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Correlative study of Dyslipidemia among Hypothyroidism and type-II Diabetic Mellitus patients in Maharashtra Population

By

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Abstract

Background: Dyslipidemia is a common metabolic abnormality in thyroid disorders is clinically obvious and type-II DM with marked increase circulation in LDL leads to dual morbidities.

Method: Out of 120 patients, forty were type-II DM, forty Hypothyroidism with type-II DM, forty having only hypothyroidism. These 120 patients parameters were compared with 40 healthy volunteers (controlled group). Every patient's undergone lipid profile, blood sugar level and total count of the blood plasma.

Results: All the Biochemistry parameters of BSL and lipid profiles, Total count were higher in type-II DM with hypothyroidism except HDL.

Conclusion: The present correlative study had low thyroid function profile is positively associated with lipid de-arrange in patient with DM and hypothyroidism. These findings or parameters will be tool for clinician / Endocrinologist to treat such patients efficiently to avoid complication.

Keywords: Hypothyroidism, type-II DM, lipid profile, Maharashtra

Introduction

Diabetic Dyslipidemia is characterised by high level plasma triglyceride (TG), and low density lipoprotein (LDL), Concentrations with low level of high density cholesterol (HDL-C), due to reduced action of insulin at the tissue level or due to resistance [(1)]. Diabetic dyslipidemia particularly, if glycermic control is poor, which in turn is an important risk factor for coronary heart disease [(2)]. Hypothyroidism is also associated with hyper cholestremia, hyper-triglyceredemia with significant increase in total cholesterol concentration and increased level of LDL due to decreased receptor in the liver [(3)(4)].

In co-existing dyslipidemia with metabolic abnormalities in a combination of hormone induced hemodynamic alterations lead to cardio vascular disease [(5)]. Thyroid dysfunction and type-II DM are most common endocrine disorders ultimately targets cardio

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vascular systems and leads to morbidity and mortality but less attention is paid in the correlation of disorders hence attempt is made to evaluate these relations to avoid chronic morbidities.

Materials and Methods

120 adult patients aged between 25 to 65 years visiting to Bharati Hospital and Research Centre, Vidyapeeth Deemed University (BVMC) Pune, Maharashtra – 411043 were studied.

Inclusive Criteria: 40 patients having only type-II DM, 40 patients having only hypothyroidism and 40 patients having both type-II and hypothyroidism were selected for after confirmation of their blood report.

Exclusive Criteria: Patients suffering with cardio-vascular diseases and immune-compromised patients were excluded from study.

Method: Three groups are made 40 (forty) DM, 40 (forty) hypothyroidism and 40 (forty) DM & hypothyroidism were compared with 40 (forty) healthy volunteers controlled group.

Every patient was examined plasma glucose and lipid profile and total count. These are carried out by using fully automated biochemical analyser. Turbo-chem (by Tyrbochem Awareness technology int) Reagents kits by CPC diagnostics. Thyroid hormonal assay was estimated by chemiluminescence Immuno-assay methods.

Duration of study was May-2018 to June-2022.

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

Observations and 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 192.4 (±2.68) in DM, 90.2 (±2.3) in Hypothyroidism, 189.78 (±1.78) in type-II with hypothyroidism, 86.6 (±1.00) in controlled (healthy) group
- TC (total count) – 306.9 (±4.19) in type-II DM, 312.4 (±1.28) in Hypothyroidism, 353.89 (±1.85) in type-II DM with hypothyroidism, 173 (±1.32) in controlled.
- TG – Triglycerides 325.2 (±4.28) in type-II DM, 317.8 (±2.38) in hypothyroidism, 348.03 (±24.10) in type-II DM with hypothyroidism, 168.50 (±1.69) in controlled.
- VLDL – 63.59 (±0.89) in type-II DM, 61.29 (±0.40) in hypothyroidism, 69.70 (±1.07) in type-II DM and hypothyroidism, 33.68 (±0.30) in controlled.
- LDL – 213.89 (±4.6) in type-II DM, 203.4 (± 1.62) in Hypothyroidism, 233.4 (±4.03) in type-II DM with hypothyroidism, 99.53 (±0.28) in controlled group.
- HDL – 2819 in type-II DM, 38.82 (±0.19) in Hypothyroidism, 30.90 (±0.18) in type-II DM with hypothyroidism, 40.30 (±0.48) in controlled group.
- TSH – 3.88 (±0.8) in type-II DM patients, 20.06 (±1.52) hypothyroidism, 23.96 (±1.38) in type-II DM with hypothyroidism, 3.94 (±0.10) in controlled.

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Discussion

Present correlative study of dyslipdemia among hypothyroidism and type-II DM patients of Maharashtra population. Fasting Glucose 192.4 (±2.68) in DM, 90.2 (±2.3) in Hypothyroidism, 189.78 (±1.78) in type-II with hypothyroidism, 86.6 (±1.00) in controlled group. Total count (TC) 306.9 (±4.19) in type-II DM, 312.4 (±1.28) in Hypothyroidism, 353.89 (±1.85) in type-II DM with hypothyroidism, 173 (±1.32) in controlled. TG (Triglyceride) 325.2 (±4.28) in type-II DM, 317.8 (±2.38) in hypothyroidism, 348.03 (±24.10) in type-II DM with hypothyroidism, 168.50 (±1.69) in controlled. VLDL – 63.59 (±0.89) in type-II DM, 61.29 (±0.40) in hypothyroidism, 69.70 (±1.07) in type-II DM and hypothyroidism, 33.68 (±0.30) in controlled. LDL – 213.89 (±4.6) in type-II DM, 203.4 (± 1.62) in Hypothyroidism, 233.4 (±4.03) in type-II DM with hypothyroidism, 99.53 (±0.28) in controlled group. HDL – 2819 in type-II DM, 38.82 (±0.19) in Hypothyroidism, 30.90 (±0.18) in type-II DM with hypothyroidism, 40.30 (±0.48) in controlled group. TSH – 3.88 (±0.8) in type-II DM patients, 20.06 (±1.52) hypothyroidism, 23.96 (±1.38) in type-II DM with hypothyroidism, 3.94 (±0.10) in controlled group. These findings are more or less in agreement with previous studies [(6)(7)(8)].

Hypothyroidism and type-II DM accompanying hypercholestremia and hypertension shows strong association with cardio vascular diseases especially in adult women [(9)]. Dyslipedemia is a single risk factor for development of cardio vascular diseases if not reduced. It was observed that, overt hypothyroidism occurred with major changes in lipoprotein fractions which lead to cardio-vascular complications.

The prevalence of low HDL cholesterol level indicates increased level of hypertriglycerids associated with endocrine disorders [(10)]. The hypercholestremia of hypothyroidism is well known risk factor for cardio-vascular atherosclerotic disease that will aggravate both micro and macro angiopathic system in type-II DM patients leads to IHD (Ischemic heart disease) and peripheral, neuro, vascular complications.

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

Summary and Conclusion

Present correlative study of dyslipidemia in type-II DM and hypothyroidism suffering patients had elevated lipid profile in type-II DM with Hypothyroidism patients. It indicates that, endocrine abnormalities are directly related to lipid profile causing atherosclerosis, obesity, cholelithiasis. But this study demands further genetic, nutritional, hormonal, patho-physiological studies because exact patho-genesis of atherosclerosis is still unclear.

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Limitation of Study – Owing to tertiary location research centre, small number of patients and lack of latest techniques we have limited findings and results.

- This research paper was approved by Ethical committee of BVMC pune, Maharashtra-411043.
- No conflict of Interest
- No Funding

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	192-4 (± 2.68)	306.9 (±4.19)	325.2 (±4.28)	63.59 (±0.89)	213.89 (±4.6)	28.19 (±0.28)	3.88 (±0.8)
Hypothyroidism (Hy)	90.32 (±2.3)	312.48 (±1.28)	317.8 (±2.38)	61.29 (±0.40)	203.4 (±1.62)	38.52 (±0.19)	20.06 (±1.52)
Type-II DM & with hypothyroidism	189.78 (±1.78)	353.89 (±1.85)	348.03 (±24.10)	69.70 (±4.07)	233.4 (±4.08)	30.90 (±0.18)	23.96 (±1.38)
Controlled group (Normal)	86.3 (±1.00)	173 (±1.32)	168.50 (±1.69)	33.68 (±0.30)	99.53 (±0.28)	40.30 (±0.48)	3.94 (±0.10)

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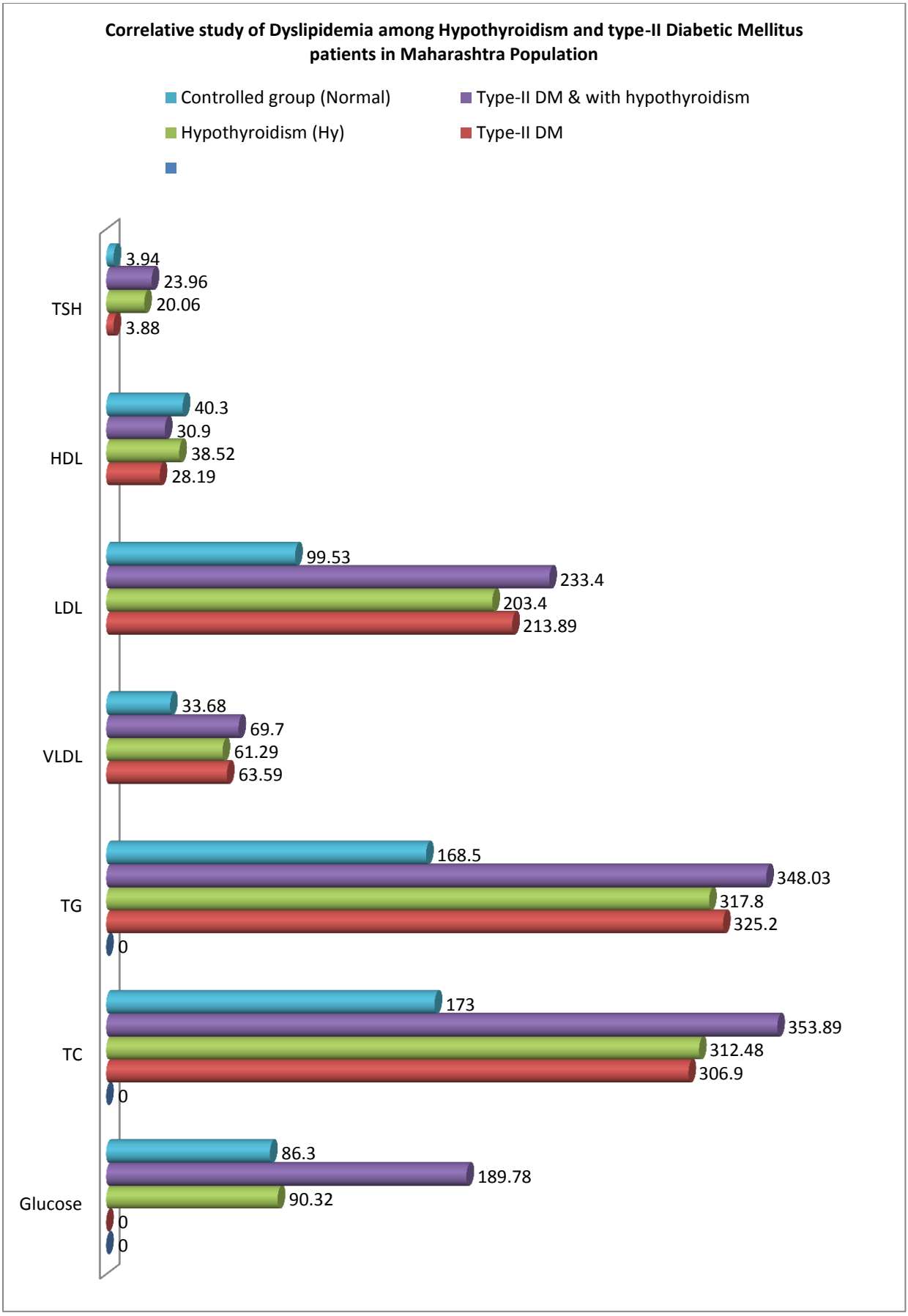

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References

1. Mooradian AD – dyslipidemia in type-II diabetes mellitus Nat. Clin. pract. Endocrinol Metabol. 2009, 5; 150-9.
2. Elder J, MeLclland A – The relationship between serum cholesterol and serum tryropin thyroxine and triaido thyronine concentrations in suspected hypothyroidism. Ann. Clin. Biochem. 1990, 27 (2); 110-3.
3. Stub JJ, Althous BU – Spectrum of subclinical and overt hypothyroidism. Effect on thyroptin, prolactin and thyroid reserve and metabolic impact on peripheral target tissues Am. J. Med. 1992, 92; 631-42.
4. O Brien T, Dineen SF – Hyperlipidemia in patients with primary and secondary hypothyroidism Mayo. Clin. Proc. 1993, 68; 860-6.
5. Shah SN – Thyroid disease in diabetes Mellitus J. Assoc. Phys. India. 1984, 32; 1057-9.
6. Snipeliska D, Ziaika P – Diabetes and hypertipidemia direct quantitative analysis in relation to atherosclerotic coronary disease J. Diabetic medicines 2012, 2 (1); 20-25.
7. Vibha U, Chittranjan V – Thyroid disorders in patients of hype-II Dm patients Ind. J. Clin. Biochem. 2013, 28 (4); 336-341.
8. Neto DM, Parisi MC – Relationship of thyroid dysfunction on lipid profile in cardiovascular disease Ind. Med. J. 2011, 5; 76-84.
9. Triolo M, Kwokernak AJ – Low normal thyroid function enhances plasma cholestryl ester transfer in hype-II DM, J, Atherosclerosis 2013, 228 (2); 466-701.
10. Archana Gupta, Neeti Agarwal – Study of lipid profile in patients of Hypothyroidism and correlation with incidences Gall stone IOSC J. of dental and Med. Sc. 2017, 16 (6); 42-45.
11. CEJ Udlong A, E Udan – Evaluation of thyroid function in diabetes Mellitus I calabar Niveria Ind. J. of clin. Bio. 2007, 122(2); 74-78.