Harsukh Educational Charitable Society
International Journal of Community Health and Medical Research
Journal home page: www.ijchmr.com doi: 10.21276/ijchmr
Official Publication of "*Harsukh Educational Charitable Society*" [Regd.]

ISSN E: 2457-0117 **ISSN P:**2581-5040 **RNI No. -** PUNENG/2017/75049 **Index Copernicus value 2016** = 52.13

Original Article

Assessment Of Cholesterol Levels Among Gall Stone Patients Undergoing Laparoscopic Cholecystectomy: A Comparative Study

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***ABSTRACT*:**
Background: Many studies have shown an association between gallstones and abnormal lipids. Laparoscopic cholecystectomy is a minimally invasive surgical procedure for removal of a diseased gallbladder. Hence; we planned the present study to assess the total cholesterol (TC) levels among gallstone patients undergoing LC. **Materials & methods:** We planned the present study to evaluate total cholesterol levels among patients undergoing laparoscopic cholecystectomy. A total of 50 gallstone patients were included in the present study. Total cholesterol levels were measured in all the patients before laparoscopic cholecystectomy (LC). TC levels in all the patients were recorded on the follow-up time. All the results were recorded on Microsoft excel sheet and analyzed by SPSS software. **Results:** Mean preoperative TC values were found to be 177.2 mg/dL while mean postoperative TC values were found to be 159.4 mg/dL. Significant results were obtained while comparing the mean TC levels in patients undergoing LC. **Conclusion:** Significant decline in total cholesterol levels of gallstone patients do occur after LC procedure.
Key words: Gallstones, Laparoscopic cholecystectomy, Total cholesterol

This article may be cited as: Bajwa S. Assessment of cholesterol levels among gall stone patients undergoing laparoscopic cholecystectomy: A comparative study. HECS Int J Comm Health Med Res 2018;4(2):71-73

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INTRODUCTION

Gallstone disease is a chronic recurrent hepatobiliary disease, which may result from impaired metabolism of cholesterol, bilirubin and bile acid (BA), and is characterized by the formation of the gallstone in hepatic bile duct, common bile duct or gallbladder.[1- 3] Many studies have shown an association between gallstones and abnormal lipids. Laparoscopic cholecystectomy is a minimally invasive surgical procedure for removal of a diseased gallbladder. The etiology of gallbladder disease is associated with a poorly functioning gallbladder and superconcentrated bile.[4, 5] Normally, the gallbladder empties its contents in response to physiologic changes associated with digestion (cholecystokinin, vagal input from antral distension, migrating myoelectric complex). High concentrations of cholesterol within the gallbladder are a known cause for precipitation of cholesterol gallstones.[6- 8] Hence; we planned the present study to assess the total cholesterol (TC) levels among gallstone patients undergoing LC.

MATERIALS & METHODS

We planned the present study to evaluate total cholesterol levels among patients undergoing laparoscopic cholecystectomy. Ethical approval was obtained before the starting of the study. A total of 50 gallstone patients were included in the present study. Total cholesterol levels were measured in all the patients before laparoscopic cholecystectomy (LC). Complete demographic and clinical details of all the subjects were recorded. All the patients underwent LC under the hands of experienced surgeons. TC levels in all the patients were recorded on the follow-up time. All the results were recorded on Microsoft excel sheet and 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, we analyzed a total of 50 gallstone patients who were scheduled to undergo LC. Mean age of the subjects of the present study was 48.2 years. Among these 50 patients, 32 were males while the remaining 18 were females. Mean weight of the subjects of the present study was 64.5 Kg. Mean preoperative TC values were found to be 177.2 mg/dL while mean postoperative TC values were found to be 159.4 mg/dL. Significant results were obtained while comparing the mean TC levels in patients undergoing LC.

Table 1: Demographic details of the patients of the present study

Parameter	Value
No. of patients	50
Mean age (years)	48.2
Males	32
Females	18
Mean weight (Kg)	64.5

Graph 1: Demographic details

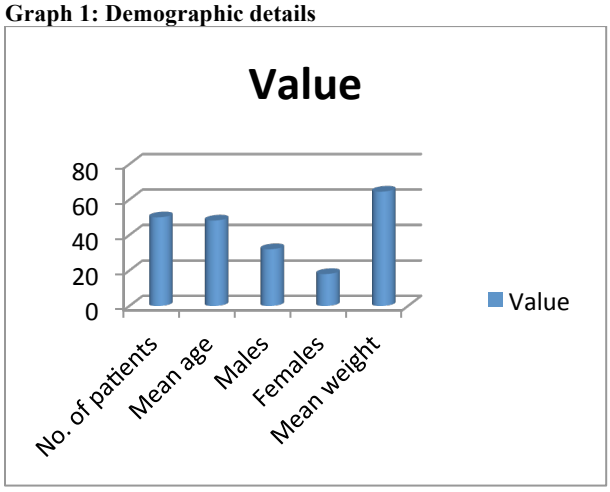
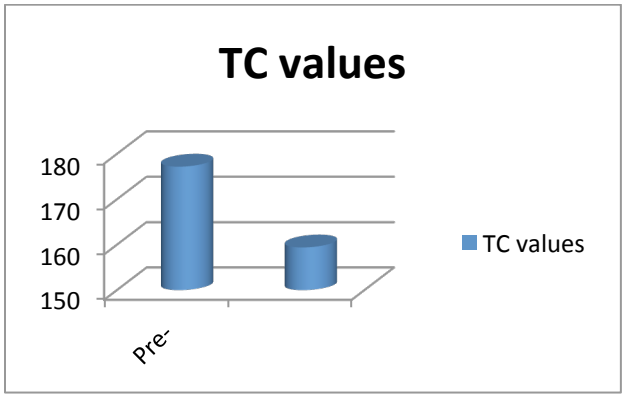


Table 2: Comparison of TC levels preoperative and postoperatively

Parameter	Pre-operative	Postoperative	P- value
TC values	177.2	159.4	0.02

Graph 2: Mean TC values preoperative and postoperatively



DISCUSSION

In the present study, we observed a significant fall in the TC levels in Gallstone patients after cholecystectomy. Strain GW et al assessed the lipid profile changes in the severely obese after laparoscopic sleeve gastrectomy (LSG). Eighty two patients (67 % female, age 46.4 ± 13.9) had presurgery lipid profiles and follow-up (43 at 1 year, 28 at 3 years, and 26 at 5 years). Groups were not different in gender distribution. The pre-surgery mean body mass index (BMI) was 55.7 kg/m(2); 65.9 % of the subjects were super obese. After surgery, percentage of excess BMI loss was 58.1 % year (yr) 1, 61.3 % yr 3, and 39.0 % yr 5. Lipids were within the normal ranges for all parameters at all times; however, at baseline 77 % had at least one abnormality. At 1 year, triglycerides decreased significantly from baseline (adjusted p value (adj-p) = 0.004) and high-density lipoprotein (HDL) increased (adj-p = 0.025). Year 3 HDL was significantly different from baseline, adj-p = 0.0001. Yr 3 cholesterol increased from baseline, (adj-p = 0.027). Negative linear correlations with weight loss were present for low-density lipoprotein (LDL) at yr 3(r = 0.46, p = 0.02) and triglyceride change at year 5 (r = 0.48, p = 0.02). The percentage of patients with dyslipidemia or medicated did not change significantly during these 5 years. For this population electing laparoscopic sleeve gastrectomy (LSG), mean lipid profiles were within normal ranges for all parameters before surgery. However, 77 % showed at least one abnormality presurgery. Weight change correlated with some changes of triglycerides, HDL, and LDL over time, but the impact was limited.[9] Tang WH 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 low-density lipoprotein (VLDL)-Ch, serum triglyceride (TG), HDL-TG, LDL-TG, VLDL-TG, serum bile acids (lithocholic acid, deoxycholic acid, chenodeoxy cholic acid, ursodeoxy-cholic acid, and cholic acid) and serum apolipoproteins (apo A-1, apo B-100, and apo A-1/apo B-100). Levels of apo B-100 and serum insulin in patients with gallstones were strikingly higher, and superoxide dismutase in erythrocytes was significantly lower than in individuals with no gallstones. Apo A-1 and HDL-Ch were also higher and LDL-Ch was lower in the gallstone group, albeit non-significantly so ($P > 0.05$) by t-test. However, Apo A-1, HDL-Ch, and LDL-Ch showed remarkably good discriminatory power in stepwise discriminant analysis of the 20 factors. Bile lipid composition was also measured and the cholesterol saturation index was calculated, but no significant differences were seen between the two groups. The results demonstrate that serum lipid patterns differ to some extent in patients with and without gallstones. Lipid derangement may contribute to the development of gallstone disease.[10]

Gustafsson U et al evaluated the biliary lipid composition in a large series of gallstone patients, with emphasis on the amount of deoxycholic acid and with respect to number of stones, compared to gallstone free subjects. Bile was sampled during operations through puncture of the gallbladder from 145 cholesterol gallstone patients, 23 patients with pigment stones and 87 gallstone free patients undergoing cholecystectomy. Biliary lipid composition, cholesterol saturation, bile acid composition, nucleation time and cholesterol crystals were analysed. The patients with cholesterol gallstones showed higher molar percentage of cholesterol, lower total biliary lipid concentration, higher cholesterol saturation, shorter nucleation time and higher proportion of crystals in bile than the other groups. The nucleation time was significantly shorter in multiple cholesterol gallstone patients, but this was not due to higher cholesterol saturation. Male cholesterol gallstone patients showed higher cholesterol levels, lower total biliary lipid concentration, and higher cholesterol saturation in bile than female

patients. There was no difference in biliary content of deoxycholic acid, but significantly lower content of cholic acid in gallstone patients compared to gallstone free patients. They conclude that deoxycholic acid does not contribute to gallstone formation in cholesterol gallstone patients.[11]

CONCLUSION

Under the light of above mentioned results, the authors conclude that significant decline in total cholesterol levels of gallstone patients do occur after LC procedure. However; further studies are recommended.

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Source of support: Nil **Conflict of interest:** None declared