REPORT

PLASMA LIPID PROFILE IN SARCOMA PATIENTS

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ABSTRACT

Objective of the present study was to observe plasma lipid profile (triglycerides, cholesterol, LDL-cholesterol and HDL-cholesterol) in sarcoma patients. 120 subjects were included in the project. The subjects comprised of two groups; first as Controls (60 in number) and the second as Patients of Sarcoma (also 60 in number). Fasting blood samples were collected for estimation. Sarcoma patients showed highly significant ($P<0.01$) decrease, when compared with the normal control subjects.

Keywords: Lipid profile, sarcoma.

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INTRODUCTION

Cancer of the connective tissues is known as Sarcoma. Sarcoma may be divided into different types according to its origin (Robbins *et al.,* 2003*)*.

Lipids are carried in body fluids with the help of lipoproteins (Edwards *et, al.,* 1995 and Fischbach, 1984), chylomicrons transport of triglycerides from intestine to all cells. Very low density lipoproteins (VLDL) are involved in the transportation of triglycerides from liver to other cells. Low density lipoproteins (LDL) are responsible for the transport of cholesterol from liver to the cells and high density lipoproteins (HDL) are involved for the transport of cholesterol from cells to the liver. Chylomicrons and very low density lipoproteins are rapidly catabolized (Heeren *et, al.*, 2003; Murray *et al.,* 2000). Thus triglycerides, cholesterol, LDL–cholesterol and HDL–cholesterol constitute Plasma Lipid Profile.

Researchers have reported association of plasma/serum lipids and lipoproteins with different cancers. As neoplastic disease is related to new growth, there is a greater utilization of lipids including total cholesterol, lipoproteins and triglycerides for new membrane biogenesis. Cells fulfill these requirements either from circulation, by synthesis through the metabolism or from degradation of major lipoprotein fractions like VLDL, LDL or HDL. The plasma concentrations of lipids are not the single additive function of intake, utilization and biosynthesis because of its continuous cycling in and out of the blood stream (Patel *et al.*, 2004).

The objective of the present study was to investigate any relationship between plasma lipid profile (triglycerides, cholesterol, LDL-cholesterol and HDL-cholesterol) and sarcoma.

MATERIALS AND METHODS

Patients

A total 120 individuals were included in our study. Out of them 60 were normal subjects; 30 males and 30 females; having no cardiac or neoplastic disease. The remaining 60 were patients of sarcomas. The patients had no other major illness that affects plasma lipid profile. The patients were not treated with any chemotherapy, radiation or surgery.

Fasting blood samples were collected from CMH, Rawalpindi. The plasma was stored at -20°C until used for plasma lipid profile.

ESTIMATION OF PLASMA LIPID PROFILE

Triglycerides

Triglycerides were determined by enzymatic method (GPO-PAP method), using the commercially available kit manufactured by Human, Germany.

Procedure

Three cuvettes were washed with distilled water and were labelled blank, standard and sample. 20 µl distilled water, 20 µl standard and 20 µl sample, was pipetted in each cuvette respectively. Chromogen reagent, 2 ml was added to each cuvette, contents of all the cuvettes were mixed thoroughly and incubated for 5 minutes at room temperature. The wavelength of spectrophotometer was set at 500 nm. Result command was given to spectrophotometer and after some time results were displayed. The blood triglycerides levels were calculated by applying the following formula.

$$\text{Triglycerides mg/dl} = \frac{\text{Absorbance of sample}}{\text{Absorbance of standard}} \times 200$$

Total Cholesterol

Rapid enzymatic determination of the total cholesterol by CHOD-PAP method, (Allian *el al.*, 1974) was performed by using the commercially available kit manufactured by Human, Germany.

Procedure

Three cuvettes were washed with distilled water and were labelled blank, standard and sample. 20 µl distilled water, 20 µl standard and 20 µl sample was pipetted in each cuvette respectively. Chromogen reagent, 2 ml was added to each cuvette. Contents of all the cuvettes were mixed thoroughly and incubated for 5 minutes at 37°C. The wavelength of spectrophotometer was set at 500 nm. Result command was given to spectrophotometer and after some time results were displayed. The blood cholesterol levels were calculated by applying the following formula.

$$\text{Cholesterol mg/dl} = \frac{\text{Absorbance of sample}}{\text{Absorbance of standard}} \times 200$$

LDL-Cholesterol

LDL-cholesterol was determined by precipitation method. Tests were performed by using the commercially available kit manufactured by Randox, Germany.

Procedure

For sample preparation; 100 µl sample and 1000 µl precipitant were placed in a tube. After through mixing the tube was allowed to stand for 15 minutes at room temperature and then was centrifuged at 1500 rpm for 15 minutes. Supernatant was separated from the sediment and cholesterol was measured by the CHOD-PAP method. The LDL-cholesterol levels were calculated by applying the following formula.

LDL-cholesterol mg/dl = Total cholesterol – Cholesterol in supernatant.

Table 1: Plasma lipid profile of control subjects and patients of sarcomas (Mean ± SD)

	Triglycerides (mg/dl)	Cholesterol (mg/dl)	LDL-cholesterol (mg/dl)	HDL-cholesterol (mg/dl)
Control subjects	149.87±14.03	171.47±19.52	73.30±10.17	50.27±9.26
Sarcoma patients	94.2±29.81	101.27±28.08	50.07±16.52	33.27±12.65

HDL-Cholesterol
HDL-cholesterol was determined by using the commercially available kit manufactured by Randox, Germany.

Procedure
For sample preparation; 200 µl sample and 500 µl precipitant were placed in a tube. After through mixing the tube was allowed to stand for 10 minutes at room temperature and then was centrifuged at 4000 rpm for 10 minute. Supernatant was separated from the sediment and cholesterol was measured by the CHOD-PAP method.

STATISTICAL ANALYSIS

Statistical analyses were performed by using computer program SPSS 11.0 version.

RESULTS AND DISCUSSION

In the present study, plasma level of triglycerides in control males was between 132-178 mg/dl with a mean value of 149.67±13.57. Plasma level of cholesterol in control males was between 135-208 mg/dl with a mean value of 171.40±19.64. Plasma level of LDL-cholesterol in control males was between 54-57 mg/dl with a mean value of 73.47±8.82. Plasma level of HDL-cholesterol in control males was between 35-62 mg/dl with a mean value of 48.00±7.54.

Plasma level of triglycerides in control females was between 129-179 mg/dl with a mean value of 150.07±14.01. Plasma level of Cholesterol in control females was between 138-201 mg/dl with a mean value of 171.33±18.77. Plasma level of LDL-cholesterol in control females was between 52-95 mg/dl with a mean value of 73.13±11.05. Plasma level of HDL-cholesterol in control females was between 42-70 mg/dl with a mean value of 52.20±9.73.

Comparison between mean values of plasma lipid profile of control males and control females showed statistically no significant ($P>0.05$) difference. Thus mean of the two were taken as reference values. The reference value for triglycerides is 149.87±14.03 mg/dl, for cholesterol is 171.47±19.52 mg/dl, for LDL-cholesterol is 73.30±10.17 mg/dl and for HDL-cholesterol is 50.27±9.26 mg/dl.

In sarcoma patients, plasma level of triglycerides was between 47-136 mg/dl with a mean value of 94.20±29.81. Plasma level of cholesterol was between 58-155 mg/dl with a mean value of 101.27±28.08. Plasma level of LDL-cholesterol was between 28-71 mg/dl with a mean value of 50.07±16.52. Plasma level of HDL-cholesterol was between 18-66 mg/dl with a mean value of 33.27±12.65.

Comparison between mean values of plasma lipid profile of control subjects and sarcoma patients is given in table 1. There is highly decrease in plasma levels of triglycerides (37%) and cholesterol (41%); and moderate decrease in LDL-cholesterol (32%) and HDL-cholesterol (33%) in sarcoma patients. Thus all the plasma lipid components (triglycerides, cholesterol, LDL-cholesterol and HDL-cholesterol) of sarcoma patients showed highly significant ($P<0.01$) decrease, when compared with the normal control subjects. Robertson and Ray, (1919) decided that frequency of the incidence of sarcoma is reduced by the administration of cholesterol.

Lipids are major cell membrane components essential for various biological functions including cell growth and division of normal and malignant tissues. Low levels of cholesterol in the proliferating tissues and in blood compartments could be due to the process of carcinogenesis (Patel *et al.*, 2004).

CONCLUSION

This study has shown that plasma lipid levels are decreased in sarcoma patients. As there is a change in plasma lipid profile of Sarcoma patients, the plasma lipid profile may be helpful for diagnosis of the disease.

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