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A study on symptomatic manifestations in hyperthyroidism

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Abstract
Introduction: Thyroid hormones are very vital for the normal functioning of heart. Cardiovascular manifestations are frequent findings in both hypothyroidism and hyperthyroidism. Both hypothyroidism and hyperthyroidism can produce changes in cardiac contractility, myocardial oxygen consumption, cardiac output, blood pressure and systemic vascular resistance.
Methodology: Patients diagnosed to have hyperthyroidism according to free T_3, free T_4, TSH levels, who fulfill inclusion and exclusion criteria from outpatients and inpatients of Tertiary care hospital.
Results: In this Observational study which included 100 hyperthyroid patients 70% patients were in the age group 40-60 years, 70% of the patients had palpitation, 27% of the patients had dyspnoea and 5% of the patients had chest pain.
Conclusion: All patients of hyperthyroidism must be screened for cardiac disease in view of high incidence of pulmonary hypertension, systolic heart failure & diastolic heart failure which can be reverted with early recognition & prompt treatment.

Keywords: hyperthyroidism, electrocardiographic changes, echocardiographic changes, tachycardia, atrial fibrillation, pulmonary hypertension, systolic dysfunction

1. Introduction

Hyperthyroidism results in excess mortality from increased incidence of circulatory diseases and dysrhythmias. Incidence of cerebral embolism is more in hyperthyroid patients with atrial fibrillation, especially in the elderly and anticoagulation is indicated in them. Treatment of hyperthyroidism results in conversion to sinus rhythm in up to two-third of patients. Beta-blockers reduce left ventricular hypertrophy and atrial and ventricular arrhythmias in patients with hyperthyroidism [1, 2].

The cardiovascular system has long been recognized as one of the most important targets of thyroid hormones (THs). Low thyroid function has been linked to a variety of heart diseases, including myocardial infarction, coronary atherosclerosis, and congestive heart failure [3].

Cardiovascular signs of hyperthyroidism include tachycardia, widened pulse pressure, marked increases in cardiac output, and impaired cardiovascular and respiratory exercise capacity. In the elderly hyperthyroid patient, symptoms and signs of heart failure and/or worsening of angina pectoris may dominate the clinical picture and mask the more classical endocrine manifestations of the disease. Long-term follow-up studies have revealed increased mortality in those with a past history of overt hyperthyroidism, as well as those with subclinical hyperthyroidism. Supraventricular arrhythmias, particularly AF, in older patients may account for some of the excess cardiovascular and cerebrovascular mortality described, especially because AF is known to predispose to embolic phenomena. Regarding the high incidence of AF in older patients with hyperthyroidism, it is also important to detect subclinical hyperthyroidism, thus warranting the measurement of the serum TSH concentration for an early recognition and treatment. Most cardiac abnormalities return to normal once a euthyroid state has been achieved, although AF may persist in a minority [4].

Pulmonary Artery Hypertension is defined by a pulmonary artery pressure > 25 mm Hg at rest. Pulmonary hypertension is usually a complication of left heart failure, pulmonary parenchymal or vascular disease, thromboembolism, or a combination of these factors [5, 6].

Thyroid disease has been associated with pulmonary hypertension. Many authors have suggested an association between endocrinopathies, in particular hypothyroidism and hyperthyroidism, and Pulmonary hypertension.

Some studies have shown the prevalence of PAH in patients with hyperthyroidism in a study that evaluated patients recently diagnosed with hyperthyroidism, the prevalence of PAH was found to be 35 % in another study, involving 114 patients with hyperthyroidism, the prevalence of PAH was found to be 43% [7].

2. Methodology

An Observational study consisting of 100 cases of hyperthyroidism is undertaken to study the cardiac manifestations by clinical, ECG and ECHO findings.

Sample size

100 cases of hyperthyroidism meeting inclusion criteria of present study.

Inclusion Criteria

1. Patients who are diagnosed to have hyperthyroidism by free T3, free T4 and TSH levels.
2. Patients who give consent for study.
3. Age 18-60 years.

Exclusion Criteria

1. Age < 18 years.

2. Patient on Anti-arrythmic drugs.
3. Patients with known cardiac disease, congenital heart disease, rheumatic heart disease, ischemic heart disease.

Methodology

A detailed clinical history of subjects was taken as per proforma. Each subject underwent a detailed physical examination and systemic examination. A standard 12 lead ECG was recorded in all subjects to look for any abnormalities. Routine hematological and biochemical investigations including, hemoglobin concentration, blood sugars, blood urea and serum creatinine, lipid profile, urine routine, Thyroid function test, 2D ECHO were done. Chest X-ray was done to rule out any abnormality.

3. Results

Table 1: Age wise incidence of hyperthyroid patients

Age group	Male (%)	Female (%)	Total (%)
<20	3 (5)	1 (2.5)	4 (4)
21-40	15 (25)	11 (27.5)	26 (26)
41-60	42 (70)	28 (70)	70 (70)
Total	60 (100)	40 (100)	100 (100)

This study was conducted in ESIC MC & PGIMSR hospital between above mentioned period. Majority of patients were in the age group 41-60 years.

Table 2: severity of incidence of hyperthyroidism patients

TFT	Male (%)	Female (%)	Total (%)	P value
Overt	52 (86.67)	34 (85)	86 (86)	0.806
Subclinical	8 (13.33)	6 (15)	14 (14)	
Total	60 (100)	40 (100)	100 (100)	

In this study 86% patients had overt hyperthyroidism compared to 14% patients, who had subclinical hyperthyroidism.

Table 3: General symptoms of hyperthyroid patients

General Symptoms		Male (%)	Female (%)	Total (%)	P value
Weight Loss	Present	48 (80)	22 (55)	70 (70)	0.0075
	Absent	12 (20)	18 (45)	30 (30)	
	Total	60 (100)	40 (100)	100 (100)	
Excessive Sweating	Present	22 (36.67)	18 (45)	40 (40)	0.4062
	Absent	38 (63.33)	22 (55)	60 (60)	
	Total	60 (100)	40 (100)	100 (100)	
Tremors	Present	26 (43.33)	10 (25)	36 (36)	0.0614
	Absent	34 (56.67)	30 (75)	64 (64)	
	Total	60 (100)	40 (100)	100 (100)	
Diarrhoea	Present	7 (11.67)	1 (2.5)	8 (8)	0.0979
	Absent	53 (88.33)	39 (97.5)	92 (92)	
	Total	60 (100)	40 (100)	100 (100)	
Heat Intolerance	Present	3 (5)	3 (7.5)	6 (6)	0.6033
	Absent	57 (95)	37 (92.5)	94 (94)	
	Total	60 (100)	40 (100)	100 (100)	
Increased Appetite	Present	22 (36.67)	14 (35)	36 (36)	0.8625
	Absent	38 (63.33)	26 (65)	64 (64)	
	Total	60 (100)	40 (100)	100 (100)	
Decreased Sleep	Present	17 (28.33)	17 (42.5)	34 (34)	0.1426
	Absent	43 (71.67)	23 (57.5)	66 (66)	
	Total	60 (100)	40 (100)	100 (100)	
Goitre	Present	1 (1.67)	1 (2.5)	2 (2)	0.7642
	Absent	59 (98.33)	39 (97.5)	98 (98)	
	Total	60 (100)	40 (100)	100 (100)	
Easy Fatigability	Present	31 (51.67)	23 (57.5)	54 (54)	0.33
	Absent	29 (48.33)	17 (42.5)	46 (46)	
	Total	60 (100)	40 (100)	100 (100)	
Oligo menorrhea	Present	NA	6 (15)	6 (15)	NA
	Absent	NA	34 (85)	34 (85)	
	Total	NA	40 (100)	40 (100)	

Table 4: Cardiovascular symptoms of hyperthyroid patients

Cardiovascular symptoms		Male (%)	Female (%)	Total (%)	P Value
Palpitations	Present	43 (71.67)	27 (67.5)	70 (70)	0.2
	Absent	17 (28.33)	13 (32.5)	30 (30)	
	Total	60 (100)	40 (100)	100 (100)	
Breathlessnes	Present	18 (30)	9 (22.5)	27 (27)	0.68
	Absent	42 (70)	31 (77.5)	73 (73)	
	Total	60 (100)	40 (100)	100 (100)	
Chest pain	Present	2 (3.33)	3 (7.5)	5 (5)	0.88
	Absent	58 (96.67)	37 (92.5)	95 (95)	
	Total	60 (100)	40 (100)	100 (100)	

70% of the patients had palpitation, 27% of the patients had dyspnea and 5% of the patients had chest pain.

4. Discussion

The age of the patients in the present study ranged from 18-60 years. In the present study peak incidence was observed in the age group of 41-60 years (70%), followed by the age group of 21-40 years (26%).

In the present study commonest symptom among the general symptoms was found to be weight loss (70%), followed by easy fatigue (54%), excessive sweating (40%), tremors (36%), decreased sleep (34%) and increased appetite in 36%.

In the present study commonest cardio vascular symptom was found to be palpitation (70%), followed by Dyspnoea (27%) and chest pain (5%). This is also in agreement with the fact that palpitation and dyspnoea are the common symptoms of hyperthyroidism irrespective of the cause.

Table 5: Comparison of symptoms of cardiovascular system with other studies.

Symptoms of cardiovascular system	Osman *et al.* [8]	Zarger *et al.* [9]	Present study
Palpitation	73	69.4	70
Dyspnoea	60	-	27
Chest pain	25	-	5

In this study 70% of the patients had tachycardia which is comparable with the Zargar *et al.* [9] where it is 69.4%. 27% of the patients had dyspnoea in the present study where as in Osman *et al.* it is 60% and 5% had chest pain in the present study where as in Osman *et al.* it is 25%.

Table 6: Comparison of signs of cardiovascular system with other studies.

Sign of cardiovascular system	Zarger *et al.* [9]	Klein *et al.* [10]	Present study
Tachycardia	63.5%	-	85%
Wide pulse pressure	-	30%	27%
Pedal oedema	-	5%	13%

In this study 85% of the patients had tachycardia which is comparable with the Zargar *et al.* [9] where it is 63.5%. 27% of the patients had widened pulse pressure in the present study where as in Klein *et al.* it is 30% and 13% had pedal oedema in the present study where as in Klein *et al.* it is 5%.

5. Conclusion

In this Observational study which included 100 hyperthyroid patients 70% patients were in the age group 40-60 years, 70% of the patients had palpitation, 27% of the patients had dyspnoea and 5% of the patients had chest pain.

6. References

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