

ORIGINAL RESEARCH

Assessment of liver function tests in patients undergoing laparoscopic cholecystectomy

Dr. Gaurav Kataria¹, Dr Preeti Juneja²

¹Assistant Professor, MMU Medical College & hospital, Solan, Himachal Pradesh

²Assistant Professor, Lady Hardinge Medical College, New Delhi

ABSTRACT:

Background: Diseases of the gallbladder commonly manifest as gallstones and gallbladder cancer. The prevalence of gallbladder stones varies widely in different communities in India. Hence; the present study was undertaken for assessing liver function tests in patients undergoing laparoscopic cholecystectomy. **Materials & methods:** 50 patients undergoing laparoscopic cholecystectomy were enrolled in the present study. A detailed work up of all the patients enrolled in the study i.e. detailed history, a thorough Clinical Examination was performed. After that all patients got their pre-anaesthetic check-up and underwent laparoscopic cholecystectomy under constant intraperitoneal pressure (12mm Hg) subsequently. In the liver function tests, following parameters were specifically studied- ALT (alanine transaminase), AST (aspartate transaminase) and Bilirubin (total). The liver function tests were repeated twice, i.e 24 hours and 72 hours after surgery to monitor liver function. All the results were analysed by SPSS software. **Results:** Mean AST levels during preoperative, 24 hours postoperative and 72 hours postoperative was found to be 28.5 IU/L, 76.12 IU/L and 29.71 IU/L respectively. Mean ALT levels during preoperative, 24 hours postoperative and 72 hours postoperative was found to be 29.42 IU/L, 76.41 IU/L and 30.25 IU/L respectively. Mean total bilirubin levels during preoperative, 24 hours postoperative and 72 hours postoperative was found to be 0.81 IU/L, 1.45 IU/L and 0.79 IU/L respectively. In the present study, while analysing statistically, we observed a significant transient rise in LFT profile immediate postoperatively followed by returning to normal range at 72 hours. **Conclusion:** There is transient rise in liver function tests postoperatively in patients undergoing laparoscopic cholecystectomy.

Key words: Laparoscopic cholecystectomy, Liver function tests

Received: 13 July, 2020

Accepted: 19 July, 2020

Corresponding author: Dr Preeti Juneja, Assistant Professor, Lady Hardinge Medical College, New Delhi

This article may be cited as: Kataria G, Juneja P. Assessment of liver function tests in patients undergoing laparoscopic cholecystectomy. Int J Res Health Allied Sci 2020; 6(4): 107- 109.

INTRODUCTION

Diseases of the gallbladder commonly manifest as gallstones and gallbladder cancer. The prevalence of gallbladder stones varies widely in different communities in India. Laparoscopic surgery is always considered as better than classical open one due to various advantages. Because of small incisions pain and complications like haemorrhage are reduced and time required for recovery is squatted.¹⁻³

The key feature in laparoscopic surgery is the custom of a laparoscope, a long optic cable system which allows easy accessibility of site. Laparoscopic cholecystectomy needs numerous miniature incisions in the abdomen through which operating ports, surgical instruments and a video camera are positioned into the abdominal cavity.⁴

It has been found that this procedure is usually associated with impairment of hepatic function, at least temporarily,

in previously healthy patients. Although it appears that these changes are of no clinical importance to date, the cause or causes behind these disturbances are still speculative and the size of the problem has not been fully addressed.⁵

The sensitivity of Liver Function Tests [LFTs] in detecting obstructions in bile flow has been found to be greater than 90%. AST (aspartate aminotransferase) and ALT (alanine aminotransferase) are generally considered a measure of hepatocellular function. ALP (alkaline phosphatase) levels are increased during obstruction of the biliary duct system; bilirubin levels can increase due to hemolysis or obstruction of the flow of bile. Very high levels of serum transaminases can also be suggestive of common bile duct (CBD) stones.^{6- 8} Hence; the present study was undertaken for assessing liver function tests in patients undergoing laparoscopic cholecystectomy.

MATERIALS & METHODS

The present study was conducted with the aim of assessing liver function tests in patients undergoing laparoscopic cholecystectomy. 50 patients undergoing laparoscopic cholecystectomy were enrolled in the present study.

Inclusion Criteria

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

A detailed work up of all the patients enrolled in the study i.e. detailed history, a thorough Clinical Examination was performed. After that all patients got their pre-anaesthetic check-up and underwent laparoscopic cholecystectomy under constant intraperitoneal pressure (12mm Hg) subsequently.

In the liver function tests, following parameters were specifically studied-

- ALT (alanine transaminase)
- AST (aspartate transaminase)
- Bilirubin (total)

The liver function tests were repeated twice, i.e 24 hours and 72 hours after surgery to monitor liver function. On discharge all patients were asked to follow up in surgery OPD on 10th postoperative day. All the results were analysed by SPSS software. 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.

RESULTS

A total of 50 patients were analysed. Mean age of the patients was 46.5 years. There were 39 males and 11 females. Majority of the patients belonged to the age group of more than 40 years. Mean AST levels during preoperative, 24 hours postoperative and 72 hours postoperative was found to be 28.5 IU/L, 76.12 IU/L and 29.71 IU/L respectively. Mean ALT levels during preoperative, 24 hours postoperative and 72 hours postoperative was found to be 29.42 IU/L, 76.41 IU/L and 30.25 IU/L respectively. Mean total bilirubin levels during preoperative, 24 hours postoperative and 72 hours postoperative was found to be 0.81 IU/L, 1.45 IU/L and 0.79 IU/L respectively. In the present study, while analysing statistically, we observed a significant transient rise in LFT profile immediate postoperatively followed by returning to normal range at 72 hours.

Table 1: Mean and SD of LFT parameters pre-operatively

Parameter	Preoperative	24 hours post-operative	72 hours post-operative	p-value
AST (IU/L)	28.35	76.12	29.71	0.00*
ALT (IU/L)	29.42	76.41	30.25	0.01*
Total Bilirubin (IU/L)	0.81	1.45	0.79	0.00*

*: Significant

DISCUSSION

For any major change or progress to take place, many factors must fall into place. In the case of laparoscopy, dramatic technical innovations were required. Additionally, there is a season for any change, requiring a favorable and supportive philosophical environment. Authoritative institutions must be convinced of the safety and efficacy of the changes relative to the comfortable status quo. Momentum always favors inertia. Fears must be overcome: fear of making mistakes, fear of failure, fear of established procedures becoming obsolete, and fear of established authorities losing control. Successful change requires timing and a force more powerful than the status quo. The strongest force for sustainable change is a worthy goal. Disturbances in liver enzymes after laparoscopic cholecystectomy have been reported in the past literature.⁶⁻⁹ Hence; the present study was undertaken for assessing liver function tests in patients undergoing laparoscopic cholecystectomy.

In the present study, a total of 50 patients were analysed. Mean age of the patients was 46.5 years. There were 39 males and 11 females. Majority of the patients belonged to the age group of more than 40 years. Mean AST levels during preoperative, 24 hours postoperative and 72 hours postoperative was found to be 28.5 IU/L, 76.12 IU/L and 29.71 IU/L respectively. Mean ALT levels during preoperative, 24 hours postoperative and 72 hours postoperative was found to be 29.42 IU/L, 76.41 IU/L and 30.25 IU/L respectively. Mean total bilirubin levels during preoperative, 24 hours postoperative and 72 hours postoperative was found to be 0.81 IU/L, 1.45 IU/L and 0.79 IU/L respectively. Ibrahim AMS et al investigated the effect of laparoscopic surgeries on liver function tests and the possible mechanisms behind such effect, in their Hospital by statistical analysis. The authors concluded that there was transient elevation of hepatic enzymes after laparoscopic surgery. The major causative factor would be the carbondioxide pneumoperitoneum. In majority of the laparoscopic surgery patients, the transient elevation of serum liver enzymes showed no apparent clinical manifestations.¹¹ Berg MVD et al evaluated the value of preoperative liver function tests (LFTs) in patients with uncomplicated gallstone disease and scheduled for laparoscopic cholecystectomy. A total of 697 patients were included. There were 629 (90.2%) patients with (group I) and 68 (9.8%) patients without (group II) preoperative LFTs. Group I patients were divided into four groups: 360 patients with normal LFTs (I-A1), 269 patients with at least one LFT > normal value (I-A2), 531 patients with all LFTs <2× normal (I-B1), and 98 patients with at least one LFT >2× normal (I-B2). Preoperative LFTs do not influence the occurrence of postoperative complications.¹²

In the present study, while analysing statistically, we observed a significant transient rise in LFT profile immediate postoperatively followed by returning to normal range at 72 hours. Rao PR et al collected blood samples were collected from 60 inpatients, undergoing various laparoscopic procedures, preoperatively once and

post operatively on days 1 and 3. They were tested for liver function by assessing levels of serum bilirubin, serum alanine amino transferase (ALT), serum aspartateaminotransferase (AST) and serum alkaline phosphatase (ALP). The level of serum AST, ALT, bilirubin and alkaline phosphatase increased significantly during the immediate post-operative period. Doubling of pre-op values of AST was seen in 28.3% and of ALT was seen in 25%. By the 3rd post-operative day, levels of AST, ALT, bilirubin and alkaline phosphatase returned to near pre-operative values.¹³ Mohindra M et al evaluated effect of carbon dioxide pneumoperitoneum on liver functions following LC. A total of 200 subjects were included in the present study. All the patients underwent LC for the treatment of gall stones. In all the patients, pre-operative assessment of LFT was done which included evaluation of AST (aspartate aminotransferase), ALT (alanine aminotransferase), total bilirubin (TB), direct bilirubin (DB) and alkaline phosphatase (ALP). All the values were evaluated post-operatively also after twenty four hours. LC was carried out in all these patients using standard procedure. Comparative evaluation of all the LFT parameters was done pre-operative and post-operatively. Significant results were obtained while comparing the preoperative and postoperative mean AST, ALT, TB and DB levels in patients undergoing LC. However, while comparing the mean AP values, non-significant results were obtained. The overall increase in the mean AST, ALT, TB and DB values was seen in 95 %, 93 %, 73 % and 70% subjects respectively. Alteration in hepatic profile does occur in patients undergoing LC.¹⁴

CONCLUSION

There is transient rise in liver function tests postoperatively in patients undergoing laparoscopic cholecystectomy.

REFERENCE

1. Subhash, CS & Janmejai, PS 2014, ' Comparison of liver function test in patients undergoing cholecystectomy (Open And Laparoscopic): A retrospective study', Indian Journal of Basic and Applied Medical Research, Vol. 4, No. 1, pp. 511-517
2. Abdulkarim, O & Kamal, E 2007, 'Effect of carbon dioxide pneumoperitoneum on liver function following laparoscopic cholecystectomy', Journal of Laparoendoscopic & Advanced Surgical Techniques, Vol. 17, No. 4, pp. 419-424
3. Sakorafas GI, Anagnostopoulos G, Stafyla V, Koletis T, Kotsifopoulos N, Tsiakos S, Kassaras G. Elevation of serum liver enzymes after laparoscopic cholecystectomy. N Z Med J. 2005 Feb 25;118(1210):U1317.
4. Ahmad NZ1. Routine testing of liver function before and after elective laparoscopic cholecystectomy: is it necessary? JSLS. 2011 Jan-Mar;15(1):65-9. doi: 10.4293/108680811X13022985131291.
5. Halevy AI, Gold-Deutch R, Negri M, Lin G, Shlamkovich N, Evans S, Cotariu D, Scapa E, Bahar M, Sackier JM. Are elevated liver enzymes and bilirubin levels significant after laparoscopic cholecystectomy in the absence of bile duct injury? Ann Surg. 1994 Apr;219(4):362-4.
6. Tan M, Xu F-F, Peng J-S, Li DM, Chen LH, Lv BJ. et al. Changes in the level of serum liver enzymes after laparoscopic surgery. World Journal of Gastroenterology : WJG. 2003;9(2):364-367.
7. Hagra MMAE. Alterations in liver function tests following laparoscopic Cholecystectomy. Pak J Surg 2013; 29(4):245-247.
8. Rana ML, Bansal AS, Singh NJ, Swain N. Study in change in Liver Enzymes after Laproscopic Cholecystectomy: A retrospective study. Journal of Evolution of Medical and Dental Sciences. 2014;3(73): 15411-15416,
9. Neri V, Ambrosi A, Fersini A, Tartaglia N, Cianci P, Lapolla F et al. Laparoscopic cholecystectomy: evaluation of liver function tests. Ann. Ital. Chir., 2014 85: 431-437.
10. Singal R, Singal RP, Sandhu K, Singh B, Bhatia G, Khatri A et al. Evaluation and comparison of postoperative levels of serum bilirubin, serum transaminases and alkaline phosphatase in laparoscopic cholecystectomy versus open cholecystectomy. Journal of Gastrointestinal Oncology. 2015;6(5):479-486.
11. Ibrahim AMS, Boppana VB, Palanu M. Evaluation of the Effects of Laparoscopic Surgeries on Hepatic Enzymes.IOSR Journal of Dental and Medical Sciences. 2017; 16(8): 22-28.
12. Berg MVD, Couwelaar GMV, Raaff CALD, Lagarde SM et al. Are routine preoperative liver function tests in patients with uncomplicated symptomatic gallstone disease necessary? Acta Chirurgica Belgica. 2017; 117(5):290- 294.
13. Rao PR, Kongara S, Snigdha Y, Kalyan KASSN. Study of Alterations in Liver Function Tests Following Laparoscopic Surgery. IOSR Journal of Dental and Medical Sciences (IOSR-JDMS). 2017; 16 (2): 48-54.
14. Mohindra M, Singh MP, Arora D. Incidence of Alteration in Liver Functional Tests in Patients Undergoing Laparoscopic Cholecystectomy. J Adv Med Dent Scie Res 2017;5(10):62-64.