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Research Article

**LIPID PROFILE DETERMINATION IN PATIENTS OF
HYPOTHYROIDISM AND ITS ABNORMALITIES*****Dr. Samman Khalid, *Dr. Muhammad Faizan Adeel Khan, *Dr. Mariam Tariq**
*Rawalpindi Medical College, Rawalpindi Pakistan**Abstract:****Objective:** To estimate lipid profile in patients with primary hypothyroidism.**Work Place and Duration:** In the Endocrinology Department, Benazir Bhutto Hospital, Rawalpindi for six months duration from August 2016 to January 2017.**Study Design:** An Observational Study.**Methods:** Eighty subjects were taken for this study. Forty patients were from primary hypothyroidism (B) and the remaining 40 from healthy control group (A). 40 patients (TSH > 10 μ lU) diagnosed as primary hypothyroidism were selected between 18 and 40 years of age. Age and sex matched 40 euthyroid patients were selected as the control group. Patients with diabetes mellitus and ischemic heart disease were not selected for the study. People under pharmacological treatment were also excluded, which could alter lipid metabolism and thyroid function. During the night (0800-1000), 10 ml of Antecubital venous blood samples were taken for fast (12-14 hours) and Serum sample was taken after 30 minutes for the thyroid profile. Serum samples were analyzed for T3, T4, TSH, TC, TG, LDL-c and HDL-c.**Results:** Serum TC levels were greater significantly in primary hypothyroid patients than in control group. In patients with primary hypothyroidism, serum TG levels increased compared to the control group (very significant).**Conclusion:** Serum LDL-c levels were higher significantly in primary hypothyroid patients than control group.**Key words:** hypothyroidism, HDL, LDL.**Corresponding author:*****Dr. Samman Khalid,**
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INTRODUCTION:

Thyroid gland disorders are the very common endocrine abnormalities. Abnormalities in thyroid function affect 5-10% of people throughout life. Thyroid diseases are widespread, destructive, expensive, treatable and can also be prevented. Thyroid hormones affect almost all aspects of metabolism. In the lipid metabolism regulation an important factor is the thyroid condition is and the abnormalities of the thyroid gland affect the lipoproteins metabolism and are linked with variations in serum lipid levels. Hypothyroidism is the generic term used to expose body tissues to abnormal thyroid hormones. Hypothyroidism is a risk factor for atherosclerosis and its potential relationship with atherogenic lipid profile for coronary heart disease. Hypothyroid conditions can cause early atherosclerosis.

METHODOLOGY:

This Observational study was taken place in the Endocrinology Department, Benazir Bhutto Hospital, Rawalpindi for six months duration from August

2016 to January 2017. Eighty patients were included in this study. Forty patients were from primary hypothyroidism (B) and the remaining 40 from healthy control group (A). Forty patients with primary hypothyroidism (TSH > 10 μ Iu) and 18-40 years of age were selected. Age and sex matched 40 euthyroid patients were selected as the control group. Patients with diabetes mellitus and ischemic heart disease were not selected for the study. People under pharmacological treatment were also excluded, which could alter lipid metabolism and thyroid function. No woman was postmenopausal. Individuals with a smoking habit and a family history of dyslipidemia were also excluded. During the night (0800-1000), 10 ml of Antecubital venous blood samples were taken for fast (12-14 hours) and Serum sample was taken after 30 minutes at rest and centrifugation at 4000 rpm for ten minutes was done for the thyroid profile. Serum samples were analyzed for T3, T4, TSH, TC, TG, HDL, LDL.

RESULTS:

The detail of results are given in tables 1 and 2

Table 1: Comparison of T3, T4, TSH in groups A & B

Tests	Control Group (A) (n = 40)	Patient Group (B) (n = 40)	Level of Significance (A vs B)
T 3	17.8 \pm 0.3	0.60 \pm 0.3	P<0.01(HS)
T 4	114.1 \pm 24.2	19.9 \pm 8.1	P<0.01(HS)
TSH	3.4 \pm 0.8	109.3 \pm 23.9	P<0.01(HS)

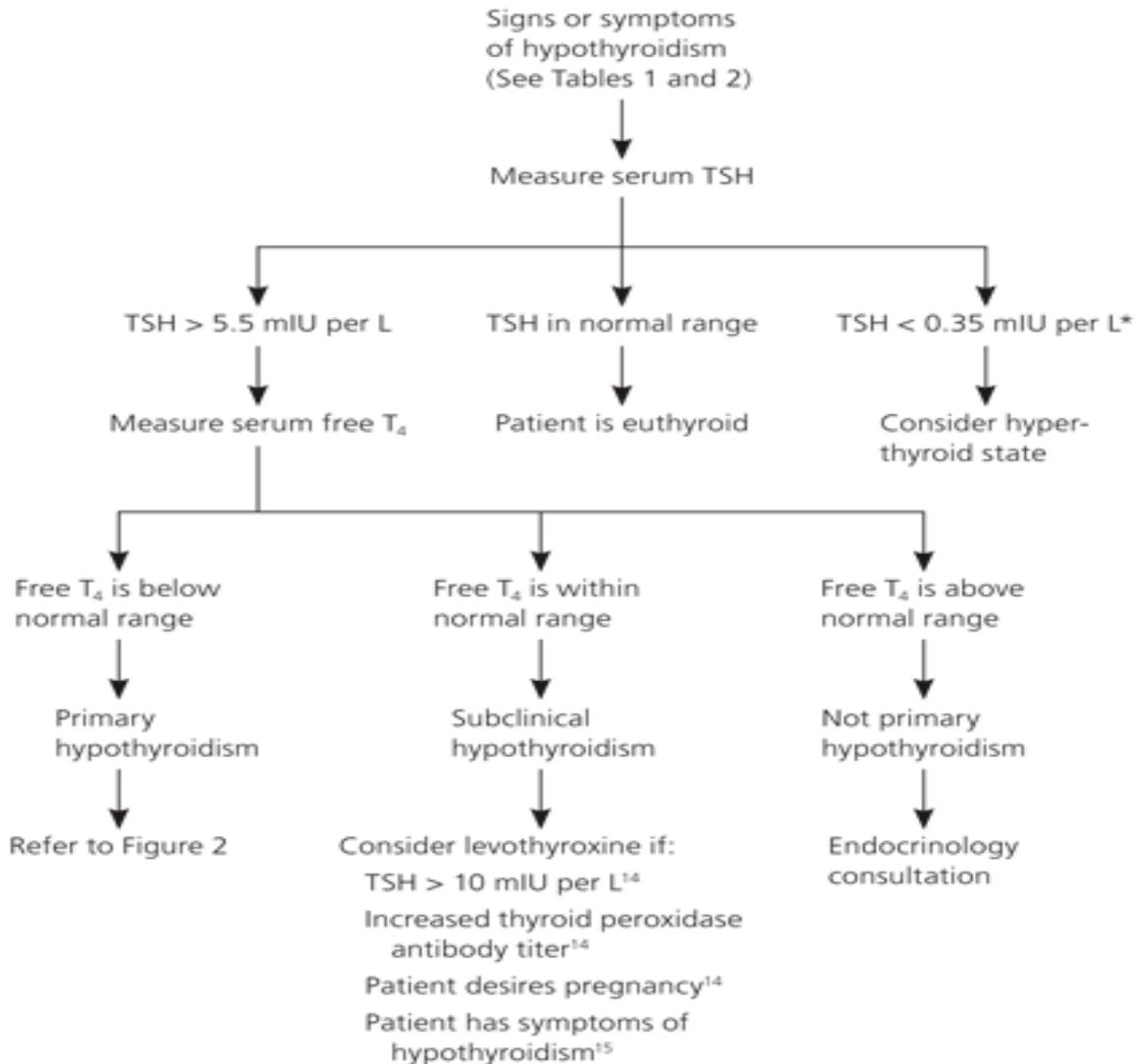
Table 2 : Comparison of TC, TG, HDL-c, LDL-c in groups A & B

Tests	Control Group (A) (n= 40)	Patient Group (B) (n = 40)	Level of Significance(A vs B)
Cholesterol	178.5 \pm 12.9	304.9 \pm 45.4	P<0.01(HS)
Triglyceride	125.8 \pm 11.2	209.5 \pm 43.8	P<0.01(HS)
HDL-C	44.6 \pm 5.7	47.5 \pm 12.1	P>0.05(NS)
LDL-C	106.3 \pm 13.6	213.1 \pm 41.7	P<0.01(HS)

DISCUSSION:

In this study, it was found that increased total serum cholesterol (TC) was statistically significant in patients with primary hypothyroidism (group B) according to the difference between p control group (A) and group A and B <0.01). Engler and Riesen (1993) Martinez et al. (1998) Ness et al. (1998), Petersson and Kjellström (2001) Morris (2001) are also seen, and the results of this analysis are linked with those of Pazos et al (1995). level increase. This increase in CT in patients with primary

hypothyroidism may be because of LDL receptor protein effects. There is a decrease in the activity and number of the LDL receptor protein in patients of hypothyroidism,. In this study, a serum level was determined. LDL-C was significantly higher in patients with primary hypothyroidism (group B) than the control group (A) and the difference between A and B (p <0, 01).The Signs and Symptoms of Hypothyroidism is shown in Figure.



*—TSH reference ranges may vary depending on the laboratory.

The results of this study were in favor of higher observed levels of LDL-C in patients with first hypothyroidism (Diekman et al., 2000) Huesca et al. (2002). This increase in LDL-c in patients with primary hypothyroidism is because of the effect on the LDL-c receptor. Thyroid hormones regulate lipid metabolism by various mechanisms, but the LDL receptor pathway may play an important role. It was not statistically significant ($p > 0.05$) that serum levels of HDL-c decreased in patients with normal increased or decreased in patients with primary hypothyroidism (group B) according to the difference between control group (A) and A and B ($p > 0.05$). The results of this study are consistent with the results of Erem et al. (1999) and Ascott (1994) also reported a decrease in HDL-c levels. However, normal HDL-c levels in this study were supported by

Verdugo et al. (1987). These contradictory (increased, normal or decreased) HDL-c results may be related to thyroid status and may be related to changes in lipolytic enzymes. In particular, the activity of liver lipase (HL) is low in severe hypothyroidism. Since HL plays an important role in the regulation of HDL-c, a significant change in the plasma concentration of HDL-c may be expected depending on the state of the thyroid. HL activity increases after hormone replacement therapy. In this study, serum triglyceride levels in patients with primary hypothyroidism (group B) were increased compared to the control group (A) and the variations among group A and B was statistically significant ($p < 0.01$). The results of this analysis were reported by Martinez et al. (1998) 5; A higher Triglyceride level was also observed in patients with primary

hypothyroidism. In patients rise in TG levels with primary hypothyroidism was because of its effect on enzymes that play a role in TG metabolism.

CONCLUSION:

In patients with primary hypothyroidism, enzyme lipoprotein lipase activity seems to be decreased. This decline in LDL activity may be the cause of raised TG level.

REFERENCES:

- Nicholls, S.J., Lincoff, A.M., Bash, D., Ballantyne, C.M., Barter, P.J., Davidson, M.H., Kastelein, J.J., Koenig, W., McGuire, D.K., Mozaffarian, D. and Pedersen, T.R., 2018. Assessment of Omega-3 Carboxylic Acids in Statin Treated Patients with High Levels of Triglycerides and Low Levels of High Density Lipoprotein Cholesterol: Rationale and Design of the STRENGTH Trial. *Clinical cardiology*.
- Han, J.C., Reyes-Capo, D.P., Liu, C.Y., Reynolds, J.C., Turkbey, E., Turkbey, I.B., Bryant, J., Marshall, J.D., Naggert, J.K., Gahl, W.A. and Yanovski, J.A., 2018. Comprehensive Endocrine-Metabolic Evaluation of Patients with Alström Syndrome Compared to BMI-Matched Controls. *The Journal of Clinical Endocrinology & Metabolism*.
- Carvalho, G.A., Paz-Filho, G., Junior, C.O.M. and Graf, H., 2018. MANAGEMENT OF ENDOCRINE DISEASE: Pitfalls on the replacement therapy for primary and central hypothyroidism in adults. *European journal of endocrinology*, pp.EJE-17.
- Srivastava, Swati, Gunjan Sharma, Monika Rathore, Ashutosh Chaturvedi, Prakash Keswani, G. N. Saxena, Aradhana Singh, and Raman Sharma. "A Crossover Study Evaluating Effect of Timing of Levothyroxine on Thyroid Hormone Status in Patients of Hypothyroidism." *Journal of The Association of Physicians of India* 66 (2018): 37.
- Ghosh, Amrita, Dipankar Kundu, Faizur Rahman, Md Ezaz Zafar, K. R. Prasad, H. K. Baruah, and Tapan Mukhopadhyay. "Correlation of lipid profile among patients with hypothyroidism and type 2 diabetes mellitus." *BLDE University Journal of Health Sciences* 3, no. 1 (2018): 48.
- Mourtzinis, Georgios, Thomas Kahan, Kristina Bengtsson Boström, Linus Schiöler, Louise Cedstrand Wallin, Per Hjerpe, Jan Hasselström, and Karin Manhem. "Relation Between Lipid Profile and New-Onset Atrial Fibrillation in Patients With Systemic Hypertension (From the Swedish Primary Care Cardiovascular Database [SPCCD])." *The American journal of cardiology* (2018).
- Kutkienė S, Petrulionienė Z, Laucevičius A, Cerkauskienė R, Staigytė J, Saulytė A, Petrulionytė E, Gargalskaitė U, Skiauterytė E, Matuzevičienė G, Kovaite M. Lipid profile evaluation and severe hypercholesterolaemia screening in the middle-aged population according to nationwide primary prevention programme in Lithuania. *Atherosclerosis*. 2018 Oct 1;277:267-72.
- De Paola, Luciano, Marco Vatrano, Giordano Placida, Pietro Gangemi, Giuseppina D'onofrio, Cinzia Donato, Ramona Nicotera, Giuseppe Coppolino, and Angela Rosa Pinciarioli. "SP576 ASSESSMENT OF INTRADIALYTIC HYPOTENSION: A NEW METHOD DERIVED FROM INTRADIALYTIC BLOOD PRESSURE VARIABILITY." *Nephrology Dialysis Transplantation* 33, no. suppl_1 (2018): i541-i541.
- Samani, Sulmaz Tarakameh, Bahman Mosallanejad, Mohammad Razi Jalali, Javad Jamshidian, and Reza Avizeh. "Comparative evaluation of the effects of ezetimibe and atorvastatin on serum lipid profile changes in experimental hypercholesterolemia in cat." *Comparative Clinical Pathology* 27, no. 1 (2018): 117-122.
- Feller, M., Snel, M., Moutzouri, E., Bauer, D.C., de Montmollin, M., Aujesky, D., Ford, I., Gussekloo, J., Kearney, P.M., Mooijaart, S. and Quinn, T., 2018. Association of Thyroid Hormone Therapy With Quality of Life and Thyroid-Related Symptoms in Patients With Subclinical Hypothyroidism: A Systematic Review and Meta-analysis. *JAMA*, 320(13), pp.1349-1359.
- Vijayan, V., Jayasingh, K., Jayaraman, G., Green, S.R. and Deyagarasan, E., 2018. Assessment of carotid intima-media thickness in hypothyroidism and the effect of thyroid replacement therapy. *International Journal of Advances in Medicine*, 5(2), pp.281-288.
- Zang, Shufei, Jin Chen, Yu Song, Lang Bai, Jinjun Chen, Xiaoling Chi, Fangping He et al. "Haptoglobin genotype and vitamin E versus placebo for the treatment of nondiabetic patients with nonalcoholic steatohepatitis in China: a multicenter, randomized, placebo-controlled trial design." *Advances in therapy* 35, no. 2 (2018): 218-231.
- Shalitin, Shlomit, Lihl Pertman, Michal Yackobovitch-Gavan, Isaac Yaniv, Yael

- Lebenthal, Moshe Phillip, and Jerry Stein. "Endocrine and Metabolic Disturbances in Survivors of Hematopoietic Stem Cell Transplantation in Childhood and Adolescence." *Hormone research in paediatrics* 89, no. 2 (2018): 108-121.
14. Xu, Da-Hai, Chang Su, Zhong-Ying Miao, Mei-Shan Jin, Guang Chen, Xian-Ying Meng, and Gui-Min Wang. "Predictive role of high-density lipoprotein and body mass index in differentiated thyroid carcinoma." *INTERNATIONAL JOURNAL OF CLINICAL AND EXPERIMENTAL MEDICINE* 11, no. 3 (2018): 2172-2182.
15. Chittawar, Sachin, Apeksha Nagdeote, Abhinav Nair, Krishna Kumar Kawre, and Deep Dutta. "Spectrum of clinical symptomatology and its resolution following levothyroxine supplementation in primary and subclinical hypothyroidism: An Indian perspective." *Thyroid Research and Practice* 15, no. 1 (2018): 29.