

SIGNIFICANCE OF LIPID PROFILE ESTIMATION IN PATIENT WITH ACUTE MYOCARDIAL INFARCTION

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ABSTRACT: Acute myocardial infarction is one of the important reasons of death and unhealthiness in the world. The present study was undertaken to investigate the changes in serum lipids and lipoproteins in patients with acute myocardial infarction. The levels of lipid profile were significantly changed in the acute myocardial infarction patients. Acute myocardial infarction patients had significantly higher levels of total cholesterol, LDL-cholesterol, TG, Lipoprotein and lower level of HDL-cholesterol, as compared to the control subjects. We found a significant association of lipid profiles with acute myocardial infarction. Reduced serum HDL-cholesterol and increased Serum LDL, Serum TG, Lipoprotein (a), in our study subjects may be the effective reasonable lipid disorders in AMI patients.

Key words: Acute Myocardial Infarction (AMI), Lipid Profile, LDL and HDL cholesterol, Lipoprotein.

INTRODUCTION

Acute Myocardial Infarction (AMI) is one of the most common diseases among the developing countries. MI is defined as prolonged chest pain and is diagnosed as acute myocardial infarction on clinical examination, electrocardiographic changes and laboratory basis (Sathisa TG et al 2011). The mortality rate of MI is approximately 30% and for every 1 in 25 patients who survive the initial hospitalization, dies in the first year after AMI. Indians are four time more prone to AMI as compared to the people of other countries due to a combination of the genetic and lifestyle factors that promote metabolic dysfunction. The risk of cardiovascular disease is predicted by various factors such as age, sex, smoking, hypertension and dyslipidemia (Sathisa TG et al 2011). Elevated serum triglyceride, total cholesterol and LDL cholesterol are well established risk factor, for cardiovascular disease (ADA, 2001, Kritchevsky D et al 1956, Schaefer EJ, 2002, WHO-1990, Yu-Poth S, et al 1999). A low serum HDL cholesterol level is therefore, thought to be an independent cardiovascular risk factor that leads to the development of atherosclerosis and related cardiovascular events (Robert H, 2004). Many large scale studies have shown a high correlation between total plasma cholesterol and LDL levels and the severity of atherosclerosis as judged by the mortality rate from ischemic heart disease (Bibi Kulsoom, Nazrul Hasnain, 2006). This is why; it was considered a consequence of hyperlipidemia, especially hypercholesterolemia leads to AMI. It is well established that a western lifestyle, a high fat, high calorie diet, physical inactivity and tobacco smoking plays a major role in the causes and risk of MI. The biochemical or physiological consequences of this lifestyle include elevated blood pressure, elevated plasma cholesterol, low plasma high density lipoprotein (HDL) cholesterol, elevated plasma TG, diabetes, obesity and thrombogenic factors (Isles CG, Paterson JR, 2000). Several epidemiologic studies have shown that the ratio of total cholesterol to HDL cholesterol and LDL cholesterol to HDL cholesterol also can be used as predictors of MI (Norrapol Wattanasuwan, 2001). The present study was undertaken to investigate the changes in serum lipids and lipoproteins in Patients with acute myocardial infarction.

MATERIALS AND METHODS

The present research was carried out in the Department of Biochemistry, Shridevi Institute of Medical Sciences & Research Hospital, Tumkur, Karnataka, India. The Institutional Ethical Committee clearance was obtained and utmost care was taken during experimental procedure according to the Declaration of Helsinki 1975.

The study was carried out in 25 patients (20 male and 5 female) aged between 40 to 70 years, admitted to our intensive care unit with acute myocardial infarction. The results were compared with healthy controls 25 (16 males and 9 females). Increased total LDH level was taken as criteria for selection of patients. All patients were under the strict supervision of medical professionals during this period. The patients having history of any heart disease, hypertension, thyroid dysfunction, diabetes mellitus were excluded from the study. Screening with complete blood count, ESR, fasting blood glucose was performed and if found abnormal, were excluded from the study. After obtaining a written consent from all the participants, total 5ml blood was withdrawn aseptically from the antecubital vein from each subject in plain bulb after 12 hrs overnight fast. The samples were centrifuged at 3000 rpm for 10 min to separate. The separated serum was collected in polythene tube with cork and stored at -20C. The serum with no sign of hemolysis was used for analysis of all the parameters. Fasting levels of serum total cholesterol, high density Lipoprotein (HDL) cholesterol, low density Lipoprotein (LDL) cholesterol, Triglyceride (TG), Lipoprotein (a) were measured by enzymatic methods using Kits from Erba chem. Limited on spectrophotometer techniques (Model Chemiline CL/310 UV/VIS) in the Biochemistry lab.

The statistical analysis was carried out by using the SPSS (Statistical Package for Social Sciences) software. The Student 't' test was applied for the statistical analysis and the results were expressed in mean \pm SD, p values ($p < 0.001$) were considered as highly significant.

RESULTS

Table 1: Statistical comparison was done between Acute MI patients and control group.

Parameter	Control Group (n= 25)	Acute MI patients (n= 25)
	Mean \pm SD	Mean \pm SD
Serum Cholesterol	175.92 \pm 22.84	201.2 \pm 29.69*
Serum TG	105.2 \pm 27.82	151.32 \pm 36.73*
Serum HDL	41.96 \pm 2.58	40.08 \pm 3.29*
Serum LDL	109.16 \pm 25.54	128.08 \pm 29.09*
Lipoprotein (a)	23.852 \pm 5.97	29.048 \pm 8.96*

The serum of cholesterol, serum triglyceride, Lipoprotein (a) and LDL significant increase ($P < 0.05$) in patients in comparison to controls. While serum HDL recorded significant decreases ($P < 0.01$) in patients in comparison to controls (table 1).

DISCUSSION

In our present study serum triglyceride levels significantly increase in AMI patients when compared with control subjects. There is different mechanism about elevation of TG after MI. it is reported that elevated TG levels may depends on genetic and nutritional basis. TG change level may because inherited abnormality of very low density lipoprotein. It may happen because of increased flowing of fatty acids and impaired elimination of VLDL from the plasma. Our results are supported by other researchers (Bibi Kulsoom, Nazrul Hasnain 2006, Ahmad Shirafkan et al 2012, A Hamsten et al, 1986, Toth PP, 2004).

LDL cholesterol has found to be elevated significantly when compared with controls. LDL carries the most of the cholesterol in the plasma and increasing of LDL depends on increasing of total cholesterol [Bibi Kulsoom et al., 2006, Isles CG et al., 2000 and Ahmad Shirafkan et al., 2012]. Low HDL cholesterol is shown to be associated with higher prevalence and incidence of coronary artery diseases [Bibi Kulsoom et al., 2006, Vetter NJ et al., 1974]. Several studies have supported that the ratio of LDL cholesterol/ HDL cholesterol shows the atherosclerotic injuries of the wall of the vessels (Ahmad Shirafkan et al 2012). We found the significant increase in the ratio of LDL cholesterol level after acute MI. Our study has been supported by latest studies (Ahmad Shirafkan et al 2012, Vetter NJ et al 1974, Sandkamp, et al 1990).

CONCLUSION

M.I is one of the major health problems of our society. It is one of the leading causes of death throughout the world. MI has plenty of factors; one of the factors is dyslipoproteinemias. In our study mean serum levels of total cholesterol, TG, LDL-C, Lipoprotein (a) have been increased significantly, compared to control. Mean serum HDL-C level is decreased significantly, compared to control. Our study shows that altered lipid levels are playing a significant role in the Causation of MI. All the people should undergo lipid profile evaluation regularly to decrease the incidence, morbidity and mortality from the disease.

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