

# Assessment of Liver Function Tests of the Patients Undergoing Laparoscopic Cholecystectomy: A Clinical Study

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## ABSTRACT

**Background:** Laparoscopic cholecystectomy (LC) has become the gold standard treatment for gall stone disease ever since its introduction in the field of surgery. The sensitivity of liver function tests (LFTs) in detecting obstructions in bile flow has been found to be greater than 90%. Hence; we planned the present study to assess liver function tests of the patients undergoing laparoscopic cholecystectomy.

**Materials & Methods:** A total of 100 patients undergoing laparoscopic cholecystectomy were included in the present study. Preoperative liver function tests of all the patients were assessed. All the patients underwent laparoscopic cholecystectomy under the hands of skilled and experienced surgeons. Postoperative liver function tests of all the patients were assessed at 24 hours. Liver function tests included ALT (alanine transaminase), AST (aspartate transaminase) and total bilirubin. All the results were analyzed by SPSS software version 16.0.

**Results:** At preoperative period, mean AST, ALT and Total bilirubin values were found to be 25.32 IU/L, 26.42 IU/L and 0.79 mg/dL respectively. At 24 hours postoperative, mean AST, ALT and Total bilirubin values were found to be 69.66 IU/L, 71.81 IU/L and 1.45 mg/dL respectively. At 72 hours postoperative, mean AST, ALT and Total bilirubin values were found to be 26.77 IU/L, 28.19 IU/L and 0.82 mg/dL

respectively. Significant results were obtained while comparing the mean liver function tests among patients scheduled to undergo laparoscopic cholecystectomy at different preoperative and postoperative time intervals.

**Conclusion:** Patients undergoing laparoscopic cholecystectomy are associated with transient rise in the levels of liver function tests, which reduce to preoperative limits within 72 hours.


**Key words:** Laparoscopic Cholecystectomy, Liver Function Tests.

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## INTRODUCTION

Laparoscopic cholecystectomy (LC) has become the gold standard treatment for gall stone disease ever since its introduction in the field of surgery.<sup>1</sup> The technique of performing LC has undergone many changes and variations. Adopting laparoscopic cholecystectomy in a treatment of symptomatic cholelithiasis introduced a new spectrum of associated intraoperative and postoperative complications.<sup>2-4</sup> Minor complications (biliary and non-biliary) are usually treated conservatively. Among other techniques for the assessment of biliary injuries, biochemical testing of liver enzymes is a common clinical practice.<sup>5</sup>

The sensitivity of liver function tests (LFTs) in detecting obstructions in bile flow has been found to be greater than 90%. With recent advances in minimal access surgery, laparoscopic cholecystectomy is entering an era where it is considered an outpatient procedure.<sup>6-8</sup> Hence; we planned the present study to

assess liver function tests of the patients undergoing laparoscopic cholecystectomy.

## MATERIALS & METHODS

The present study was conducted in the Department of Surgery, Rajshree Medical Research Institute & Hospital, Bareilly, Uttar Pradesh, India. A total of 100 patients undergoing laparoscopic cholecystectomy were included in the present study. Ethical approval was taken from institutional ethical committee and written consent was obtained from all the patients after explaining in detail the entire research protocol.

## Inclusion Criteria

- Patients undergoing laparoscopic cholecystectomy
- Patients above 18 years of age
- Have symptomatic gallstones

### Exclusion Criteria

- Any patient with pre-operative abnormality in liver enzymes
- Patients with Suspected chronic liver diseases

Complete demographic data of all the patients was obtained. Preoperative liver function tests of all the patients were assessed. All the patients underwent laparoscopic cholecystectomy under the hands of skilled and experienced surgeons.

Postoperative liver function tests of all the patients were assessed at 24 hours. Liver function tests included ALT (alanine transaminase), AST (aspartate transaminase) and total bilirubin. All the results were analyzed by SPSS software version 16.0. Chi-square test and paired t test were used for assessment of level of significance. P- Value of less than 0.05 was taken as significant.

**Table 1: Age-wise and gender-wise distribution of the patients**

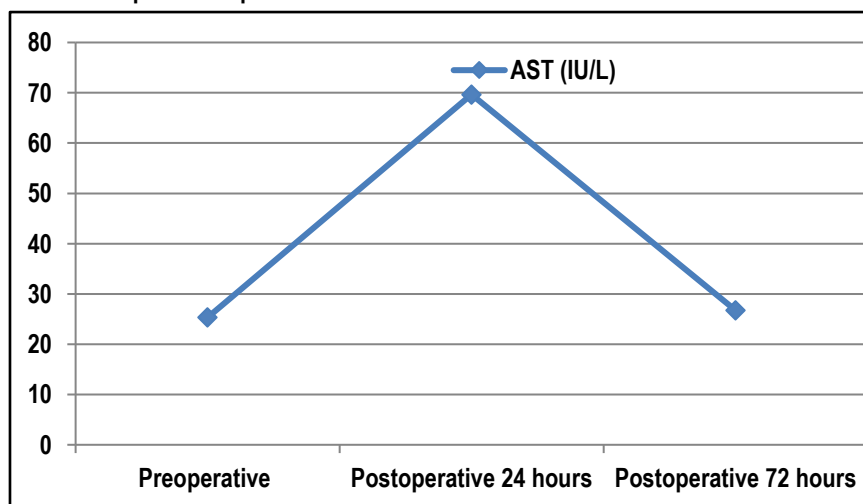
Parameter	Number of patients	
Age group (years)	Less than 30	20
	30 to 50	42
	More than 50 years	38
Gender	Males	30
	Females	70

**Table 2: Comparison of liver function tests preoperatively and postoperatively**

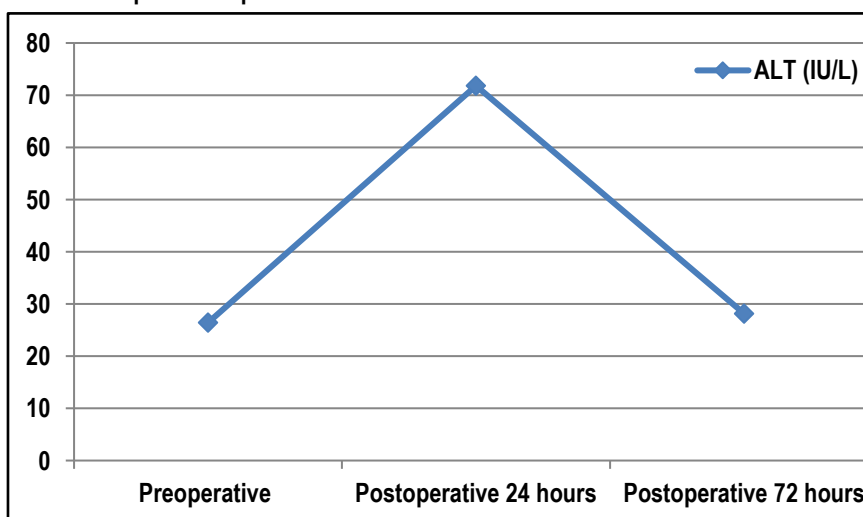
Parameter	Preoperative	Postoperative 24 hours	Postoperative 72 hours	p- value
AST (IU/L)	25.32	69.66	26.77	0.00*
ALT (IU/L)	26.42	71.81	28.19	0.00*
Total Bilirubin (mg/dL)	0.79	1.45	0.82	0.00*

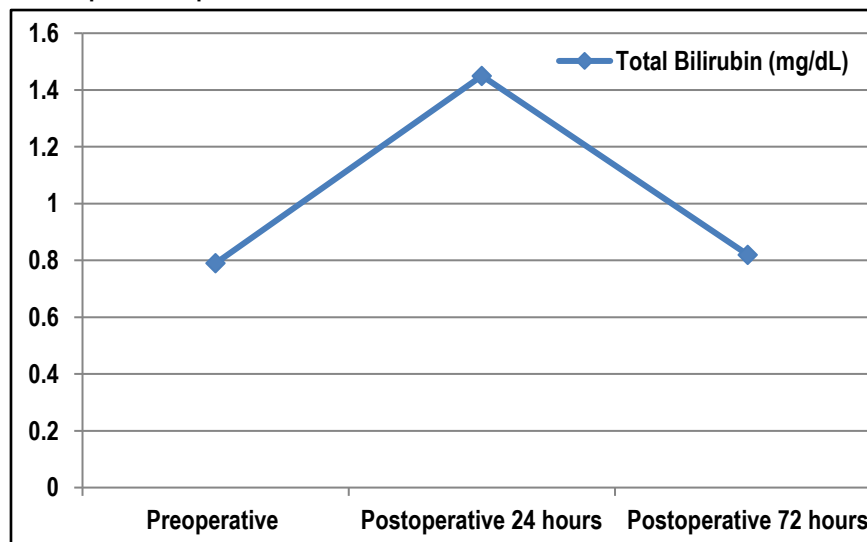
\*: Significant

**Graph 1: Comparison of mean AST levels at different time intervals**



**Graph 2: Comparison of mean ALT levels at different time intervals**



**Graph 3: Comparison of mean total bilirubin levels at different time intervals**

## RESULTS

In the present study, a total of 100 patients scheduled to undergo laparoscopic cholecystectomy were included in the present study. Mean age of the patients of the present study was 48.5 years. There were 30 males and 70 females in the present study. At preoperative period, mean AST, ALT and Total bilirubin values were found to be 25.32 IU/L, 26.42 IU/L and 0.79 mg/dL respectively. At 24 hours postoperative, mean AST, ALT and Total bilirubin values were found to be 69.66 IU/L, 71.81 IU/L and 1.45 mg/dL respectively. At 72 hours postoperative, mean AST, ALT and Total bilirubin values were found to be 26.77 IU/L, 28.19 IU/L and 0.82 mg/dL respectively. Significant results were obtained while comparing the mean liver function tests among patients scheduled to undergo laparoscopic cholecystectomy at different preoperative and postoperative time intervals.

## DISCUSSION

In the present study, mean age of the patients of the present study was 48.5 years. There were 30 males and 70 females in the present study. Kaldor A et al determined if routine postoperative LFTs predict complications. One hundred ninety-nine consecutive patients undergoing laparoscopic cholecystectomy were included in the analysis. Nine (4.5%) patients had postoperative complications: eight with retained common bile duct stones and one with a cystic duct stump leak. All were diagnosed with postoperative endoscopic retrograde cholangiopancreatography. Only four of the nine patients had hyperbilirubinemia. Overall, 39 patients had postcholecystectomy hyperbilirubinemia, with four (10%) patients having complications (three retained stones and one had a bile leak). For the entire study population, there was no difference between pre- and postoperative total bilirubin and aspartate aminotransferase levels. There was a statistically significant difference in pre- and postoperative alanine aminotransferase and alkaline phosphatase. Postoperative elevations in liver function tests are frequently seen after laparoscopic cholecystectomy.<sup>8</sup>

In the present study, at preoperative period, mean AST, ALT and Total bilirubin values were found to be 25.32 IU/L, 26.42 IU/L and 0.79 mg/dL respectively. At 24 hours postoperative, mean AST,

ALT and Total bilirubin values were found to be 69.66 IU/L, 71.81 IU/L and 1.45 mg/dL respectively. At 72 hours postoperative, mean AST, ALT and Total bilirubin values were found to be 26.77 IU/L, 28.19 IU/L and 0.82 mg/dL respectively. Stain SC et al analyzed the value of LFTs to predict common bile duct (CBD) stones in patients treated by LC. CBD stones were identified in 41 of 660 patients (6.2%) treated by LC during the study period (January 1991 to May 1993). CBD stones were identified by preoperative endoscopic retrograde cholangiography (ERC) in 19 of 33 patients (57.6%); by operative cholangiography in 18 of 289 patients (6.2%), and by postoperative ERC in 4 patients. In patients with CBD stones, there was a significant difference in alkaline phosphatase, total bilirubin, SGPT, and SGOT ( $P < 0.001$ ). The positive predictive value (PPV) of a value  $>$  normal at admission was 5%-19%; and immediately before operation was 9%-36%. The PPV of a value  $> 2X$  normal was 30%-47%. Alkaline phosphatase and total bilirubin were independent predictors of CBD stones. If both were greater than twice normal, there was a 55 per cent incidence of CBD stones. Their analysis suggests that patients with greater than twice normal liver function tests have a sufficient incidence of CBD stones to warrant ERC.<sup>9</sup>

In the present study, significant results were obtained while comparing the mean liver function tests among patients scheduled to undergo laparoscopic cholecystectomy at different preoperative and postoperative time intervals. Halevy A et al assessed the elevated liver enzymes and bilirubin levels in patients undergoing laparoscopic cholecystectomy in the absence of bile duct injury. Sixty-seven patients with normal results of preoperative liver function test were entered into the study. Blood was collected 24 hours after laparoscopic cholecystectomy, and AST, ALT, ALP, and bilirubin levels were measured. A mean 1.8-fold increase in AST occurred in 73% of patients; 82% showed a 2.2-fold increase in ALT. A statistically nonsignificant increase was noted in 53% of patients (ALP remained within normal limits), and in 14% of patients bilirubin levels were increased (they were primarily of the unconjugated type). In many patients a significant increase in AST and ALT levels occurred after laparoscopic cholecystectomy, but they returned to normal values within 72 hours.<sup>10</sup>

## CONCLUSION

Under the light of above obtained results, the authors concluded that patients undergoing laparoscopic cholecystectomy are associated with transient rise in the levels of liver function tests, which reduce to preoperative limits within 72 hours. However; further studies are recommended.

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