Section: General Medicine

Original Research Article

CORRELATIVE STUDY OF DYSLIPIDEMIA AMONG HYPOTHYROIDISM AND TYPE-II DIABETES MELLITUS PATIENTS RETROSPECTIVE STUDY

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ABSTRACT

Background: Subclinical hypothyroidism is a potential risk factor for cardiac function and lipid metabolism. **Materials and Methods:** Out of 80 patients, sixty had type-II DM, sixty had hypothyroidism with type-II DM, and sixty had only hypothyroidism. These 120 patients' parameters were compared with 60 healthy volunteers (controlled group). Every patient undergone lipid profile, blood sugar level, and total count of the blood plasma. **Result:** All the biochemistry parameters of BSL and lipid profiles and the total count were higher in type-II DM with hypothyroidism except HDL. **Conclusion:** The present correlative study had a low thyroid function profile that is positively associated with lipid derangement in patients with DM and hypothyroidism. These findings or parameters will be a tool for clinicians/endocrinologists to treat such patients efficiently to avoid complications.

INTRODUCTION

India is a developing country, apart from facing the burden of infectious diseases.[1] It is known to face non-communicable diseases and other metabolic diseases such as cardiovascular disease, type II DM, hypertension, and thyroid dysfunction.[2]

In clinical presentation, hypothyroidism is varied and dependent on many factors. Thyroid disorders are common among women and are often associated with increased morbidity and mortality.[3] Subclinical hypothyroidism is a potential risk factor for cardiac function and lipid metabolism, and cardiovascular physiology is alarming if not treated, and in due course of time leads to cardiovascular diseases.[4] Hence, an attempt is made to correlate dyslipidemia among hypothyroidism and type-2 DM patients, and various parameters are evaluated.

MATERIALS AND METHODS

180 adult patients aged between 25 to 65 years visiting the Institute of Medical Sciences and Research Centre Mayani Taluk Khatav, Dist. Satara, Maharashtra-415102, were studied.

Inclusion Criteria

60 patients having only type-II DM, 60 patients having only hypothyroidism, and 60 patients having both type-II and hypothyroidism were selected after confirmation of their blood reports. The patients who gave their consent in writing for the study were selected.

Exclusion Criteria

Patients suffering with cardiovascular diseases and immunocompromised patients were excluded from the study.

Method: Three groups are made: 60 (sixty) DM, 60 (sixty) hypothyroidism, and 60 (sixty) DM & hypothyroidism were compared with 60 (sixty) healthy volunteers in the controlled group. Every patient was examined for plasma glucose and lipid profile and total count. These are carried out by using a fully automated biochemical analyzer. Turbo-chem (by Tyrbochem Awareness Technology Int.) reagents kits by CPC Diagnostics. Thyroid hormonal assay was estimated by chemiluminescence immunoassay methods.

The duration of the study was from 01-01-2016 to 30-06-2016

Statistical Analysis: Various parameters in all four groups were studied to get their mean values and standard deviation, and significant findings were noted. The statistical analysis was carried out in SPSS software. The ratio of male to female is 1:2.

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RESULTS

[Table 1] Mean values and standard derivations of lipid profiles in type-II DM, hypothyroidism – hypothyroidism with type-II DM, and controls

- Fasting Glucose: 192.6 (±2.70) in DM, 90.3 (±2.4) in Hypothyroidism, 189.76 (±1.70) in type-II with hypothyroidism, 86.4 (±1.00) in controlled (healthy) group
- TC (total count): 306.2 (±4.20) in type-II DM, 312.40 (±1.26) in Hypothyroidism, 353.90 (±1.80) in type-II DM with hypothyroidism, 172 (±1.33) in controlled.
- TG – Triglycerides: 325.4 (±4.26) in type-II DM, 317.6 (±2.30) in hypothyroidism, 348.04 (±24.12) in type-II DM with hypothyroidism, 168.52 (±1.68) in controlled.
- VLDL: 63.60 (±0.90) in type-II DM, 61.30 (±0.42) in hypothyroidism, 69.72 (±1.05) in type-II DM and hypothyroidism, 33.64 (±0.32) in controlled.
- LDL: 213.90 (±4.8) in type-II DM, 203.2 (± 1.60) in Hypothyroidism, 233.2 (±4.06) in type-II DM with hypothyroidism, 99.52 (±0.26) in controlled group.
- HDL: 28.22 (±0.20) in type-II DM, 38.54 (±0.18) in Hypothyroidism, 30.92 (±0.16) in type II DM with hypothyroidism, 40.32 (±0.40) in controlled group.
- TSH: 3.86 (±0.6) in type-II DM patients, 20.04 (±1.50) hypothyroidism, 23.90 (±1.36) in type-II DM with hypothyroidism, 3.92 (±0.12) in controlled.

Table 1: Mean values and standard deviations of lipid profiles in type-II DM, Hypothyroidism and controlled

Particular	Glucose Fasting mg/dl	TC mg/dl	TG mg/dl	VLDL	LDL	HDL	TSH
Type-II DM	192.6 (±2.70)	306.2 (± 4.20)	325.4 (±4.26)	63.60 (±0.90)	213.90 (± 4.8)	28.22 (±0.20)	3.86 (±0.6)
Hypothyroidism (Hy)	90.33 (± 2.40)	312.20 (±1.20)	317.6 (±2.30)	61.30 (±0.42)	203.2 (±1.60)	38.54 (±0.18)	20.04 (±1.50)
Type-II DM & with hypothyroidism	189.76 (±1.70)	353.90 (±1.90)	348.04 (±24.12)	69.72 (±4.05)	233.2 (±4.06)	30.92 (±0.16)	23.90 (±1.30)
Controlled group (Normal)	86.4 (±1.00)	172 (±1.33)	168.52 (±1.68)	33.64 (±0.32)	99.52 (±0.26)	40.32 (±0.40)	3.92 (±0.12)

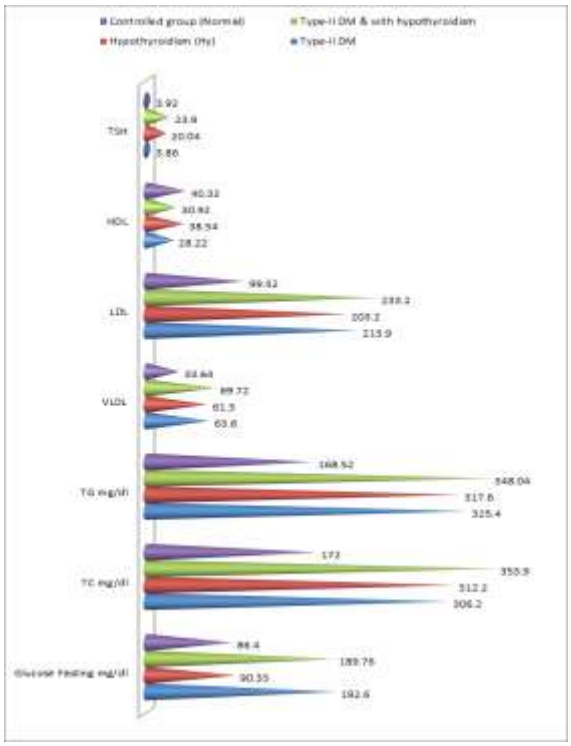

Figure 1: Mean values and standard deviations of lipid profiles in type-II DM, Hypothyroidism and controlled

DISCUSSION

Present a correlative study of dyslipidemia among hypothyroidism and type-II DM patients of the Maharashtra population. Fasting glucose was 192.6 (±2.70) in DM, 90.3 (±2.4) in hypothyroidism, 189.76 (±1.70) in type II with hypothyroidism, and 86.4 (±1.00) in the controlled group. Total count (TC) 306.2 (±4.20) in type-II DM, 312.40 (±1.20) in hypothyroidism, 353.90 (±1.80) in type-II DM with hypothyroidism, and 172 (±1.33) in controlled. TG (Triglyceride) 325.4 (±4.26) in type-II DM, 317.6 (±2.30) in hypothyroidism, 348.04 (±24.12) in type-II DM with hypothyroidism, and 168.52 (±1.60) in controlled. VLDL – 63.60 (±0.90) in type-II DM, 61.30 (±0.42) in hypothyroidism, 69.72 (±1.08) in type-II DM and hypothyroidism, and 33.64 (±0.32) in controlled. LDL – 213.90 (±4.8) in type-II DM, 203.2 (±1.60) in hypothyroidism, 233.2 (±4.06) in type-II DM with hypothyroidism, and 99.52 (±0.26) in the controlled group. HDL – 28.22 (±0.20) in type-II DM, 38.54 (±0.18) in hypothyroidism, 30.92 (±0.16) in type-II DM with hypothyroidism, and 40.32 (±0.40) in the controlled group. TSH – 3.86 (±0.6) in type-II DM patients, 20.04 (±1.50) in hypothyroidism, 23.90 (±1.36) in type-II DM with hypothyroidism, and 3.92 (±0.12) in the controlled group. These findings are more or less in agreement with previous studies.[6-8]

Hypothyroidism and type II DM accompanying hypercholesterolemia and hypertension show a strong association with cardiovascular diseases, especially in adult women.[9] Dyslipidemia is a single risk factor for the development of cardiovascular diseases if not reduced. It was observed that overt hypothyroidism occurred with major changes in lipoprotein fractions, which lead to cardiovascular

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complications. The prevalence of low HDL cholesterol level indicates an increased level of triglycerides associated with endocrine disorders.[10] The hypercholesterolemia of hypothyroidism is a well-known risk factor for cardiovascular atherosclerotic disease that will aggravate both micro- and macroangiopathic systems in type II DM patients, leading to IHD (ischemic heart disease) and peripheral, neurovascular complications.

This study reveals that hypothyroidism and type II DM with dyslipidemia are associated with many more deleterious effects. Moreover, hypothyroidism in females may cause early menopause corroborated with dyslipidemic effects along with cholelithiasis also.[11] TSH has been significantly associated with high triglycerides in type-II DM that are related to visceral obesity and high risk of atherosclerosis susceptibility in type-II DM patients. Moreover, the positive correlation between TSH, TG, TC, and LDL may be due to the activation of autoimmunity that is involved in lipoprotein production. TSH is also involved in lipoprotein production. TSH is also involved in hepatic expression of hydroxymethyl glutaryl coenzyme reductase, which enhances cholesterol synthesis.

CONCLUSION

The present correlative study of dyslipidemia in type-II DM and hypothyroidism-suffering patients had elevated lipid profiles in type-II DM with hypothyroidism patients. It indicates that endocrine abnormalities are directly related to lipid profiles, causing atherosclerosis, obesity, and cholelithiasis. But this study demands further genetic, nutritional, hormonal, and pathophysiological studies because the exact pathogenesis of atherosclerosis is still unclear.

Limitation of study: Owing to remote location of research centre, small number of patients lack of latest techniques we have limited finding and results.

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