

A Study on Clinical Features and Biochemical Analysis of Hypothyroidism in Rural Medical College

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ABSTRACT

Background: Hypothyroidism is one of the common endocrinological disorders in India and Worldwide. Iodine deficiency is prevalent in South Asia, Central Africa, and Mountain Regions in India. It is more common in Females.

Aim: To study the clinical features and Biochemical analysis of Hypothyroidism patients in rural medical college.

Materials and Methods: We have examined the total number of 130 patients out of these 130 Males were 54 and Females were 76. This study has been conducted in the Department of General Medicine at Maheswarao Medical College, Sanga Reddy for 1 year from 2019 March to February 2020. The age group is between 20 years to 70 years. The investigations advised were T₃ T₄ TSH, Electrocardiogram, and lipid profile.

Results: We have examined 130 patients out of those 130 Males were 54 and Females were 76 out of 50 male patients 6 were having subclinical Hypothyroidism ECG abnormalities were noted in 105 patients. Abnormal lipid profile is seen in 82 patients, pericardial effusion is seen in 2 patients.

Conclusion: Study comprised of 130 patients. In our study

female patients are more common than Males. The common age group is between 20 years and 40 years. weight gain, dry skin, constipation are more common symptoms in our study.


Key Words: Hypothyroidism, Fatigue, Bradycardia, T₃ T₄ TSH, Hyperlipidemia, Pericardial Effusion.

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INTRODUCTION

Hypothyroidism is one of the common endocrinological disorders in India and Worldwide also. The prevalence is more in Mountain regions like the North Eastern States where Iodine deficiency is common.

Iodide uptake is a critical first step in thyroid hormonesynthesis.¹ About 93% of Metabolically active hormones secreted by the thyroid gland Thyroxine and 7% Triode-threonine. Triode-threonine is about 5 times as potent as threonine, but it's present in the blood in much smaller quantities and persists for a much shorter time than does thyroxine.² Hypothyroidism includes the overt state of Myxoedema, and organ effects, multisystem failure to asymptomatic subclinical hypothyroidism in which thyroxine and triodesthyroxine are normal and mildly elevated levels of Thyroid-stimulating hormone (TSH).³ Hypothyroidism is more prevalent in Central Asia, India, Bangladesh, Srilanka, The World Health Organisation estimates that about 2 billion people are iodine deficient, based on urinary excretion data. In

India, the commonly affected state is Meghalaya, Assam, Bihar, Himachal Pradesh.

It is estimated that more than 71 million people are population is affected by goiter in the country.⁴ Iodine deficiency remains a common cause of Hypothyroidism worldwide. Autoimmune disorders like Hashimoto's Thyroiditis, Drugs like amiodarone, Lithium amyloidosis are other causes.⁵

In India hypothyroidism is usually categorized under the cluster of Iodine deficiency disorders (IDDs), which were represented in terms of total goiter rates and urinary iodine concentration, typically assessed in School-aged children.⁶ India is supposedly undergoing a transition from iodine deficiency to a sufficient state. The common clinical features include weight gain, hoarseness of voice, dry skin, constipation puffiness of the face, Bradycardia, Hyperlipidaemia, coronary artery disease is commonly associated with Hypothyroidism. In females, hypothyroidism is usually associated with infertility. In primary hypothyroidism, the Sesame

TSH is always increased, while free T₄ is low. The normal reference range for ultrasensitive TSH level is generally 0.4 – 4.0 million units / L. However, the normal range varies with age.⁷

The common Electrocardiogram changes include sinus Bradycardia, T wave inversion, STT abnormalities, and incomplete RBBB and low voltage complexes.

MATERIALS AND METHODS

This study has been conducted in the department of General Medicine at Maheswarao Medical College for 1 year from 2019 March to 2020 February. College Ethical Committee approval has been obtained informed consent has been obtained from the

entire patient by giving consent form in the local language. A total of 130 patients were included in this study out of those 130 Males were 54 and Female's patients were 76. The patients with a history of symptoms and signs were included in this study and already diagnosed and the thyroid treatment was also included. The patients who were on amends once and b-Blockers and post thyroidectomy were excluded from this study. After taking care of the history and clinical examination the blood samples were collected and sent to complete the blood picture. T₃ T₄ TSH lipid profile and electrocardiogram was obtained.

The data is collected and analyzed systematically and computerized by using MS Office.

Chart I: Sex Distribution

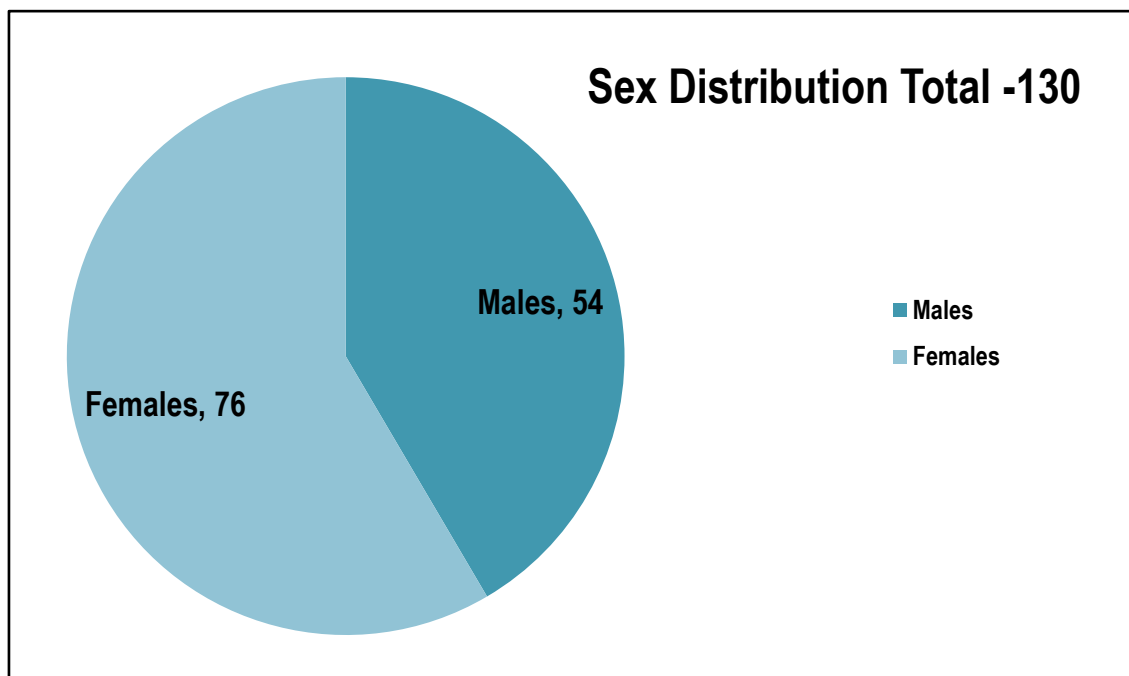


Chart II: Clinical Features

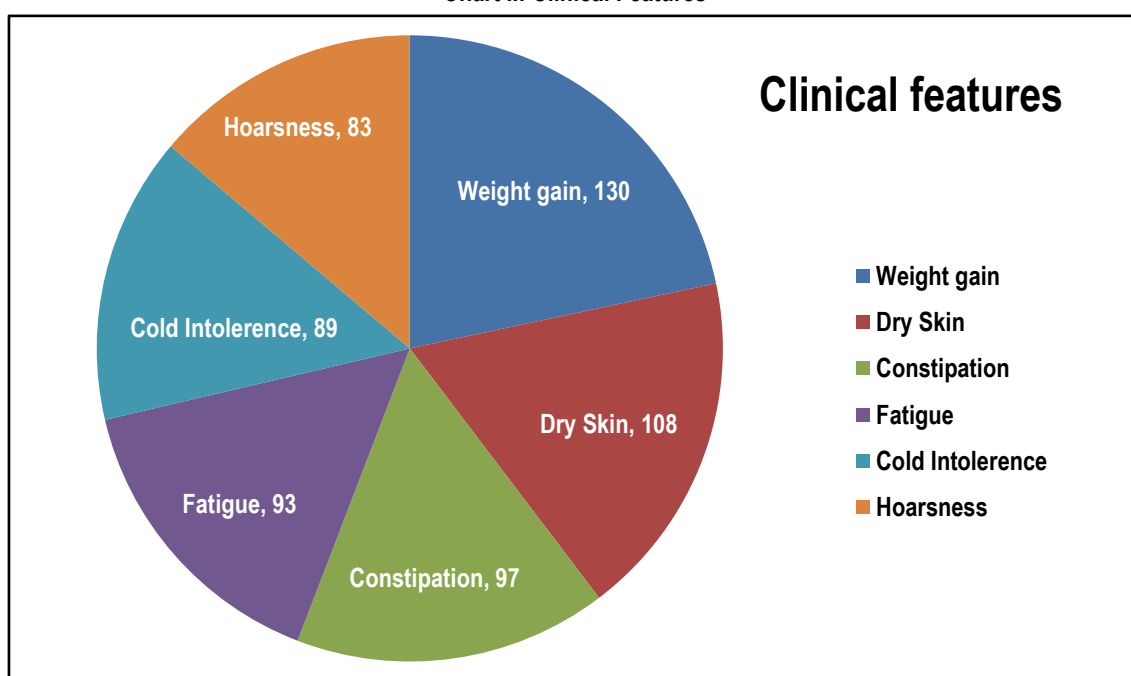


Table I: Age-wise Distribution

S.No.	Age Group In Year	Male Patients Total of 54	Female Patients Total of 76	Males & Females
1	20 - 29	12(22.22%)	18(23.68%)	30
2	30 – 39	15(27.78%)	24(31.57%)	39
3	40 – 49	13(24.07%)	22(29.78%)	25
4	50 – 59	8(14.55%)	7(9.21%)	15
5	60Yrs above	6(11.12%)	5(6.57%)	11

Table II: Symptoms and Signs

S.No	Symptoms	n	%	Signs	n	%
1	Weight gain	130	100%	Puffiness	113	86.92%
2	Dry Skin	108	83.07%	Paller	106	81.53%
3	Constipation	97	74.61%	Bradycardia	104	80.05%
4	Fatigue	93	71.53%	Nonpitting Edema	92	75.38%
5	Cold intolerance	89	68.46%	Others	33	40.25%
6	Hoarseness of voice	83	63.85%	N/A	N/A	N/A

Table III: Different Investigations

S.No	T ₃ ng/dl No. of Patients (%)	T ₄ µg/dl No. of Patients (%)	TSH µ unit/ml No. of Patients (%)	LDL mg/rs No. of Patients (%)
1	80 – 90(34.5%)	4 – 5(32.30%)	10 - 20(36.92%)	130 -140(31.53%)
2	70 – 80 (16.15%)	3.5 – 4(15.35%)	20 - 30(19.23%)	145 -150(17.60%)
3	60 – 70(22.30%)	3.3 – 5(21.53%)	30 – 40(17.69%)	150 -155(21.50%)
4	50 – 60(17.69%)	2.5 – 3(20.70%)	40 – 50(16.15%)	155 -160 (19.23%)
5	<50 ng/dl(9.23%)	<2.5 µgr/dl (13.84%)	>50µunit/ml(10.0%)	> 160(12.35%)

Table IV: Different ECG Changes

S.No.	ECG Changes	No. of Patients	Percentage
1	Sinus Bradycardia	124	95.38%
2	Low Voltage complexes	101	83.07%
3	T wave inversion	92	70.75%
4	Other abnormalities	86	66.15%

RESULTS AND DISCUSSION

In our study the total number of patients included was 130 out of these 130, 54 were Male patients and 76 were female patients. The age group is between 20 years and 60 years. In India, the prevalence in rural areas is not known. In our study, the Female preponderance is noted. The study conducted by Sharath et al shows F:M is 3:1.⁸

The reports by Jagadish et al shows 3.3:1.⁹ The common age group is between 20 and 40 years. The common clinical features in order of frequency are weight gain, dry skin, constipation, fatigue, hoarseness of voice, hair loss, and uterine bleeding in the case of females.

Lipid ab-normalization and changes in Electrocardiogram were noted in this study LDL cholesterol is elevated up to 165 right del. These results cases with the studies. Conducted by Unnikrishnan et al.¹⁰

The thyroid function test shows a mild to moderate decrease in T₃ and T₄ and moderates to a Gross increase in Thyroid-stimulating

hormone. Estimation of the Thyroid-stimulating hormone is the single most important test in Thyroid disorders.

Important Electrocardiogram ab-normalisation noted in our study were sinus Brady Cardia, low voltage complexes, T was ab-normalization.

Hypothyroidism is one of the common endocrinological disorders in India and Worldwide. Goiter which is due to Iodine deficiency is commonly associated with Hypothyroidism. Iodine deficiency is common in Mountain regions like Himachal Pradesh, Nagaland, and other states. The Thyroid gland consists of numerous spherical follicles. Composed of thyroid follicular cells, that surrounded, secreted colloid proteinaceous fluid containing large amounts of Thyroglobulin, the protein precursor of thyroid hormones. Increased demand for thyroid hormone is regulated by Thyroid-stimulating hormone TSH.¹⁰

Thyroid hormones are derived from TG, a large, iodinated glycoprotein, after secretion into the Thyroid that is subsequently coupled via, on other linkage re-up lakes of Tg into the Thyroid

follicular cells allow proteolysis and the release of newly synthesized T_4 and T_3 .¹¹

In our study 5 women, who are having Hypothyroidism are also pregnant. Since we aim to focus on clinical features and Biochemical analysis of Thyroid disorders. We have not recorded the other parameters. The study conducted by A. Sangitha Wagar et al shows a 12.7% prevalence of Thyroid disorders in pregnancy.¹²

The common clinical features are weight gain (100%), Dry skin (83%), Constipation (74%), Fatigue (71.53%), Cold Intolerance (68.46%) are almost similar to studies shown by Singh A Reddy MS et al.¹³ The weight gain is usually due to fluid retention in the Myxomatous tissue. There may be oligomenorrhoea and amenorrhoea in females in long-standing cases. Fertility is also reduced. Diverted blood flow from the skin leads to cold extremities.

A normal TSH level excludes primary but not secondary hypothyroidism circulating unbound T_3 levels are normal in about 25% of patients. The Etiology is easily established by demonstrating the presence of TPO antibodies which are present in >90% of patients with autoimmune hypothyroidism. But measurement is not needed routinely.¹⁴

In the investigations, TSH plays a key role. In the cases of Hypothyroidism TSH increases up to 100 uU/ml in moderate to severe cases. Low-density lipoproteins LDL also increases in Hypothyroidism. It is one of the reasons for coronary artery disease in Hypothyroidism cases. The common abnormalities in Electrocardiogram are sinus Bradycardia, low voltage complexes, and T wave abnormalities. In our study sinus Bradycardia was seen in 124 no. (95.38%), Low voltage complexes in 101 no. (83.07%), T wave inversions in 92 patients (70.75%). These changes are similar to observations made by Karki P et al.¹⁵

The studies shown by Madhu et al are low voltage complexes in 63.82% and T inversions in 52.35%.¹⁶

Because people with long standing hypothyroidism may have bradycardia which can mask substantial but asymptomatic coronary artery disease.¹⁷ Levothyroxine is the treatment of choice for hypothyroidism. The dose is commonly titrated upwards from a starting dose of 25-20 micrograms daily, a randomised controlled trial has shown that this approach is not necessary for most patients.¹⁸

CONCLUSION

Hypothyroidism is a very common endocrinological disorder. Females are more commonly affected, common clinical features we observed are weight gain, dry skin, fatigue, lipid abnormalities also note. In Electrocardiogram, Bradycardia, Low voltage complexes are commonly seen, Cardiac complications also common with thyroid disorders. In obese people, Hypothyroidism should be ruled out. In pregnant women, thyroid disorder has to be ruled out to prevent fetal abnormalities.

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