

Original article:

Study of co - relation of signs and symptoms of thyroid diseases with thyroid function tests and other biochemical and metabolic parameters in Indian population

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Abstract:

Introduction: Thyroid disease is quite common affecting as many as 9% to 15% of adult female population and smaller percentage of adult male. With this background present study was planned to assess co - relation of signs and symptoms of thyroid diseases with thyroid function tests and other biochemical and metabolic parameters in Indian population

Methodology: Clinically suspected thyroid disorders patients were subjected for the estimation of serum TSH, T4 and T3 levels. Biochemically confirmed thyroid dysfunction patients from both outpatient and inpatient departments were taken up for this study.

Results : 12 patients (27.27%) out of 44 hypothyroid patients had a serum cholesterol level greater than or equal to 250 mg%. Another 16 patients (36.36%) had a borderline high cholesterol level. Thus 28 patients (64%) had borderline high or high serum cholesterol level.

Conclusion: Hypothyroidism was associated with high serum cholesterol levels whereas maximum patients with hyperthyroidism had normal serum cholesterol levels.

Introduction

Thyroid disease is quite common affecting as many as 9% to 15% of adult female population and smaller percentage of adult male. However, with advancing age the incidence of disease in males and females is equal.^{1,2} There are multiple systems on which thyroid hormone acts or hormone is supplementary to their functions but heart is the major target organ. Marked changes occur in patients with hypothyroidism and hyperthyroidism. Many symptoms and signs recognized in patients with overt hyperthyroidism and hypothyroidism are due to increased or reduced action of thyroid hormone on heart and vascular system.³ Common signs and symptoms for hypothyroidism include lethargy, cold intolerance, weight gain, constipation, coarse dry skin, hair loss, hoarse voice, bradycardia and psychomotor retardation. It may be accompanied by weak arterial pulse, diastolic hypertension,

cardiomegaly, distant heart sounds and pericardial Effusion.^{3,4} With this background present study was planned to assess co - relation of signs and symptoms of thyroid diseases with thyroid function tests and other biochemical and metabolic parameters in Indian population.

Materials and methods :

72 consecutive fresh cases of thyroid disorders including hypothyroidism and hyperthyroidism were studied for the cardiovascular manifestations attending Pad. Dr. D. Y. Patil Medical College and Hospital, Pimpri, Pune. The diagnosis was suspected clinically and established by biochemical investigations. Out of these, 44 cases were of hypothyroidism and 28 cases were of hyperthyroidism.

Clinically suspected thyroid disorders patients were subjected for the estimation of serum TSH, T4 and T3 levels. Biochemically confirmed thyroid dysfunction patients from both outpatient and inpatient departments were taken up for this study. Written consent was taken from all the patients. Detailed clinical examination was done of each patient according to the proforma prepared to facilitate a systemic study in all cases with special emphasis on cardiovascular involvement. In all confirmed thyroid disorder patients, necessary investigations were done where ever required.

Methods of collection of data

- Patients above the age of 13 years were included in this study.
- Patients of both sexes were studied.
- Newly diagnosed consecutive patients for thyroid disorders were included in this study.
- Indian patients from all socio - economical class, castes, and from rural and urban areas were studied.

Exclusion criteria:-

1. Pre existing heart diseases with subsequent thyroid disorders like Rheumatic heart disease, Ischemic heart disease, hypertensive heart disease and cardiomyopathy.
2. Thyroid dysfunction due to drugs used in cardiovascular disorders like Amiodarone.
3. Other pre existing cardiovascular diseases like myocarditis due to viral, diphtherial and other infections.
4. Pre existing or established ECG changes.
5. End stage renal disease and chronic kidney diseases.

On clinical suspicion of thyroid dysfunction (hypothyroidism or hyperthyroidism) with or without thyroid enlargement, the patient was subjected to further clinical and laboratory evaluation.

Results:

Table 1) Total Serum Cholesterol in hyperthyroid Patients (n = 28)

Total S. Chol. (mg%)	No. of cases	%age
< 200	19	67.86
200-250	6	21.43
> 250	3	10.71

Table 2) LDL levels in hypothyroidism (n = 44)

LDL levels (mg%)	No.of patients	Percentage
>160	8	18.18
130 -160	27	61.82
<130	9	20.00

Table 3) LDL levels in hyperthyroidism(n = 28)

LDL levels	No. of patients	Percentage
>160 mg%	0	0%
130-160 mg%	10	35.71%
<130 mg%	18	64.29%

Table 4) HDL in hypothyroidism. (n=44)

HDL levels	No. of patients	Percentage
<40 mg%	38	86.36%
40-50mg%	6	13.64%
>50 mg%	0	0%

Table 5) Triglycerides in hypothyroidism(n=44)

Triglyceride levels	No. of patients	Percentage
<160 mg%	11	25%
160-200 mg%	30	68.18%
>200 mg%	3	6.82%

Discussion:

The commonest cardiovascular symptom in this group was palpitations. 15 out of 28 patients (53.57%) had palpitations, 13 patients (46.53%) had fatigability, 10 patients (35.71%) had dyspnea and 4 patients (14.29%) had chest pain. 12 patients (27.27%) out of 44 hypothyroid patients had a serum cholesterol level greater than or equal to 250 mg%. Another 16 patients (36.36%) had a borderline high cholesterol level. Thus 28 patients (64%) had borderline high or high serum cholesterol level. Yazbeck et al found hypercholesterolemia in 57%.¹¹⁶ Duntas et al and many other workers found marked increase in total cholesterol and low density lipoproteins in hypothyroidism.^{5, 6, 7} The highest serum cholesterol level was 375 mg% in present study. Many studies support lower total and LDL cholesterol levels in hyperthyroidism.⁵³ 19 patients (67.86%)^{6, 7} out of 28 hyperthyroid patients had serum cholesterol level less than 200 mg%. Lowest level of serum cholesterol was 108 mg%.

13 patients out of the 15 patients who had ST-T changes on ECG had a high or borderline high serum cholesterol levels. In present study, 28 (63.64%) patients out of 44 hypothyroid patients had frank diabetes. 10 patients (22.71%) had impaired glucose tolerance. These findings could possibly be due to late onset of type-I diabetes mellitus in these subset of older age group population and tilt of the balance more towards reduction in disposal of glucose to skeletal muscle and adipose tissue than towards reduction in gluconeogenesis.^{V'P}. Whereas in hyperthyroidism, maximum number of patients (57%) had random BSL < 140 mg/dl and 12 patients (43%) had random BSL > 140 mg/dl. In previous studies it has been suggested that due to increased turnover of insulin, hyperglycemia is seen in patients of hyperthyroidism.^{i'V'}

Conclusion:

Hypothyroidism was associated with high serum cholesterol levels whereas maximum patients with hyperthyroidism had normal serum cholesterol levels.

References:

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