

# Assessment of Serum Lipid Profile in Patients Undergoing Cholecystectomy

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## Abstract

**Background:** Cholelithiasis is one of the most common gastrointestinal disorders. The present study was conducted to assess lipid profile in patients undergoing cholecystectomy. **Subjects and Methods:** The present study was conducted on 284 patients of both genders. All patients underwent laproscopic cholecystectomy (LC). Serum concentrations of triglyceride (TG), total cholesterol (TC), high-density lipoprotein cholesterol (HDL-C) and low-density lipoprotein cholesterol (LDL-C) were measured before and 30 days after the surgery by using specific kit. **Results:** out of 284 patients, males were 112 and females were 172. Preoperatively total cholesterol increased from 140.2 mg/dl to 172.4 mg/dl, triglyceride decreased from 182.6 mg/dl to 138.5 mg/dl, LDL-C decreased from 76.4 mg/dl to 54.8 mg/dl and HDL-C increased from 42.2 mg/dl to 48.1 mg/dl. The difference was significant ( $P < 0.05$ ) except HDL-C ( $P > 0.05$ ). **Conclusion:** There is alteration of lipid profile in patients undergoing cholecystectomy. Total serum LDL cholesterol and serum triglycerides levels decrease and total serum cholesterol and serum HDL cholesterol increase after cholecystectomy.

**Keywords:** Cholesterol, Triglycerides, Lipids

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## Introduction

Cholelithiasis (gallstone disease) is one of the most common gastrointestinal disorders being prevalent in about 10-15% of adults in the developing countries. The female-to-male ratio was reported between 2 and 3. Numerous conditions contribute to the development of gallstones, with the most important being obesity, hypercaloric diet, diabetes, liver cirrhosis, hemolytic disease, physical inactivity, multiple pregnancies, and long term treatment with sex hormones.<sup>[1]</sup>

It is now widely accepted that the primary event in the pathogenesis of cholesterol gallstones is an altered lipid metabolism because of which there is a relative increase in the cholesterol levels compared to other lipids secreted by the liver into the bile. Cholesterol is water insoluble lipid, and is taken in mixed micelles and vesicles.<sup>[2]</sup> Micelles are aggregates of phospholipids, bile salts, and cholesterol, and vesicles are closed spherical bi-layers of phospholipids with associated cholesterol. There are three stages of gallstone formation, super saturation, nucleation and aggregation.<sup>[3]</sup>

Laparoscopic cholecystectomy (LC) has become the gold standard for surgical treatment of benign gallbladder disease. Cholecystectomy causes redistribution of bile acid pool in the entero-hepatic circulation and increases the frequency of cycling cause reduction in pool size thus exerting effect on lipid profile decreasing total cholesterol and LDL cholesterol levels.<sup>4</sup> The present study was conducted to assess lipid profile in patients undergoing cholecystectomy.

## Subjects and Methods

The present study was conducted in the department of general surgery. It comprised of 284 patients of both genders. The presence of gall stones were confirmed by clinical features and ultrasonography. The study protocol was approved from institutional ethical committee. All patients were informed regarding the study and written consent was obtained.

Patients information such as name, age, gender etc. was recorded. All patients underwent laproscopic cholecystectomy (LC). All were subjected to Blood samples were taken after a 12 hour fasting state. Serum concentrations of triglyceride (TG), total cholesterol (TC), high-density lipoprotein cholesterol (HDL-C) and low-density lipoprotein cholesterol (LDL-C) were measured before and 30 days after the surgery by using specific kit. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

## Results

**Table 1: Distribution of patients**

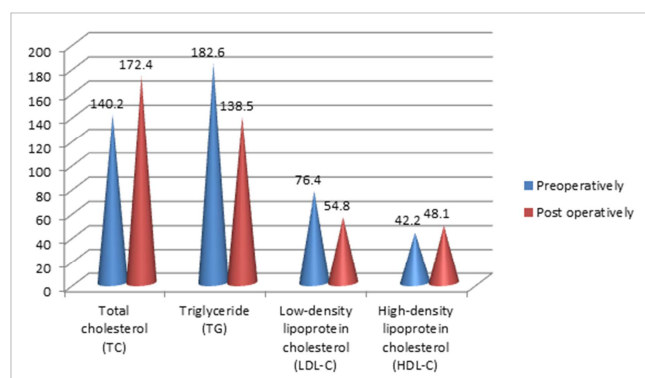
Total- 284		
Gender	Males	Females
Number	112	172

[Table 1] shows that out of 284 patients, males were 112 and females were 172.

**Table 2: Comparison of lipids preoperatively and post operatively**

Parameters	Preoperatively	Post operatively	P value
Total cholesterol (TC)	140.2	172.4	0.02
Triglyceride (TG)	182.6	138.5	0.01
Low-density lipoprotein cholesterol (LDL-C)	76.4	54.8	0.05
High-density lipoprotein cholesterol (HDL-C)	42.2	48.1	0.24

[Table 2] shows that preoperatively total cholesterol increased from 140.2 mg/dl to 172.4 mg/dl, triglyceride decreased from 182.6 mg/dl to 138.5 mg/dl, LDL-C decreased from 76.4 mg/dl to 54.8 mg/dl and HDL-C increased from 42.2 mg/dl to 48.1 mg/dl. The difference was significant (P< 0.05) except HDL-C (P> 0.05).



**Figure 1: Comparison of lipids preoperatively and post operatively.**

## Discussion

Gall stone disease is one of the most common and most expensive conditions to treat of all digestive disorders requiring admission to hospital. Of all gallstones found during cholecystectomy, cholesterol gallstones account for 80-90%. Cholesterol gallstones are primarily made up of cholesterol crystals (70%) which are held together in an organic matrix of glycoproteins, calcium salts, and bile pigments. They could be present either singly or multiply, in various sizes, shapes and surfaces.<sup>[5]</sup> The present study was conducted to assess lipid profile in patients undergoing cholecystectomy.

We included 112 males and 172 females. Portincasa et al,<sup>[6]</sup> studied the effect of cholecystectomy on lipid levels in patients with gallstones. The study was conducted on 50 patients with gallstones and 30 healthy volunteers for comparison of lipid levels. Subsequently, cholecystectomy was conducted on patients with gallstones and pre- and post-operative lipid levels were compared. There was a significant decrease in total cholesterol, and triglycerides levels and increase in high-density lipoprotein levels after 1 month of surgery, while low-density lipoprotein levels and very low-density lipoprotein were not statistically changed.

We observed that preoperatively total cholesterol increased

from 140.2 mg/dl to 172.4 mg/dl, triglyceride decreased from 182.6 mg/dl to 138.5 mg/dl, LDL-C decreased from 76.4 mg/dl to 54.8 mg/dl and HDL-C increased from 42.2 mg/dl to 48.1 mg/dl. Scragg et al,<sup>[7]</sup> found that the total serum cholesterol and LDL levels were significantly decreased one year after the surgery except HDL, were significant differences compared to the pre-surgery values after one year. However, a significant decrease in TG levels was observed during the study.

Olokoba et al,<sup>[8]</sup> conducted a study in which total of 133 patients were divided into two age groups ≤40 and >40 years. In age group ≤40 years, there were 72 cases with no controls, whereas, in >40 years, 61 cases were compared with 67 controls. The serum lipid profile were collected and compared according to the age groups. In age group >40 years serum LDL of gallstone patients were statistically significantly raised (P<0.05) (95% CI -22.077; -850) compared with controls and serum total cholesterol and triglycerides were not statistically significantly high (P >0.05). Serum HDL and VLDL were lower in gallstone patients but not statistically significant (P >0.05) compared to control group.

The etiology of cholesterol gallstones is considered to be multifactorial, with interaction of genetic and environmental factors. The major risk factors for cholesterol gallstone disease are age, female gender and parity.<sup>[9]</sup>

Aulakh et al,<sup>[10]</sup> investigated predisposing factors that lead to the formation of gallstones. In a group of 70 patients (51 with gallstones and 19 without, 20 possible risk factors were studied: percent of ideal body weight, the presence of superoxide dismutase in erythrocytes and in serum, lipid peroxide in serum, total serum cholesterol (Ch), high-density lipoprotein (HDL)-cholesterol (Ch), low-density lipoprotein (LDL)-Ch, very lowdensity lipoprotein (VLDL)-Ch, serum triglyceride (TG), HDL-TG, LDL-TG, VLDL-TG, serum bile acids were higher in patients with gall stones.

## Conclusion

There is alteration of lipid profile in patients undergoing cholecystectomy. Total serum LDL cholesterol and serum triglycerides levels decrease and total serum cholesterol and serum HDL cholesterol increase after cholecystectomy.

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