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Research Article

**DIFFERENCE IN SERUM LIPID PROFILE BEFORE AND
AFTER CORONARY ARTERY BYPASS GRAFT SURGERY****Dr. Shariqa Khan¹, Dr Noor Khan², Dr Sirajulhaq³**¹ Yusra Medical College, Shaheed Zulfiqar Ali Bhutto Medical University, Islamabad., ^{2,3}

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Article Received: July 2020**Accepted:** August 2020**Published:** September 2020**Abstract:**

Purpose: To investigate changes in total cholesterol, low density lipoprotein (LDL) cholesterol, high density lipoprotein (HDL) cholesterol, and triglycerides in serum of Pakistani patients before, immediately after and 5 days post CABG.

Place and Duration: In the Medicine Unit-II and Cardiology department of Holy family Hospital, Rawalpindi for one-year duration from March 2019 to March 2020.

Method: Serum samples taken from 31 consecutive Pakistani angina patients who underwent CABG at the medicine and cardiology department were analyzed for total cholesterol, LDL cholesterol, HDL cholesterol and triglycerides using kit methods.

Results: Immediately after CABG, there was a significant decrease in mean serum cholesterol, LDL cholesterol, HDL cholesterol and triglyceride levels. However, 5 days after CABG, there was a significant increase in concentrations of total cholesterol ($P = 0.01$) and LDL cholesterol ($P = 0.001$) in patients with non-diabetic angina ($n = 13$). In the diabetic patient group ($n = 18$), total cholesterol, LDL cholesterol, HDL cholesterol and triglyceride levels returned to preoperative levels within 5 days after CABG. Compared to European patients, Pakistani patients tend to have very low HDL cholesterol levels (24.9 ± 7.1 mg / dl) and high triglyceride levels (185 ± 50 mg / dl). CABG.

Conclusion: Since the mortality risk after CABG increases with low HDL cholesterol level and high triglyceride level, follow-up and treatment of high lipid levels in Pakistani patients after CABG is necessary to prevent further coronary events.

Keywords: CABG,**Corresponding author:****Dr. Shariqa Khan,**Yusra Medical College, Shaheed Zulfiqar Ali Bhutto Medical University,
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INTRODUCTION:

Atherosclerotic changes have been shown to be associated with higher serum lipid levels.^{1,2} Therefore, it is extremely important to determine the lipid status of patients with angina before and after coronary artery bypass (CABG) [1-2]. Few studies have been done to monitor changes in the lipid profile of angina pectoris patients with CABG^{3,4}, but none in the Pakistani population with the highest rates of coronary artery disease³⁻⁴. A recent study in Pakistani patients with acute myocardial infarction (35.7 ± 11.3 mg / dl) mean showed that the serum HDL cholesterol level was well below the normal levels (40 mg / dl) recommended by the National Program. Cholesterol Education. In addition, hypertriglyceridemia was also quite common (30.1%) in these patients. Since serum HDL cholesterol and triglyceride levels predict survival after CABG, monitoring lipid levels is important⁵⁻⁶. patients after CABG to prevent further cardiovascular events. This study was conducted to investigate changes in lipid profile in Pakistani angina patients before, immediately after, and 5 days after CABG. Another aim was to find out whether the changes in lipid profile in these three-time intervals were different in diabetic and non-diabetic angina patients.

PATIENTS AND METHODS:

This study was held in the Medicine Unit-II and Cardiology department of Holy family Hospital, Rawalpindi for one-year duration from March 2019 to March 2020. This study included 31 consecutive patients (25 males and 6 females; mean age 57.7 ± 9.3 years) with Pakistani angina pectoris who underwent were included. Patients had acute coronary syndrome or non-ST segment elevation myocardial infarction before surgery. None of them had a recent major transmural myocardial infarction before surgery. The mean body mass index was 26 ± 4 . 18 of them were diabetic and 23 were hypertensive. The mean duration of angina was 3.2 ± 2.2 days. The mean cardiopulmonary bypass (CPB) time was 121 ± 32 minutes, and the mean time for cross clamp was 74 ± 20 minutes. The mean serum creatinine concentration between them was 1.2 ± 0.49 mg / dl. The study was approved by the Institution's Ethics Review

Committee. The first set of blood samples were collected from a central venous catheter placed during surgery and collected prior to systemic heparinization. After administration of protamine after the operation, blood was taken from the same central catheter. The samples were shipped to the laboratory immediately or after storage at 4 ° C for a short time. Day 5 samples were collected from a peripheral vein prior to discharge from the patient. Serum total cholesterol, low-density lipoprotein (LDL) cholesterol, high-density lipoprotein (HDL) cholesterol, and total triglycerides were analyzed using colorimetric kit methods (RANDOX, UK). Mean values are presented as mean \pm standard deviation (SD). Comparison of two mean values in two different time intervals was performed by paired samples t test. One-way ANOVA was used to compare the mean values of more than two groups. A p value of less than 0.05 was considered significant.

RESULTS:

When the mean concentration values in each group were compared using one-way ANOVA, there was a significant decrease in the concentrations of total cholesterol ($P = 0.0001$), HDL cholesterol ($P = 0.006$), LDL cholesterol immediately after surgery. ($P = 0.0001$) and triglycerides ($P = 0.0003$). This dramatic decrease in the concentration of all lipids mentioned above immediately after surgery is consistent with the results of Figueroa et al., Which reported a similar decrease in total serum cholesterol concentration and attributed this decrease to hemodilution. The mean baseline HDL cholesterol level in our patient population (26.9 ± 8.2 mg / dl) was well below the normal levels (> 40 mg / dl) recommended by the National Cholesterol Education Program shows that they may have contributed. Similarly, low levels of HDL cholesterol have been reported in Pakistani patients with acute myocardial infarction. Indeed, mean baseline HDL cholesterol levels in angina patients undergoing CABG compared to mean baseline levels in patients with AMI (35.7 ± 11.3 mg / dl) were significant. significantly lower ($P = 0.0001$). This again points to the important role low HDL cholesterol plays in the development of coronary artery disease in our population.

Table 1. Serum levels of total cholesterol, HDL cholesterol and LDL cholesterol in diabetic and nondiabetic angina patients before, immediately after, and 5 days post coronary artery bypass grafting (CABG) (Mean±SD).

Patients	No.	Total cholesterol conc. (mg/dl)			*P-value	HDL concentration (mg/dl)			*P-value	LDL concentration (mg/dl)			*P-value
		Before CABG	Immediately after CABG	5 days post CABG		Before CABG	Immediately after CABG	5 days post CABG		Before CABG	Immediately after CABG	5 days post CABG	
		Diabetic	18	152±39		109±29	174±52	0.146		25±5.7	22.1±6.8	23.7±4.6	
Non-diabetic	13	143±33	91±22	178±47	0.01	29.3±10.4	20.1±6.5	26.5±9.5	0.418	76±23	58±17	120±52	0.001

Table 1 and Table 2 show the mean serum levels of total cholesterol, LDL cholesterol, HDL cholesterol, and total triglycerides in patients with diabetic and non-diabetic angina before, immediately after, and 5 days after CABG. Comparison of the aforementioned

mean lipid concentration values before surgery and 5 days after CABG using the paired sample t-test revealed no statistically significant difference between diabetic angina patients; values returned to their pre-operative levels.

Table 2. Serum levels of total triglycerides in diabetic and nondiabetic angina patients before, immediately after and 5 days post coronary artery bypass grafting (CABG) (Mean± SD) .

Patients	No.	Total triglycerides concentration (mg/dl)			P-value
		Before CABG	Immediately after CABG	5 days post CABG	
Diabetic	18	178±85	112±50	198±44	0.289
Nondiabetic	13	160±104	73±40	167±55	0.819

DISCUSSION:

The results reported by Obi et al. And Shaukat et al. Showed that serum values of total cholesterol, HDL serum values of total cholesterol, HDL cholesterol, LDL cholesterol and triglycerides returned to preoperative levels within 4 weeks and 6 weeks [7-8]. Genetic differences between Pakistani and Western populations may be the reason for the rapid increase in the concentration of these lipids in the Pakistani population compared to the Western population. Another noteworthy observation is that the mean baseline levels of serum cholesterol, triglycerides, and LDL cholesterol appear to be higher (though not significant) in the diabetic patient group compared to the non-diabetic group. This is consistent with the poor lipid homeostasis seen in diabetes mellitus. HDL cholesterol was lower in diabetic groups. In the group of patients with non-diabetic angina, there was a significant increase in total cholesterol and LDL cholesterol concentrations on day 5 after CABG (Table 1). This is an indication of the need to intervene

with CABG within a week to lower blood cholesterol, as the Atherosclerosis Study for Low Cholesterol showed that a net reduction in LDL cholesterol of 38% was associated with it. 36% reduction in progression of coronary global score⁹⁻¹⁰. Pakistanis belong to an ethnic group in which coronary heart disease begins at a relatively early age. Also, among people in South Asia, coronary heart disease, coronary heart disease, Europeans.¹⁵ Another case-controlled study conducted in Bangalore, India. The study showed that Indians generally had lower HDL cholesterol and higher triglyceride levels.¹⁶ Our results fit these reports very well, and also our study had significantly lower HDL cholesterol levels (150 mg / dl), especially 5 days after CABG. Recent reports have shown that HDL cholesterol level predicts survival after CABG in men. Similarly, Sprecher et al. Reported that serum triglycerides in the highest quartile after CABG were associated with a 20% increased risk of mortality [11-12]. Therefore, the risk of additional coronary events, if present, can be reduced. effective control of

cholesterol and triglyceride concentrations. The significantly lower HDL cholesterol levels observed in this study after CABG warrant some controversy. In two recent studies in hospital populations in our laboratory, we have shown that low HDL cholesterol levels appear to be among the most important risk factors in the Pakistani population¹³⁻¹⁴. These very low HDL cholesterol levels suggest they are necessary. Measures urgently in patients undergoing CABG to raise HDL cholesterol. These include niacin treatment, smoking cessation, participation in moderate physical activity and statin therapy to reduce future coronary events [15].

CONCLUSION:

The data obtained from this study show that the lipid profile of our patients after CABG rapidly (within 5 days) returned to pre-operative levels. This requires regular monitoring of patients' lipid status and early intervention in terms of preventive and therapeutic measures. Traditionally, HMG CoA reductase inhibitors (statins) are used / restarted six weeks after surgery. This study highlights the need for early replacement of statin therapy after CABG.

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