	5%	1.6%	1.6%
India (community / mixed studies)	6-15%	1-4%	0.5-2%	<1-2%
Worldwide (population-based ranges)	4-10%	0.2-5%	0.7-2%	0.2-2.5%

Conclusion

Hypothyroidism was highly prevalent as compared to hyperthyroidism. Subclinical hypothyroidism cases were much more than other thyroid disorders. Females were highly affected as compared to males. Iodine deficiency being much more prevalent in Himalayan belt, & goitrogenic cases were commonly seen in these areas. Thus, highlighted the importance of Targeted screening for thyroid disorders to ensure early detection and better management outcomes.

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