



## CARDIOVASCULAR MANIFESTATIONS OF HYPOTHYROIDISM IN GOVERNMENT GENERAL HOSPITAL VIJAYAWADA

**S. Sudheshna  
Katikitala**

Junior Resident, Department of General Medicine, Siddhartha Medical College, Gunadala, Vijayawada -520008, Andhra Pradesh, India.

**Niveditha Ragiri\***

Associate Professor, Department of General Medicine, Siddhartha Medical College, Gunadala, Vijayawada-520008, Andhra Pradesh, India. \*Corresponding Author

**ABSTRACT** **Background and Objectives of Study:** Cardiac abnormalities associated with hypothyroidism attracted great deal of investigational effort. There are only few studies done in our country to assess CVS manifestations in hypothyroid patients. Hypothyroidism is known to cause reversible cardiac dysfunction in humans. This study is aimed at studying the cardiac manifestations of hypothyroidism by ECG and ECHO.  
**Methods:** The data for this study was collected from 30 patients of hypothyroidism who met with inclusion criteria and exclusion criteria were clinically evaluated and underwent relevant investigations including thyroid profile estimation, cardiac evaluation using ECG and 2DECHO.  
**Results:** Most cases fell in the age group of 31-40 years. There was an overall female preponderance over all age groups with mean age of 34.6 years. On general examination weight gain and dry skin found in around 76.66% and 63.33% of patients respectively. Goitre was found in 3% of patients. Bradycardia seen in 40% and low voltage complexes seen in 33% of patients. Pericardial effusion seen in 26.7% and diastolic dysfunction seen in 26.67% of patients.  
**Conclusion:** Among 30 cases of hypothyroidism, pericardial effusion was found in 26.7% patients. Diastolic dysfunction was seen in 26.67%. Thus any unexplained pericardial effusion should be screened for hypothyroidism.

**KEYWORDS :** Hypothyroidism, ECG, ECHO.

### INTRODUCTION

Hypothyroidism is a clinical syndrome resulting from a deficiency of thyroid hormones, which in turn results in a generalized slowing down of metabolic processes. Hypothyroidism is fairly common in that it affects 2% of adult women and 0.1-0.2% of adult men. Thyroid hormone exerts direct cellular effects on almost all tissues of the body. It causes multi organ dysfunction due to deranged metabolism.

Cardiovascular complications are some of the most profound and reproducible clinical findings associated with thyroid disease. Hypothyroidism is associated with increased cardiovascular mortality and morbidity. The dysfunction ranges from functional systolic/diastolic dysfunction to overt failure and coronary artery disease. There are only few studies done in our country to assess the cardiovascular parameters in hypothyroid patients. Cardiac abnormalities associated with hypothyroidism attracted a great deal of investigation effort.

The completely reversible nature of these complications is well known. Hence this study aims at studying the cardiac manifestations of hypothyroidism by ECG and ECHO, thereby reassessing the need for early recognition and more aggressive management of the disease, aiming at preventing the aforementioned complications.

### METHODS

This is a cross sectional clinical study comprising of 30 cases of hypothyroidism coming to Government General Hospital, Vijayawada, Krishna district, Andhra Pradesh between July 2018 to July 2019.

### Inclusion Criteria

1. Newly diagnosed hypothyroid patients.
2. Detected hypothyroid patients not on treatment.
3. Patients on L-thyroxine for less than 4 months.

### Exclusion Criteria

1. Patients with known cardiac disease.
2. Patients with COPD, severe anemia, diabetes mellitus or any other endocrinal disorder.
3. Patients taking medications that alter the thyroid functions like beta blockers, lithium, OCP's, steroids and alcohol.

### RESULTS

30 cases of hypothyroidism were included in this study. Among 30 cases females outnumbered males (female-22, male-8). The female population constituted about 73.33% of the total. Most cases fell in the

age group of 31-40 years. The mean age is 35 years.

### Symptomatology

Most common symptoms are of weight gain, lethargy, dry skin and hoarseness of voice. Cold intolerance seen in 50% of patients and menstrual symptoms in 59% of patients. None of the patient had history suggestive of proximal muscle weakness.

### Symptomatic Findings

Presenting symptoms	Number(n=30)	Percentage %
1. Lethargy	20	66.6
2. Hoarseness	16	53.3
3. Dyspnea	9	30
4. Weightgain	22	73.3
5. Constipation	15	50
6. Cold intolerance	15	50
7. Depression	8	26.6
8. Dry skin	19	63.3
9. Menstrual symptoms	13	59.1

On general examination most common findings are weight gain and dry skin found in around 76.6% and 63.3% of patients respectively. Goitre was found in 3% of patients, bradycardia was found in 30% of patients and hypertension above 140/90mmHg was found in 23% of patients.

### General Examination Findings

General Examination	Number(n=30)	Percentage %
1. Pallor	8	26.66
2. Dry skin	19	63.33
3. BMI>25kg/m <sup>2</sup>	23	76.66
4. Goitre	3	10
5. Edema	6	20
6. Pulse<60/min	12	30
7. BP 120/80-140/90	13	43.33
8. BP above 140/90	7	23.33

On systemic examination diminished heart sounds were found in 26.66% of patients. CNS examination revealed delayed ankle jerk seen in 66.66% followed by hoarseness of voice.

### Systemic Examination findings

Systemic Examination	Number(n=30)	Percentage %
A. CVS		

1. Cardiomegaly	2	6.66
2. Diminished heart sounds	8	26.66
<b>B. CNS</b>		
1. Delayed ankle jerk	20	66.66
2. Hoarse voice	16	53.33

Lipid analysis showed increase of Total Cholesterol(TC), Low Density Lipoproteins(LDL), Very Low Density Lipoproteins(VLDL), Triglycerides(TGL), and decrease of High Density Lipoproteins(HDL) in mild, moderate and severe cases.

Normal ECG is found in 30% of patients. Bradycardia is the most common finding seen in 40% of patients. Low voltage complexes is seen in 33% of patients.

#### ECG Findings

ECG	Number(n=30)	Percentage %
1. Normal	9	30
2. Bradycardia	12	40
3. Low voltage complexes	10	33.33
4. STT changes	8	26.66
5. LBBB	2	6.66
6. RBBB	3	10

Echo findings are normal in 30% of patients. Pericardial findings is the next common finding seen in 26.7% of patients. Diastolic dysfunction seen in 26.7% of patients, majority of them being mild dysfunction. No cases found to have severe diastolic dysfunction.

#### Echo Findings

Echo findings	Number(n=30)	Percentage %
1. Normal	10	30
2. Systolic dysfunction	2	6.67
3. Pericardial effusion	8	26.67
<b>Diastolic dysfunction</b>		
1. Mild	7	23.33
2. Moderate	1	3.33
3. Severe	Nil	0

#### DISCUSSION

The observations made in 30 cases of hypothyroidism that presented to Department of Medicine, Government General Hospital, Vijayawada from July 2018 to July 2019 is discussed here.

#### Age and Sex Distribution

The age range of the study is between 21-60 years. Most patients belonged to the age group of 31-40 years. There was an overall female preponderance over all age groups. The female population constituted about 73.3 % of the total.

#### Symptom Analysis

The most common of the symptoms included weight gain, lethargy, dry skin, hoarseness of voice and constipation.

#### General Physical Examination

On general examination most common findings are weight gain and dry skin found in around 76.66% and 63.33% of patients respectively. Goitre was found in 3% of patients. Bradycardia was found in 30% of patients and hypertension above 140/90 was found in 23% of patients.

#### Systemic Examination

Delayed relaxation of the ankle jerk is the most common finding present in 66.66% of patients. On cardiovascular examination cardiomegaly is found in 6.66% of the patients. Diminished heart sounds accounting for 26.66% of the total indicating the probability of pericardial effusion.

#### Lipid Profile

There is an increase of Total Cholesterol(TC), Low Density Lipoproteins(LDL), Very Low Density Lipoproteins(VLDL), Triglycerides(TGL) and decrease of High Density Lipoproteins(HDL). There is no statistical significance among mild, moderate and severe hypothyroidism cases.

#### ECG changes and Hypothyroidism

ECG is normal in 30% of patients. Among abnormal ECG which constitutes 70% of the patients, low voltage complexes present in

33.33% of patients. On ECG the most common finding was bradycardia, present in 40% of cases. LBBB and RBBB found in 6.66% and 10% respectively.

#### ECHO findings and Hypothyroidism

Echo findings are normal in 40% of cases. Pericardial effusion is the next common finding seen in 26.7% of patients. Diastolic dysfunction seen in 26.67% , majority of them being mild dysfunction 7 among 8 patients. Systolic dysfunction seen in 6.67% of patients.

#### CONCLUSION

Among 30 cases of hypothyroidism majority of the patients were between the age group of 31-40 years of which majority of them were females. Most common symptoms are weight gain, lethargy, dry skin, hoarseness of voice, cold intolerance and other menstrual symptoms. Diminished heart sounds and delayed ankle jerk were seen in systemic examination. A significantly deranged lipid profile is also seen.

Bradycardia is the most common ECG finding followed by low voltage complexes. Pericardial effusion is the most common abnormal finding in Echo. Any unexplained pericardial effusion should be screened for hypothyroidism.

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