

# Effects of Primary Hypothyroidism on Lipid Profile: A Prospective Study

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## ABSTRACT

**Aim:** To evaluate the effects of primary hypothyroidism on lipid profile.

**Settings:** The study was conducted in atomic energy center, Mayo hospital, Lahore.

**Study design:** Prospective observational study.

**Methodology:** Sixty subjects were recruited for this study. Patient group (B) was of 20 subjects, while the remaining 40 subjects included were healthy subjects constituting control group (A). Study subjects were selected from the individuals who were referred to Atomic Energy Medical Centre (CINUM), Mayo Hospital Lahore.

**Results:** serum cholesterol level, LDL, Serum triacylglycerol levels are increase significantly ( $P < 0.01$ ) in Patients of primary hypothyroidism.

**Keywords:** Primary hypothyroidism, LDL, HDL

## INTRODUCTION

Overt hypothyroidism is associated with an increased risk of cardiovascular diseases<sup>1</sup>. Hypothyroidism is the generic term for exposure of the body tissues to a subnormal amount of thyroid hormones. Hypothyroidism is a risk factor for atherosclerosis and coronary heart disease due to its potential association with atherogenic lipid profile<sup>2</sup>. Hypothyroid condition can even cause premature atherosclerosis. In humans untreated hypothyroidism is a frequent cause of reversible hyperlipidaemia<sup>3</sup>.

## METHODOLOGY

Sixty subjects (both males and females) were recruited for this study. Patient group (B) was of 20 subjects, while the remaining 40 subjects included were healthy subjects constituting control group (A). Study subjects were selected from the individuals who were referred to Atomic Energy Medical Centre (CINUM), Mayo Hospital Lahore. 20 subjects diagnosed as patients of primary hypothyroidism (TSH  $> 10 \mu\text{IU}$ ) with age range 18-40 years were selected. The subjects having diabetes mellitus and ischemic were excluded. The individuals who were on any drug therapy that could alter lipid metabolism and thyroid function were also excluded. Samples were analyzed for the following biochemical parameters; Triiodothyronine (T3), Thyroxine (T4), Thyroid stimulating hormone (TSH), Total Cholesterol (TC), Triacylglycerol (TAG), Low density cholesterol (LDL), High density cholesterol (HDL)

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## RESULTS

Table 1: Thyroid Function Tests in Primary Hypothyroidism

Tests	Control Group (A) (n=40)	Patient Group (B) (n=20)	Statistical Analysis (A Vs B)
T3	1.8 ± 0.3	0.6 ± 0.3	P<0.01 (HS)
T4	114.1 ± 24.2	19.9 ± 8.1	P<0.01 (HS)
TSH	3.4 ± 0.8	109.3 ± 23.9	P<0.01 (HS)

Table 2: Lipid Profile in Primary Hypothyroidism

Tests	Control Group (A) (n=40)	Patient Group (B) (n=20)	Statistical Analysis (A Vs B)
Cholesterol	178.5 ± 12.9	304.9 ± 45.4	P<0.01 (HS)
TAG	125.9 ± 11.2	209.5 ± 43.8	P<0.01 (HS)
LDL	106.3 ± 3.6	213.1 ± 41.7	P<0.01 (HS)
HDL	44.6 ± 5.7	47.5 ± 12.1	P>0.05 (NS)

## DISCUSSION

In the present study, serum total cholesterol (TC) was found to be increased in patients of primary hypothyroidism. When compared with control group, the difference between group A and B was highly significant statistically ( $p < 0.01$ ). The findings of this study are consistent with results of Petersson and Kjellstrom (2001)<sup>4</sup> who also observed increased TC level in patients of primary hypothyroidism.

In the present study, serum LDL levels were found to be increased in patients of primary hypothyroidism. When compared with control group (A), the difference between group A and B was highly significant statistically ( $p < 0.01$ ). The findings of this study are in favour of results of Huesca et al (2002)<sup>5</sup> who also observed increased LDL levels in patients of primary hypothyroidism.

In the present study, serum HDL levels were found to be increased. When compared with control group and the difference between A and B was non-significant statistically ( $p>0.05$ ). The increased HDL levels in this study are in consistent with results of Diekman et al (2000)<sup>6</sup> who reported increased HDL level.

In the present study, serum Triacylglycerol (TAG) levels were found to be increased in patients of primary hypothyroidism (group B). When compared with control group (A), the difference between group A and B was highly significant statistically ( $p<0.01$ ). The findings of this study are consistent with the results of Petersson and Kjellstrom (2001)<sup>4</sup> who also observed higher Triacylglycerol level in patients of primary hypothyroidism.

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