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Original Research Article.

Epidemiology of Thyroid Dysfunction in Patients Evaluated By TFT at a Tertiary Care Lab in Central India

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ABSTRACT

Background: Thyroid abnormality is the most common endocrinological problem encountered in day to day practice. Clinicians request for thyroid tests in patients with presence or absence of clinical features. Results of thyroid assessment are suggestive of hypo or hyperthyroidism. The categories of thyroid dysfunction are subclinical and overt disease.

Materials & Methods: The study was carried out at SSIMS central clinical lab- biochemistry section. The design of the study was retrospective. Serum samples of patients were tested within 1 hour of sample collection using CLIA CL-1000i immunoassay.

Results: Higher prevalence rates of TD were found among patients aged 21 and 44 (61.0%) followed by those between 45 and 64 years 17.91% and 12.69% among those aged 15 years and below. The difference in the frequency of Thyroid Disorders among age groups is statistically significant (p<0.001). Shows the pattern of thyroid disease when screened with Thyroid stimulating Hormone (TSH), maximum being subclinical.

Conclusion: Thyroid dysfunction is a fairly common abnormality in clinical practice. The spectrum comprises of primary (overt) and subclinical conditions.

Key words: Thyroid Disorders (TD), Subclinical, Euthyroid, Iodine.

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INTRODUCTION

Thyroid abnormality is the most common endocrinological problem encountered in day to day practice. Clinicians request for thyroid tests in patients with presence or absence of clinical features. Results of thyroid assessment are suggestive of hypo or hyperthyroidism. The categories of thyroid dysfunction are subclinical and overt disease.[1,2]

Maximum thyroid dysfunction manifests with good signs and symptoms, whereas many of them may not be clinically obvious and are referred to as subclinical thyroid disorder. Subclinical TD includes both hyperthyroidism and hypothyroidism, both conditions T3 and T4 are normal but TSH is deranged.[3,4]

Overt hypothyroidism or hyperthyroidism can be clinically manifested and differentiated by a pattern of changes in serum T3, T4 and TSH. Subclinical thyroid disorders are essentially lab based diagnosis. Symptoms of subclinical hypothyroidism and hyperthyroidism are vague and may not present with usual symptoms. Thus, the clinical laboratory plays a significant role in establishing the diagnosis of thyroid disorders.[5,6]

Central India where this study was conducted is with poor soil and food iodine content. Both clinical and epidemiological studies have shown that subclinical hyperthyroidism is more common in this part. It can be concluded that TD is a common endocrine disorder in this part of India.

OBJECTIVES

The aim of the study was to review the pattern , frequency, age and gender distribution of thyroid dysfunction using laboratory tests.

MATERIALS & METHODS

The study was carried out at SSIMS central clinical lab-biochemistry section. The design of the study was retrospective.

Inclusion Criteria

1. All previously performed thyroid function tests carried between 1st November 2018 to 31st March 2019.
2. TFT of patients between 1 day to 79 years.

Exclusion Criteria

1. Patients with h/o anti thyroid drugs
2. Patients with incomplete TFT

Sampling and Data Collection

The sample size for the study consisted of the total number of thyroid function test results who fulfilled the selection criteria.[7-9]

Methodology

Serum samples of patients were tested within 1 hour of sample collection using CLIA CL-1000i immunoassay.

The reference values for various Thyroid Function tests.

T3- 52- 185 ng/dl

T4- 5- 15 µg/dl

TSH- 0.39-5mIU/L

Classification of thyroid dysfunction on the basis of laboratory tests:-

1. Subclinical hypothyroidism- N T3, T4 & increase TSH
2. Overt hypothyroidism- decrease T3 & T4 & increase TSH
3. Secondary hypothyroidism- decrease T3, T4 & TSH
4. Subclinical hyperthyroidism- N T3, T4& TSH
5. Overt hyperthyroidism- increase T3, T4 & decrease TSH

RESULTS

Table 1 represents an age-distribution of the thyroid function test results. Generally, there is a direct relationship between age and the occurrence of TD. Higher prevalence rates of TD were found among patients aged 21 and 44 (61.0%) followed by those between 45 and 64 years 17.91% and 12.69% among those aged 15 years and below. The difference in the frequency of TD among age groups is statistically significant ($p<0.001$).

Table 2 shows the comparison of thyroid function test results between males and females. Thyroid disorders are more common in females than in males.

Table 3 shows the pattern of thyroid disease when screened with TSH, maximum being subclinical.

Table 1: Age Distribution

Variable	Factor	n	%
Age Group	**1-20 Years**	73	12.69
	21-44 Years	356	61.91
	45-64 Years	103	17.91
	More Than 64	43	7.47

Table 2: Gender Distribution

Variable	Factor	n	%
Sex	**Male**	90	15.65
	Female	485	84.34

Table 3: Thyroid Disorders when screened with TSH

Variable	Factor	n	%
Screening With TSH	**Euthyroid**	472	82.08
	Hyperthyroid	80	13.91
	Hypothyroid	23	4

DISCUSSION

The spectrum of thyroid disease among the patients was evaluated by thyroid function tests at a clinical laboratory.

The high prevalence of thyroid diseases shows that it is a common problem in clinical practice. Baral and co-workers in their study conducted in eastern Nepal, reported a prevalence of approximately 30% while Mahato et al in another study found prevalence 36%. Thyroid disorders in our may be explained by geographical location, influence of age diet and possibly presence of environmental goiterogens.[10-12]

High rates of thyroid diseases are related to high prevalence of chronic non communicable diseases such as obesity, DM and NAFLD.

Recent studies have shown that TD plays a significant role in the aetiology of NAFLD. A study by Bano & co-workers observed that hypothyroid subjects had higher risk of NAFLD than their euthyroid counter parts.[13,14]

According to a study by Onyekwere et al among patients of type 2 DM reported an overall prevalence NAFLD to be 8.7%. Olusanya & co-workers reported prevalence rates 16.7% and 1.2% among T2DM patients and non-diabetic controls respectively. Both iodine deficiency and iodine sufficiency are associated with TD. Iodine deficiency is a well-known cause of TD and goitre. Iodine sufficiency has been associated with high cases of subclinical hypothyroidism.[15-17]

The pathophysiology of TD in iodine deficiency state is common. Iodine is essential for biosynthesis of thyroid hormones, insufficient dietary iodine and reduced supply of iodine to the thyroid gland will cause hormone derangement. Iodine deficiency induced hypothyroidism causes a compensatory increase in synthesis and secretion of TSH which in turn promotes growth and enlargement of thyroid tissue causing goitre.[18-20]

Our study showed that TD occurred among women between the ages 16 and 40 years due to iodine deficiency. Among the spectrum of TD in this study, primary hyperthyroidism is the commonest with a frequency of 13.7% with females more affected than males. Our study also showed that prevalence of subclinical TD to be 10.4% which predominates in areas of iodine sufficiency compared to regions of environmental and dietary iodine deficiency.

CONCLUSION

Thyroid dysfunction is a fairly common abnormality in clinical practice. The spectrum comprises of primary (overt) and subclinical conditions. The women of reproductive age being majorly affected than men.

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