



STUDY OF CARDIOVASCULAR MANIFESTATION IN HYPOTHYROIDISM PATIENTS ADMITTED IN TERTIARY CARE CENTER HAMIDIA HOSPITAL BHOPAL

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ABSTRACT

Background: hypothyroidism is common treatable cause of cardiac dysfunction. There are only limited studies in our country to evaluate cardiovascular involvement in hypothyroid patient. Hypothyroid patients requires detailed cardiovascular evaluation

Aim: This study was aimed at studying the cardiovascular involvement in hypothyroidism.

Materials and methods: this study include 100 patients from outpatient and inpatient in hamidia hospital Gandhi medical college Bhopal. After informed consent data recorded after clinical examination and investigation.

Results: after clinical examination 20 patients have reduced intensity of heart sound, after electrocardiography 35 patients have normal ecg, 45 patients have bradycardia, and ecg of 10 patients suggesting low voltage complex examination. After echocardiography 40 patients have normal echo, pericardial effusion found in 32 patients, 18 patients have diastolic dysfunction and interventricular septum thickening noted in 4 patient.

Conclusion: All hypothyroid patients requires cardiac evaluation to early diagnosis of complication.

KEYWORDS :

Hypothyroidism characterized by low metabolic state because of reduced thyroid hormone which leads to reduced metabolic processes. [1] Hypothyroidism is common in that it affects 2% of adult women and 0.1-0.2% of adult men. Thyroid hormones acts directly on cellular receptors on almost all tissues of the body. Deficiency of thyroid leads to deranged multi-organ function [2]. Cardiovascular complications are some of the severe and treatable clinical findings associated with thyroid disease. Hypothyroidism is associated with increased cardiovascular mortality and morbidity, cardiac involvement ranges from systolic and diastolic dysfunction to heart failure and coronary heart disease. Most of These complications are reversible. Hence The aim of study is early diagnosis and aggressive treatment to prevent the complication.

Material and methods

Study was conducted in Gandhi medical college Bhopal Madhya Pradesh from jan 2017 to dec 2017. 100 patients enrolled in this study from OPD and ward who have deranged thyroid profile and symptoms of hypothyroidism.

Inclusion criteria : recently diagnosed hypothyroid, previously diagnosed hypothyroidism but not on treatment.

Exclusion criteria: patients previous cardiac illness, diabetic, patient taking medicine that impair thyroid function, copd, and severe anemia.

After Detailed history clinical examination done as per proforma attached . All the patients in this study had some or other clinical features of hypothyroidism and diagnosis of which was proved by thyroid function tests. Following investigations were done in all the cases included in present study i.e. Hemoglobin, WBC , DLC, ESR, PS comment, Urine routine, sugar, albumin, microscopy, Random blood sugars, Blood urea , Serum creatinine, Lipid profile, A standard 12 lead ECG, T3, T4, TSH, ECHO - color Doppler study.

Statistical analysis Measures of central tendency ,Measures of dispersion

RESULTS

Most cases fell in the age group of 31-40 years. The mean age was 35 years. The female population was about 75% of the total. Female preponderance was seen in the age group of 31-40 years. Female to male ratio was 3:1. Most common symptoms were of weight gain (73%), lethargy (65%) and dry skin (63%). Constipation and cold intolerance was found in 50% of the patients and menstrual symptoms in 40% of the female patients. On general examination, most common findings were weight gain and dry skin found in around 68% and 63% of patients respectively. Goiter was found in 10% of patients, bradycardia was found in 40% of patients and hypertension above 140/90 mmHg was found in 23% of patients. Prevalence rate of

cardiovascular involvement in 100 hypothyroidism patients was 60 per 1000 (Table – 1).

Table 1 prevalence of cardiovascular involvement in hypothyroidism

| Cases | No of cases |
|--|-------------|
| patients with hypothyroidism | 100 |
| patients with cardiovascular involvement | 60 |

On systemic examination, diminished heart sound was found in 25% patients. CNS examination revealed delayed ankle jerk in 68% followed by hoarse voice in 40%. (table 2)

(Table–2). Systemic examination findings

| Systemic examination | Number n 100 | % |
|-------------------------------|--------------|----|
| Cardiovascular system | | |
| cardiomegaly | 8 | 8 |
| Diminished Heart sound | 25 | 25 |
| Central nervous system | | |
| Hoarse voice | 40 | 40 |
| Delayed relaxation ankle jerk | 68 | 68 |

Normal ECG was found in 35% of patients. Bradycardia was most common finding seen in 45 patients. Low voltage complexes in 10%. (Table - 3).

Table 3 ECG changes

| Ecg | % |
|---------------------|----|
| Normal | 35 |
| Bradycardia | 40 |
| Low voltage complex | 10 |
| Bundle branch block | 8 |
| ST-T changes | 7 |

Echo findings were normal in 40% cases. Pericardial effusion was seen in 32% cases. Diastolic dysfunction in 18%, systolic dysfunction in 6 cases. IVS thickness was in 4 cases. (Table –4)

Table 4 echo findings

| Echo | Number |
|-------------------------------------|--------|
| Normal | 40 |
| Pericardial effusion | 32 |
| Diastolic dysfunction | 18 |
| Systolic dysfunction | 6 |
| Inter ventricular septum thickening | 4 |

In this study, cardiovascular manifestation was high with the serum TSH of $\geq 50 \mu\text{iu/l}$ compared to the levels between 5-50 $\mu\text{iu/l}$,

DISCUSSION

The observational study of 100 new cases of hypothyroidism who presented to the Department of Medicine, Gandhi Medical College, Bhopal, discussed here and results have been compared with other similar studies. Overall incidence of Hypothyroidism was 0.375 per 1000 and Incidence of Cardiovascular involvement in these patients was 60. In 99% of the patients, Hypothyroidism is usually due to the Thyroid Disorders [4]. In our study, all the patients were with primary hypothyroidism. The age range of the study was between 21-60 years. Most patients belonged to the age groups of 31-40 years. Female preponderance was seen in between 31 - 40 years. The female population constituted about 75% of the total [1]. The most common symptoms included were weight gain (73%), lethargy (65%), dry skin (63%), constipation and hoarseness of voice (40%) [5].

On general examination, most common findings were weight gain and dry skin found in around 68% and 63% of patients respectively. Goiter was found in 10% of patients, bradycardia was found in 45% patients and hypertension above 140/90 mmHg in 23% of patients. Klein in his study of 907 patients found the incidence of Hypertension to be 21% [6]; some authors [7] studied 19 patients of hypothyroidism have hypertension in 35% patients. Bradycardia and decreased stroke volume results in decreased cardiac output in Patients of hypothyroidism.

On cardiovascular examination, cardiomegaly was found in 8% of the patients, diminished heart sounds in 25% patients, indicating probability of pericardial effusion.

ECG was normal in 35%. Among abnormal ECG, the most common findings were sinus bradycardia present in 40% of cases. Low voltage complex in 20 % cases, bundle branch block in 8%. This finding is consistent with other studies like by R. Varma, et al. [10] except conduction disturbances. M.H. Nikoo [9], also documented sinus tachycardia QT prolongation and also ventricular tachycardia which are not found in our study. Echo findings were normal in 40% cases. Pericardial effusion was next common finding seen in 32% cases. The study by R. Verma, et al. [10] in 1995 showed the prevalence of effusion to be 45%. Pericardial effusion is reported to occur in 30% to 80% of patients with hypothyroidism [3]. In our study, a low incidence of pericardial effusion may be due to inclusion of recently diagnosed hypothyroid cases.

Diastolic dysfunction in 18% patients systolic dysfunction in 6%. In a study by R. Verma in 1995 it was seen that 27% of patients had diastolic dysfunction. Systolic dysfunction was seen in 7.5% of patients. Forfar JC, et al. [11]

IVS thickness was found only in 4 cases in our study. There was no evidence of LVPW thickness in our cases. Rawat and Satyal reported LVPW thickening to occur. Bello, et al. [13]; Monzani, et al. [14]; and Bernstein, et al. [15] did not find similar incidences.

As per our study, patients with higher serum TSH levels had more number of patients with cardiovascular illness. Involvement of systems in hypothyroidism depends on duration, onset and severity of hypothyroidism. In our study sample of patients is less, so definite conclusion cannot be drawn. In order to show relation between levels of TSH and Involvement of cardiovascular system a study should be done in larger number of patients

Conclusion

In this study consisting of 100 new hypothyroid patients, most common symptoms were the weight gain, lethargy, dry skin and bradycardia was the most common abnormal finding followed by low voltage complexes in ECG. Cardiovascular manifestation related with severity and duration of increased TSH. In this study, cardiovascular complications were increased with increasing levels of TSH. Large sample size study is needed to support these findings. Pericardial effusion and diastolic dysfunction are the most common abnormal findings in ECHO. So that all the patients diagnosed with hypothyroidism are to be screened for pericardial effusion and other cardiac complications.

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