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Assessment of serum lipid profile in patients undergoing laparoscopic cholecystectomy

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Abstract

Background: Cholecystectomy has long been considered as a safe procedure, while secondary effects have been overlooked where the gallbladder is a 'controller' operating in concert with key pathways governing metabolic homeostasis. If the gallbladder is removed, the bile in the liver will directly enter the upper part of the intestine. Hence; the present study was undertaken to assess serum lipid profile in patients undergoing laparoscopic cholecystectomy.

Materials and Methods: A total of 50 gallstone patients were included. Preoperative blood samples were taken from all the patients under septic conditions two hours before surgery for assessing the preoperative lipid profile. Laparoscopic cholecystectomy was carried out in all the patients under the hands of skilled and experienced surgeons. Postoperative samples were obtained at one week postoperatively and were sent to lobotomy for assessment of postoperative lipid profile. Various serum lipid parameters that were analyzed included: Total cholesterol (TC), High-density lipoprotein cholesterol (HDL-C), and Triglycerides (TGs). All the results were recorded in Microsoft excel sheet and were analyzed by SPSS software.

Results: Mean TC levels preoperatively and postoperatively were 165.5 mg% and 152.8 mg%. Mean HDL-C levels preoperatively and postoperatively were 45.1 mg% and 42.8 mg%. Mean TG levels preoperatively and postoperatively were 190.8 mg% and 210.8 mg%. Significant results were obtained while comparing the mean TC levels and mean TGs levels preoperatively and postoperatively.

Conclusion: Significant alterations in the serum lipid profile occurs in patients undergoing laparoscopic cholecystectomy.

Keywords: Laparoscopic cholecystectomy, Lipid

Introduction

The gallbladder is a small, thin-walled green sac, lies on the underside of the liver in the main liver Scissura at the junction of the right and left lobes of the liver. The Cholechololithiasis is defined as a presence or formation of gallstones in the common bile duct (CBD) [1, 2].

Cholecystectomy has long been considered as a safe procedure, while secondary effects have been overlooked where the gallbladder is a 'controller' operating in concert with key pathways governing metabolic homeostasis [3, 4].

Most of the gallstones patients present with severe abdominal pain requiring investigations and treatment. Many of them need surgical intervention by the time they are symptomatic. If the gallbladder is removed, the bile in the liver will directly enter the upper part of the intestine. As a result, BA circulate faster, thus exposing the enter hepatic system to a greater BA flux. Lipid and BA metabolisms are functionally interrelated [5, 6].

Hence; under the evidence of above mentioned data, the present study was undertaken to assess serum lipid profile in patients undergoing laparoscopic cholecystectomy.

Materials and Methods

The present study was conducted in the department of general surgery of the medical institute and it included assessment of preoperative and postoperative lipid profile of patients undergoing laparoscopic cholecystectomy. Ethical approval was obtained from institutional ethical committee and written consent was obtained from all the patients after explaining in detail the entire research protocol. A total of 50 gallstone patients were included in the present study. Exclusion criteria for the present study included.

- Patients with presence of gallbladder malignancy,
- Diabetic and hypertensive patients,
- Patients with history of presence of any metabolic disorder,
- Patients with any known drug allergy
- Patients with presence of acute abdominal pain

Complete medical history of all the patients was recorded. Physical examination of all the patients was carried out preoperatively. Preoperative blood samples were taken from all the patients under septic conditions two hours before surgery for assessing the preoperative lipid profile. Laparoscopic cholecystectomy was carried out in all the patients under the hands of skilled and experienced surgeons. Postoperative samples were obtained at one week postoperatively and were sent to laboratory for assessment of postoperative lipid profile. Various serum lipid parameters that were analyzed included:

- Total cholesterol (TC),
- High-density lipoprotein cholesterol (HDL-C), and
- Triglycerides (TGs)

All the results were recorded in Microsoft excel sheet and were analyzed by SPSS software. Chi-square test was used for assessment of level of significance. P-Value of less than 0.05 was taken as significant.

Results

In the present study, a total of 50 subjects scheduled to undergo laparoscopic cholecystectomy were analyzed. Mean age of the patients of the present study was 48.5 years. 50 percent of the patients of the present study belonged to the age group of 30 to 50 years. 60 percent of the patients of the present study were females while the remaining were males.

In the present study, mean TC levels preoperatively and postoperatively were 165.5 mg% and 152.8 mg%. Mean HDL-C levels preoperatively and postoperatively were 45.1 mg% and 42.8 mg%. Mean TG levels preoperatively and postoperatively were 190.8 mg% and 210.8 mg%. Significant results were obtained while comparing the mean TC levels and mean TGs levels preoperatively and postoperatively.

Discussion

Gall stones are common in western world with an incidence of 1.4 per 100 person per year [1]. Gall stones are classified into three main types: cholesterol, pigment or mixed stones. Laparoscopic cholecystectomy (LC) has become the gold standard for surgical treatment of benign gallbladder disease. The advantages of this procedure compared to laparotomy include smaller incisions, reduced surgical trauma, less postoperative pain, faster recovery times, a shorter hospital stay, and faster return to normal activities and work. Based on evidence more than 50% of patients with gallstones have some sort of lipid disorder [6-8] hence; the present study was undertaken to assess serum lipid profile in patients undergoing laparoscopic cholecystectomy.

In the present study, mean age of the patients of the present study was 48.5 years. 50 percent of the patients of the present study belonged to the age group of 30 to 50 years. 60 percent of the patients of the present study were females while the remaining were males. Evidence from 30 years ago show that about half of patients with gallstones will have an abnormal lipid profile. This would increase their risk of coronary artery disease and stroke. Recent European studies have shown that hypertriglyceridemia, hypercholesterolemia and low level of high density lipoprotein cholesterol (HDL) a common finding in

patients with cholelithiasis. It is well known that this in turn will be a risk factor for coronary artery disease and stroke [8-10].

In the present study, mean TC levels preoperatively and postoperatively were 165.5 mg% and 152.8 mg%. Mean HDL-C levels preoperatively and postoperatively were 45.1 mg% and 42.8 mg%. Mean TG levels preoperatively and postoperatively were 190.8 mg% and 210.8 mg%. Recent studies have shown that hypertriglyceridemia, hypercholesterolemia, and low level of HDL-C are commonly associated with cholelithiasis. It is a well-known fact that this association can further lead to CAD and stroke [6-9] Roda *et al.*, evaluated that the lowering of cholesterol in post cholecystectomy period due to a more rapid circulation of the bile acid pool in fasting cholecystomised patients leading to improved solubility of cholesterol in bile. Cholecystectomy causes redistribution of bile acid pool in the enterohepatic circulation and increases the frequency of cycling. This exerts negative feedback on bile acid synthesis and cause reduction in pool size and hence exerts effect on lipid profile decreasing total cholesterol and LDL cholesterol levels [10, 11].

In the present study, significant results were obtained while comparing the mean TC levels and mean TGs levels preoperatively and postoperatively. A study by Kronl *et al.* showed that removal of the gallbladder did not influence the absorption of butter fat and olive oil, and that evacuating the gallbladder was not essential for absorbing these types of fats. However, a study by Chavez *et al.* showed cholecystectomy increased high cholesterol levels. Another study by Jawad *et al.* revealed that the removal of the gall bladder caused a marked increase ($P < 0.01$) in plasma TC, TG, VLDL, and LDL levels, with a significant reduction ($P < 0.01$) in HDL levels when compared with normal control rabbits [12-14].

Table 1: Demographic data

Parameter		Number of patients	Percentage of patients
Age group (years)	Less than 30	10	20
	30 to 50	25	50
	More than 50	15	30
Gender	Males	20	40
	Females	30	60

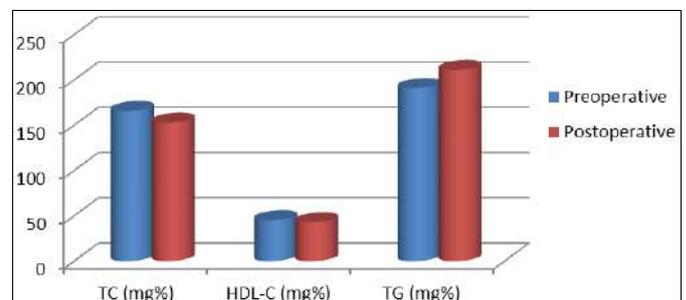


Fig 1: Preoperative and postoperative lipid profile

Table 2: Comparison of preoperative and postoperative lipid profile

Lipid profile	Preoperative	Postoperative	p- value
TC (mg %)	165.5	152.8	0.02*
HDL-C (mg %)	45.1	42.8	0.09
TG (mg %)	190.8	210.8	0.01*

*: Significant

Conclusion

Under the light of above obtained data, it can be concluded that significant alterations in the serum lipid profile occurs in patients undergoing laparoscopic cholecystectomy. These

alterations in lipid profile are likely to have crucial impact on the development of coronary artery diseases in patients with Cholecystectomy.

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