



**PREVALENCE OF THYROID DYSFUNCTION AMONG THE ADULT POPULATION OF
KANCHIPURAM DISTRICT, TAMILNADU**

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ABSTRACT

Background: Thyroid disease is common worldwide and in India it is a major health issue in female adult population. Thyroid hormone regulates several metabolic process of the body, various functional or structural disorders of which lead to hypothyroidism. The severity depends on the degree and duration of thyroid hormone deprivation. It represents a wide-range and often nonspecific symptoms - so needs to be considered in many differentials and once diagnosed, needs to be regularly monitored to optimise therapy. Therefore initial clinical assessment and laboratory testing would provide a better diagnosis when thyroid dysfunction is suspected to minimize further complications. **Objective:** To establish the prevalence of thyroid disease in adult population of Kanchipuram district, TamilNadu. **Materials and Methods:** 1306 subjects, who attended the outpatient department of Sri Muthukumaran Medical College Hospital and Research Institute, Chennai for hormonal evaluation during the period of 2014 to 2015, were assessed for thyroid function test by Enzyme Linked Florescent Immunoassay (ELFA) with Mini-Vidas Auto analyzer. **Results:** Among the 1306 subjects, thyroid dysfunction was found in 35.83% (468) patients and 64.16% (838) had euthyroid. Out of 468 cases, 81.83% of patients were hypothyroid and 18.16% had hyperthyroid. There was significant difference in thyroid hormone levels ($p < 0.0001$) in hypothyroid and hyperthyroid as compared with euthyroid subjects. A high prevalence of hypothyroidism and hyperthyroidism was observed in the age group of 20 to 35 and 36 to 50 years respectively. **Conclusion:** Thyroid dysfunction by itself can cause various health related problems and can also affect the health and quality of life. Therefore routine screening during master health checkup program may be helpful in identifying individuals with thyroid dysfunction.

KEYWORDS: Hypothyroidism, Hyperthyroidism, Enzyme linked florescent immunoassay.

INTRODUCTION

Thyroid hormone plays a major role in maintaining basal metabolic rate (BMR), metabolism of biomolecules and helps in the process of growth, development, maturation of each and every cells, sexual development and reproduction.^[1] It regulates several functions of the body by constantly releasing a steady amount of hormones into the bloodstream. These effects are typically magnified in patients with either an overactive thyroid gland – hyperthyroidism or sluggish thyroid – hypothyroidism. In these two cases thyroid hormone abnormalities affects overall functions of the body and its manifestation leads to wide spectrum of clinical and biochemical diseases.^[2] In India, approximately out of 1.21 billion populations, 108 million people suffer from endocrine and metabolic disorders. Of these 108 million people, 42 million suffer from thyroid disease. India has

high prevalence of hypothyroidism, which affects 1 in 10 people.^[3]

The burden of thyroid disease in general population is enormous. The prevalence of these thyroid disorders varies widely according to geographical distribution, diet and nutrition.^[4] Thyroid function test is commonly used for evaluating and identifying of people with thyroid disorders. Therefore adults must be regularly screen for thyroid dysfunction by measurement of the serum thyroid hormone.

MATERIALS AND METHODS

Study population

1306 subjects who attended the out patients department of General Medicine of Sri Muthukumaran Medical College Hospital & Research Institute for hormonal evaluation during the period of 2014 to 2015. They were

referring to clinical biochemistry laboratory for thyroid function test.

Detailed history of demography, duration of illness, family history of thyroid disease and history of medication were taken.

The serum thyroid hormone (fT3, fT4 & TSH) levels were estimated by enzyme immune assay- sandwich method with a final fluorescent detection (ELFA) in Mini-Vidas auto analyser. The regular calibration and

quality control check was performed for the instrument performance and accuracy of the results.

The study subjects were grouped into I, II & III

- Group I – Subjects with euthyroid (n = 838)
- Group II – Subjects with Hypothyroidism (n = 383)
- Group III – Subjects with Hyperthyroidism (n = 85)

Statistical analysis

All numerical variables were expressed as Mean \pm SD. The data were analysed using the analysis of variance (ANOVA) with Microsoft SPSS version 20.

RESULTS

Table: I showing Mean, SD and levels of significance among the three groups.

Parameter	Group I (n - 838)	Group II (n - 383)	Group III (n - 85)	p-value
	Mean \pm SD	Mean \pm SD	Mean \pm SD	
fT3(pg/ml)	2.63 \pm 0.45	2.50 \pm 0.62	5.35 \pm 4.19	p < 0.0001
fT4(ng/dl)	1.07 \pm 0.20	0.94 \pm 0.31	2.07 \pm 1.23	p < 0.0001
TSH(μ IU/ml)	2.41 \pm 1.27	13.01 \pm 9.52	0.027 \pm 0.008	p < 0.0001

A p value < 0.05 was considered statistically significant.

Table I summarizes the mean, standard deviation and p value of free T3, free thyroxine and thyroid stimulating hormone in euthyroid, hypothyroid and hyperthyroid patients shows statically significant (p < 0.0001).

Table: II shows the result of post hoc test with multiple comparisons

parameter	group	Std. Error	p value
fT3	I vs. II	0.07283	< 0.031
	I vs. III	0.13442	< 0.0001
	II vs. III	0.14158	< 0.0001
fT4	I vs. II	0.02876	< 0.0001
	I vs. III	0.05307	< 0.0001
	II vs. III	0.05590	< 0.0001
TSH	I vs. II	0.61782	< 0.0001
	I vs. III	1.14023	< 0.0361
	II vs. III	1.20099	< 0.0001

A p value < 0.05 was considered statistically significant.

Table II summarizes the post hoc analysis of free T3, free thyroxine and thyroid stimulating hormone with multiple comparison of among the three groups. The freeT3 in group I vs. group II was statically significant (p < 0.031) and Thyroid stimulating hormone in group I vs. group II was statically significant (p < 0.036). The multiple comparison of remaining all other groups with fT3, fT4 and TSH were statically highly significant (p < 0.0001).

Table: III shows the prevalence of hypo and hyperthyroidism in four different age groups

Age group(Years)	Number of cases (n = 468)		Hypothyroidism (n = 383)		Hyperthyroidism (n = 85)	
	Male	Female	Male	Female	Male	Female
20 – 35 yrs	23	174	21	148	2	26
36 – 50 yrs	29	146	20	115	9	31
51 – 65 yrs	16	60	13	48	3	12
66 – 80 yrs	7	13	7	10	-	3

Table III summarizes hypo and hyperthyroidism in male and females with different age groups. The highest prevalence rate of hypothyroidism was found in the age group of 20 to 35 years, while hyperthyroidism was found in 36 to 50 years.

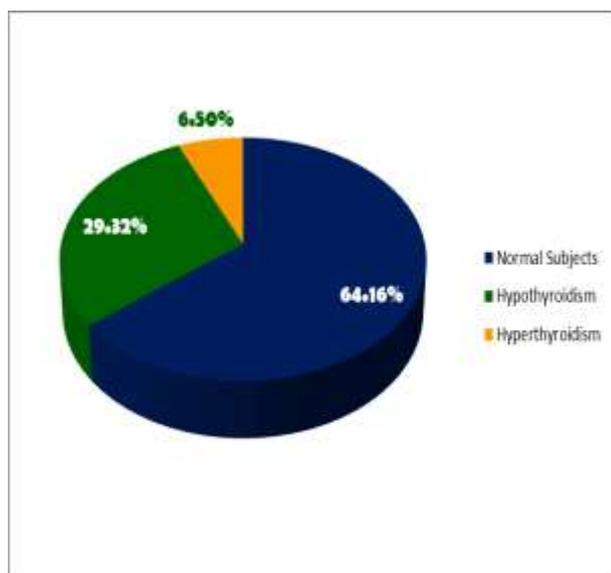


Fig: I show the overall prevalence rate of hypo and hyperthyroidism in total study population

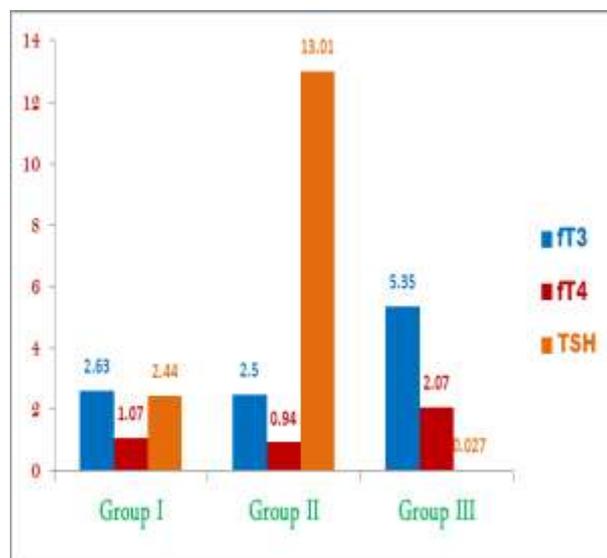


Fig: II represent the mean values of fT3, fT4 & TSH with three groups

DISCUSSION

Thyroid disorders are the most common endocrine disorders in India as well as abroad. In studies from western literature 50% of people in the community have microscopic nodules, 3.5% papillary carcinoma, 15% palpable goitres, 10% abnormal thyroid stimulating hormone level and 5% of women have overt hypothyroidism or hyperthyroidism.^[5]

According to this study, there is highly significant difference in fT3, fT4 and TSH when compared between the three groups. Thyroid disorders are more prevalent in females compared to males; ratio of males to females being 1:5. Hypothyroidism is common in the age group of 20 to 35 years; whereas hyperthyroidism in the age group of 36 to 50 years.

A cross sectional survey of thyroid abnormalities in Kerala, showed an overall prevalence of 19.6% of the population and a study on the prevalence of thyroid disorders in women of Pondicherry was 15.8%.^[6]

In our present study, the overall prevalence of thyroid dysfunction was found to be 35.82% of the population Kanchipuram districts, Chennai, Tamilnadu. Of these 35.82%, the 29.32% of subjects had hypothyroidism and 6.5% had hyperthyroidism.

CONCLUSION

In the early stages, thyroid dysfunction by itself is asymptomatic or can present with vague symptoms which can be easily overlooked. It can cause various health related problems leading to ineffective quality of life. Therefore routine screening during master health checkup program may be helpful in identifying individuals with thyroid dysfunction and also emphasis on biochemical, genetics and molecular studies to prevent or treat thyroid abnormalities at the earliest.

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Conflicts of Interest: None.

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