



CORONARY HEART DISEASE;

TO FIND CORRELATION AMONG TOTAL CHOLESTEROL, TRIGLYCERIDES, HIGH DENSITY LIPOPROTEIN CHOLESTEROL, LOW DENSITY LIPOPROTEIN CHOLESTEROL IN OFFSPRINGS OF PARENTS HAVING CORONARY HEART DISEASE.

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ABSTRACT... Objective: This study was done to find any correlation among total cholesterol, triglycerides, low density lipoprotein cholesterol and high density lipoprotein cholesterol estimated in serum of offsprings of coronary heart disease patients. **Study Design:** A cross sectional comparative study. **Patients and Methods:** Two hundred and fifty (250) subjects having parents with coronary heart disease were selected from Punjab Institute of Cardiology Lahore. The serum total cholesterol, triglycerides, low density lipoprotein cholesterol, and high density lipoprotein cholesterol were estimated. Coefficient of variation was calculated to find whether observations in one series vary correspondingly with observations in another series. **Results:** Highly significant positive correlation was found between total cholesterol and triglycerides, and, total cholesterol and low density lipoprotein cholesterol. Highly significant negative correlation was found between low density lipoprotein cholesterol and high density lipoprotein cholesterol. Correlation between TG and LDL-c was also significant. **Conclusions:** Serum total cholesterol, triglycerides, low density lipoprotein cholesterol and high density lipoprotein cholesterol have strong association with one and other. For prediction, prevention and management of coronary heart disease it is important to estimate and observe the correlation among these parameters.

Key words: Coronary heart disease (CHD), Total cholesterol (TC), Triglycerides (TG)

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INTRODUCTION

Lipid abnormalities are known risk factors for developing coronary heart disease (CHD)¹.

Increased serum total cholesterol (TC) level is a recognized risk factor in causation of CHD². Low density lipoprotein cholesterol (LDL-c) is considered a sound marker of CHD³. Triglycerides (TG) increase in serum have established role in CHD development⁴. High density lipoprotein cholesterol (HDL-c) has inverse relation with CHD development, increased HDL-c level decreases and decreased HDL-c level increases the chance of having CHD⁵.

The present study was designed to find any correlation among TC, TG, LDL-c and HDL-c levels in offsprings of parents having CHD.

PATIENTS AND METHODS

Two hundred and fifty (250) subjects having parents with CHD were selected from Punjab Institute of Cardiology Lahore.

The study was carried in adolescent group. World Health Organization (WHO) puts adolescence from 11-21 years⁶.

CHD was diagnosed in parents on the basis of clinical findings, electrocardiography and biochemical findings including creatine kinase (CK), creatine kinase MB (CKMB), aspartate aminotransferase (AST) and lactate dehydrogenase (LDH). Subjects suffering from diabetes mellitus, thyrotoxicosis, hypertension and hepatitis were excluded from study. 5ml blood was withdrawn aseptically and serum was obtained after clotting and centrifugation. Serum was analyzed on chemistry analyzer using commercially purchased kits. The serum total cholesterol (TC) was estimated by cholesterol oxidase method (CHOD). The serum triglycerides (TG) was estimated by glycerophosphate oxidase method. Serum low density lipoprotein cholesterol (LDL-c) was estimated by CHOD method after heparin precipitation. High density lipoprotein cholesterol (HDL-c) was estimated by CHOD

method after precipitation by phosphotungstic acid and Mn.chloride.

To find the correlation among TC, TG, LDL-c and HDL-c Pearson's correlation coefficient is computed using SPSS software. Student's 't' test was applied to find the significance of the correlation.

RESULTS AND OBSERVATIONS

TC, TG, LDL-c and HDL-c of 250 subjects was determined. 137 (54.8%) subjects were males and 113 (45.2%) subjects were females. Male to female ratio was 1.21:1. Mean \pm SD age in males was 15.60 ± 3.09 , mean \pm SD age in females was 15.79 ± 3.6 and mean \pm SD age in all the subjects was 16.01 ± 2.89 .

Mean \pm TC was 179.72 ± 10.04 , TG was 161.73 ± 50.66 , LDL-c was 107.22 ± 28.75 and HDL-c was 40.00 ± 8.69 .

A highly significant positive correlation was found between TC and TG ($r = 0.497$, $P < 0.01$) and between TC and LDL-c ($r = 0.866$, $P < 0.01$). A negative correlation was found between TC and HDL-c although not significant statistically ($r = -0.101$, $P > 0.05$). Correlation between TG and LDL-c was also significant statistically ($r = 0.151$, $P < 0.05$). A highly significant negative was found between LDL-c and HDL-c ($r = -0.399$, $P < 0.01$). Correlation was found between TG and HDL-c although not significant statistically ($r = 0.069$, $P > 0.05$).

Correlation Between	r. Value	Significance
TC and TG	0.497	HS ($P < 0.01$)
TC and LDL-c	0.866	HS ($P < 0.01$)
TC and HDL-c	-0.101	NS ($P > 0.05$)
TG and LDL-c	0.151	S ($P < 0.05$)
TG and HDL-c	0.069	NS ($P > 0.05$)
LDL-c and HDL-c	-0.399	HS ($P < 0.01$)

Table-I. Correlation among total cholesterol (TC), triglycerides (TG), high density lipoprotein cholesterol (HDL-c) and low density lipoprotein cholesterol (LDL-c) in offsprings of coronary heart disease patients.

Key: HS: Highly Significant,
NS: Non Significant, S: Significant

DISCUSSION

The present study focuses on finding any correlation among TC, TG, LDL-c and HDL-c determined in serum of offsprings of parents having coronary heart disease. A statistically highly significant positive correlation was found between serum TC and TG and between serum TC and LDL-c. A statistically significant negative correlation was found between LDL-c and HDL-c. A negative correlation was found between TC and HDL-c although not significant statistically. Correlation between TG and LDL-c was also significant statistically. Correlation was found between TG and HDL-c although not significant statistically.

Serum LDL-c incorporates 70% of serum TC, and therefore increase in TC has a positive correlation with LDL-c⁷. In familial hypercholesterolemia (FH) there is decreased cellular uptake of LDL-c by hepatocytes because of deficiency or defect of LDL-c receptors, this in turn leads to reduced inhibition of 3-hydroxy 3 methylglutaryl COA reductase (HMGCoA) and increased biosynthesis of cholesterol, hence there is increase serum TC and LDL-c⁸.

A positive correlation between serum TC and TG may occur in conditions like familial combined hyperlipidemia which is characterized by excessive hepatic production of ApoB and therefore LDL-c. This condition is also associated with VLDL and TG synthesis⁷. Both TC and TG also may be increased in type III hyperlipoproteinemia and in diabetes mellitus^{8,9}.

Inverse correlation between TC and HDL-C occurs, as those conditions which have increasing effect on LDL-c, have lowering effect on HDL-c for example diabetes mellitus, smoking and inherited disorders like familial combined hyperlipidemia^{8,10}.

CONCLUSIONS

The serum TC, TG, LDL-c and HDL-c have strong correlation with each other in offsprings of coronary heart disease patients hence it is very important to estimate all of these and correlate with each other for prediction, prevention and

management purposes.

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Success is walking from failure to failure with no loss of enthusiasm.

Winston Churchill

