

Original article:

Analysis of Serum Hepatic Profile of Gall Stone Patients Undergoing Laparoscopic Cholecystectomy: An Institutional Based Study

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ABSTRACT

Background: Gallstones occur when there is an imbalance in the chemical constituents of bile that results in precipitation of one or more of the components. Hence; we assessed serum hepatic profile of gall stone patients undergoing laparoscopic cholecystectomy.

Materials & Methods: The present study included evaluation of preoperative and postoperative serum hepatic profile in patients undergoing LC. A total of 50 patients were included in the present study. Blood samples were obtained from all the patients twenty four hours before the surgery and were sent to the central laboratory for assessment serum hepatic profile. Postoperative samples were obtained at 24 hours and 72 hours postoperatively for assessing the variations occurring in the serum hepatic profile. All the results were compiled in Microsoft excel sheet and were analyzed by SPSS software.

Results: Mean aspartate aminotransferase (AST), Alanine Aminotransferase (ALT) and Total bilirubin pre-operative values were found to be 28.52 IU/L, 29.53 IU/L and 0.80 mg/dL respectively. We observed a significant rise in the mean serum hepatic profile of the patients at 24 hours postoperatively followed by a significant fall at 72 hours postoperatively returning to the preoperative range.

Conclusion: Alterations occurring in the serum hepatic profile reflect the alterations occurring in liver in gall stone patients undergoing cholecystectomy. Hence; special care should be taken while performing such surgical procedures in patients with hepatic insufficiency.

Keywords: Gallstones, Laparoscopic Cholecystectomy, Serum.

INTRODUCTION

Gallstones occur when there is an imbalance in the chemical constituents of bile that results in precipitation of one or more of the components. People with asymptomatic gallstones develop problems related to gallstones at a rate of 1%-4% a year. This means that for most of the population, prophylactic cholecystectomy is unnecessary as the balance of risks and benefits is in favour of "watch and wait." However, a young patient will have a higher risk of developing problems, as there is more time in which to do so, and the balance may therefore favour treatment.¹⁻³

The choices for elective therapy of gallstones have expanded in the last several decades. Although the management of silent gallstones remains controversial, the risk of developing symptoms or complications requiring surgery is quite small (in the range of 1 to 2 percent per year) in most asymptomatic gallstone patients. In symptomatic gallstone patients cholecystectomy remains the treatment of choice and this includes both traditional open and laparoscopic approaches.^{4,5}

Bile acids (ursodeoxycholic acid or chenodeoxycholic acid) are also used in some cases to dissolve radiolucent stones, but these drugs can cause gastrointestinal side effects and there is a high rate of stone recurrence after treatment is discontinued. Lithotripsy is used in some cases in conjunction with ursodeoxycholic acid for patients who have a single symptomatic non-calcified gallstone.⁶ Hence; we planned the study to assess serum hepatic profile of gall stone patients undergoing laparoscopic cholecystectomy (LC).

MATERIALS & METHODS

The present study was carried out in the Department of Surgery, Saveetha Medical College & Hospital, Thandalam, Chennai, Tamil Nadu (India) and it included evaluation of preoperative and postoperative serum hepatic profile in patients undergoing LC.

Inclusion criteria for the present study included:

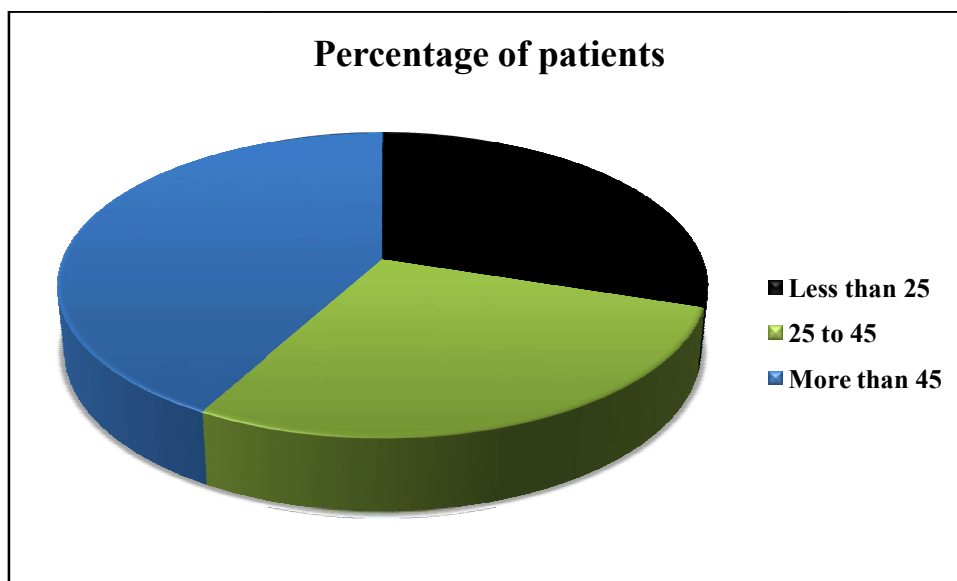
- Patients scheduled to undergo LC,
- Patients with negative history of any other systemic illness,
- Patients with negative history of any form of hepatic dysfunction

After meeting the inclusion criteria, a total of 50 patients were included in the present study. Blood samples were obtained from all the patients twenty four hours before the surgery and were sent to the central laboratory for assessment serum hepatic profile. Postoperative samples were obtained at 24 hours and 72 hours postoperatively for assessing the variations occurring in the serum hepatic profile. All the results were compiled in Microsoft excel sheet and were analyzed by SPSS software. Chi- square test and one way ANOVA were used for assessment of level of significance.

RESULTS

Mean age of the patients of the present study was 48.6 years. 42 percent of the patients of the present study belonged to the age group of more than 42 years. Mean AST, ALT and Total bilirubin pre-operative values were found to be 28.52 IU/L, 29.53 IU/L and 0.80 mg/dL respectively. Mean AST, ALT and Total bilirubin 24 hours postoperatively were found to be 72.69 IU/L, 74.15 IU/L, 1.28 mg/dL respectively. Mean AST, ALT and Total bilirubin 72 hours postoperatively were found to be 29.11 IU/L, 30.48 IU/L and 0.75 mg/dL respectively. We observed a significant rise in the mean serum hepatic profile of the patients at 24 hours postoperatively followed by a significant fall at 72 hours postoperatively returning to the preoperative range.

Graph 1: Age-wise distribution of patients



Graph 2: Gender-wise distribution of patients

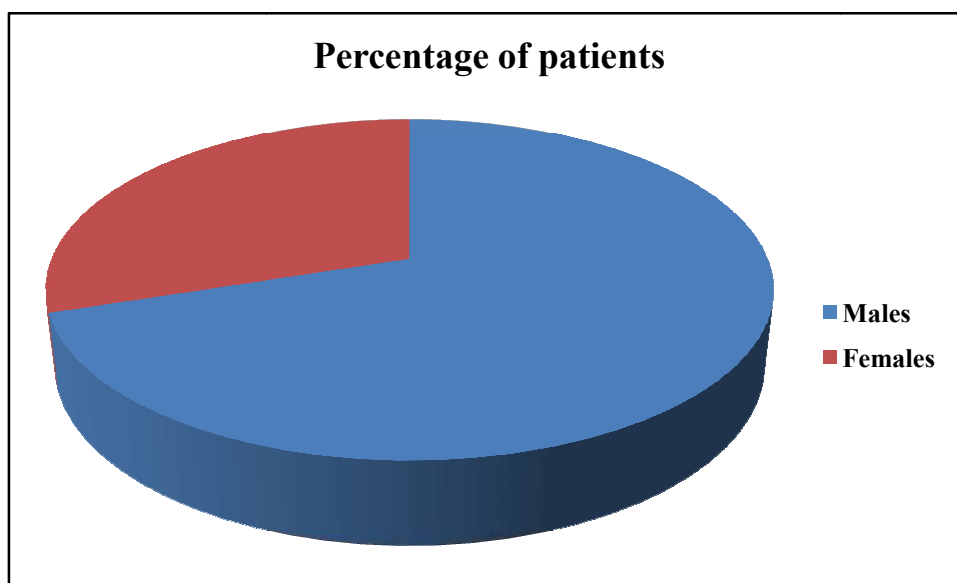


Table 1: Comparison Mean LFT (Liver function test) parameters pre-operatively and postoperatively

Parameter	Preoperative	24 hours postoperative	72 hours postoperative	P- value
AST (IU/L)	28.52	72.69	29.11	0.00 (Significant)
ALT (IU/L)	29.53	74.15	30.48	0.01 (Significant)
Total Bilirubin (mg/dL)	0.80	1.28	0.75	0.00 (Significant)

DISCUSSION

Studies have shown that the vast majority of patients with gallstones will remain asymptomatic throughout life. The reason a subgroup of individuals will ultimately develop symptoms remains unknown; however, once symptoms arise, the recurrence rate is high and risk of progression to gallstone-related complications is significantly increased.⁶⁻⁸ Laparoscopic cholecystectomy (LC) has become the accepted gold standard for operative management of gallstone disease worldwide. It is a minimal access approach for the removal of the gall bladder together with its stones. Because of a markedly shortened hospital stay as well as decreased cost and a mortality rate of less than 1 percent, it is the procedure of choice for most patients referred for elective cholecystectomy, in only 4 to 5 percent of patients are surgeons compelled to convert to open cholecystectomy.^{9,10}

GS are found in 10–20% of the general adult population. In comparison, autopsy studies have shown up to a threefold increase in GS among cirrhotic patients compared with noncirrhotic controls. Cholesterol gallstones are among the most common gastrointestinal disorders in Western societies. Individuals with gallstones may experience various gastrointestinal symptoms and are also at risk of developing acute or chronic cholecystitis. Cholecystectomy is the most frequently recommended conventional treatment for symptomatic gallstones.¹¹

Mean age of the patients of the present study was 48.6 years. 42 percent of the patients of the present study belonged to the age group of more than 42 years. Mean AST, ALT and Total bilirubin pre-operative values were found to be 28.52 IU/L, 29.53 IU/L and 0.80 mg/dL respectively. Mean AST, ALT and Total bilirubin 24 hours postoperatively were found to be 72.69 IU/L, 74.15 IU/L, 1.28 mg/dL respectively. Mean AST, ALT and Total bilirubin 72 hours postoperatively were found to be 29.11 IU/L, 30.48 IU/L and 0.75 mg/dL respectively. Sakorafas G et al measured serum values of alanine aminotransferase, aspartate aminotransferase, alkaline phosphatase, gamma glutamyl transferase, bilirubin, and international normalized ratio (INR) in 72 consecutive patients who underwent laparoscopic cholecystectomy and 36 consecutive patients who underwent open cholecystectomy (OC). During laparoscopic surgery, the intra-abdominal pressure was maintained at 14 mmHg of CO₂. Twenty-four hours after the procedure, ALT and AST increased statistically significantly in the LC group (ALT_{LC24}: 87.1±24.2 U/L P<0.001; AST_{LC24}:82.8±19.1 U/L, p<0.001)--whereas in the OC group, 24 hours after the procedure, the serum value of ALT and AST was above the upper normal limits in only in one patient. A further increase in serum ALT and AST value was observed in the LC group (ALT_{LC72}: 99.3±19.5 U/L, p<0.001; AST_{LC72}: 103.5±21.6 U/L, p<0.001) 72 hours after the operation. The mean value of ALT and AST in the OC group was within normal limits 72 hours after the procedure. Slow return to normality occurred 7-10 days after the procedure in the LC group. Alterations in hepatic function occur after laparoscopic cholecystectomy and appear to be clinically insignificant. CO₂ pneumoperitoneum seems to be the main reason for these changes but other factors may also contribute. They also measured the values of ALP, GGT, INR and bilirubin. No statistically significant increase was noticed in any groups between the preoperative and postoperative values of these enzymes.¹²

We observed a significant rise in the mean serum hepatic profile of the patients at 24 hours postoperatively followed by a significant fall at 72 hours postoperatively returning to the preoperative range. Guven HE et al investigated the alterations in serum levels of alanine aminotransferase (ALT), aspartate aminotransferase (AST), gamma-glutamyl-transferase (GGT), alkaline phosphatase (ALP) and lactate dehydrogenase (LDH) in patients who had undergone laparoscopic cholecystectomy (LC) and compare these changes with those

occurring after open cholecystectomy (OC). Of 267 patients who underwent LC between January 2003 and December 2005, 86 patients without complications were eligible for study. Twenty-six patients who underwent OC during the same interval were also enrolled in the study as a control group. Blood samples were taken preoperatively and 24 hours after operation for biochemical tests. Statistical analyses revealed significant increases in AST, ALT, GGT and LDH levels in the LC group postoperatively. Compared with the OC group, the differences between elevations of enzyme levels were also significant for LC group. They conclude that these enzyme elevations could mostly be attributed to the negative effects of the pneumoperitoneum on the hepatic blood flow.¹³

CONCLUSION

Under the light of above obtained data, the authors conclude that alterations occurring in the serum hepatic profile reflect the alterations occurring in liver in gall stone patients undergoing cholecystectomy. Hence; special care should be taken while performing such surgical procedures in patients with hepatic insufficiency.

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