

LIPID PROFILE IN OBESE HYPOTHYROID WOMEN RECEIVING THYROXINE – A CROSS SECTIONAL STUDY

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ABSTRACT

INTRODUCTION

We evaluated serum lipids in obese hypothyroid women receiving L-thyroxine hormone.

METHODS

A total of 55 obese hypothyroid women receiving levothyroxine treatment, between 20-55 years were included. Blood samples were assessed for thyroid function markers T3, T4, TSH, and serum lipids total cholesterol (TC) and triglycerides (TG) and Low density lipoprotein (LDL).

RESULTS

TSH level was significantly increased and T3, T4 concentrations were significantly decreased in clinical hypothyroid patients as compared with euthyroids. Lipid parameters such as TC, TG and LDL were significantly higher in hypothyroid patients. None of the thyroid markers correlated with lipid parameters significantly.

CONCLUSION

Lipid parameters such as TC, TG and LDL were significantly higher in hypothyroid patients. None of the thyroid function markers correlated significantly with lipid parameters.

KEYWORDS

Euthyroid, Overt Hypothyroidism, L thyroxine, Lipid profile.

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INTRODUCTION: Thyroid diseases are one of the habitually seen endocrine disorders worldwide. About 42 million people in India suffer from varied thyroid disorders.⁽¹⁾ Thyroid hormones significantly affect lipoprotein metabolism as well as some CVD risk factors, thus influencing the overall CVD risk.^(2,3) The commonest underlying cause of CAD is atherosclerosis for which dyslipidaemia has been identified as one of the major risk factor.^(4,5) The relationship between high serum total and LDL cholesterol as important risk factors for CAD development are well known. Hypothyroidism has been found to be a very important risk factor for secondary hypercholesterolemia. Hence few studies found the prevalence of hypothyroidism varies depending on geographical and the environmental factors such as dietary iodide, goitrogen intake, the genetic characteristic and the age distribution of the population.^(1,6) A linear positive association has been seen between thyroid-stimulating hormone (TSH) values in the reference range and concentrations of total serum cholesterol, LDL cholesterol, non-HDL cholesterol and TG, and a linear negative association with HDL cholesterol⁽⁷⁾ and dyslipidaemia in hypothyroidism is also accompanied by

significantly elevated phosphate levels.⁽⁸⁾ To this purpose we evaluated lipid profile abnormalities in hypothyroidism patients undergoing treatment for hypothyroidism in a tertiary care hospital in south India.

METHODS: In this cross-sectional study, a total of 55 obese hypothyroid women receiving levothyroxine treatment, between 20-55 years were included. Women whose BMI < 30 Kg/m² or not receiving thyroxine preparation or history of alcohol abuse, smokers, patients receiving drugs such as oestrogens, diuretics and beta-blockers, patients with familial or secondary dyslipidaemia, diabetic mellitus and renal, hepatic or other systemic diseases were excluded. A detailed clinical history of impaired thyroid function was recorded. The research protocol was approved by the institutional ethics committee and informed consents were obtained from all the patients. Fasting venous blood samples were collected, centrifuged promptly, and separated sera was stored at -20°C. TSH, T3, FT4 and TC, TG and LDL were measured using SEIMENS kits. Euthyroid subjects were defined as those having normal serum free T4 and TSH levels.

STATISTICAL ANALYSIS: Results were presented as Mean±SD. Comparison was made by unpaired t test by using SPSS statistics package. P value less than 0.001 was considered significant. Correlation between parameters was performed by Pearson correlation analysis.

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RESULTS: The hormonal profile of the study subjects was summarized in Table 1. Compared with euthyroids, the TSH level was significantly increased and T3, T4 concentrations were significantly decreased in clinical hypothyroid patients.

Lipid parameters such as TC, TG and LDL were significantly higher in hypothyroid patients. None of the thyroid markers correlated with lipid parameters significantly.

Parameter	Euthyroid	Hypothyroid	P value
N	20	35	-
Age (years)	38.9±8.1	41.6±7.8	p>0.05
BMI (kg/m ²)	33.3±1.55	34.8±1.3	p>0.05
TSH (mU/L)	2.7±0.8	5.6±1.5	P<0.05
FT4 (ng/dl)	2.8±0.42	1.58±0.12	P<0.05
FT3 (pg/dl)	3.44±0.21	2.61±0.42	P<0.05
Total Cholesterol (mg/dL)	212±44.6	240±36.4	P<0.05
Triglycerides(mg/dL)	110±46.4	200±42.8	P<0.05
LDL (mg/dL)	90±16.4	123±22.4	P<0.05

Table 1

DISCUSSION: Hypothyroidism is characterized by a decrease in both synthesis and catabolism of lipoproteins. The presence of hypercholesterolemia and hypertriglyceridemia in clinical hypothyroidism is well established by Erem. C.⁽⁹⁾ Sashi and Sharma et al documented that serum total cholesterol; triglycerides and LDL were significantly increased, while activity of hepatic lipase and concentration of HDL was decreased in subjects with Clinical hypothyroidism in comparison to euthyroid controls. Total cholesterol and LDL levels are increased in patients with clinical hypothyroidism.⁽¹⁰⁾ This is due to the decreased LDL-receptors' activity, resulting in decreased catabolism of LDL and IDL.⁽¹¹⁾ In euthyroid subjects, FT4, rather than TSH, is associated with risk of metabolic syndrome and its components.⁽¹²⁾

CONCLUSION: Lipid parameters such as TC, TG and LDL were significantly higher in hypothyroid patients. None of the thyroid function markers correlated significantly with lipid parameters.

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