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ORIGINAL ARTICLE

Evaluation of Effect of Laparoscopic Cholecystectomy on Hepatic Profile of Gallstone Patients: A Clinical Study

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ABSTRACT:

Background: Gallstones, or choleliths, are solid masses formed from bile precipitates. 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. Hence; we planned the present study to assess the effect of laparoscopic cholecystectomy in the hepatic profile of gallstone patients.**Materials & methods:** We planned the present study to assess of effect of LC on the hepatic profile of gall stone patients. A total of 40 patients were included in the present study. All the patients underwent LC under general anaesthesia. Assessment of liver functions was done after 24 hours and on 10th day of surgery. Following parameters were studied: ALT (alanine transaminase), AST (aspartate transaminase) and ALP (alkaline phosphatase). All the results were analyzed by SPSS software version 16.0. **Results:** We observed significant rise in the mean hepatic profile of the patients 24 hours after surgery followed by returning the values to within preoperative range tenth day after surgery.**Conclusion:**hepatic profile of the gallstone patients is transiently affected by LC procedure.

Key words: Gallstones, Hepatic, Laparoscopic cholecystectomy

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INTRODUCTION

Diseases of the gallbladder commonly manifest as gallstones and gallbladder cancer. Gallstones, or choleliths, are solid masses formed from bile precipitates. These "stones" may occur in the gallbladder or the biliary tract (ducts leading from the liver to the small intestine). There are two types of gallstones: cholesterol and pigment stones. Both types have their own unique epidemiology and risk factors.[1, 2] Cholesterol stones are yellow-green and are primarily made of hardened cholesterol. Cholesterol stones, predominantly found in women and obese people, are associated with bile supersaturated with cholesterol.[3]

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.[4]

Most of the studies have supported the CO_2pneumoperitoneum as the most satisfying explanation for changes in liver function following laparoscopic cholecystectomy but these changes have not been accompanied by any adverse clinical outcome.[5, 6]

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.[7-9] Hence; we planned the present study to assess the effect of laparoscopic cholecystectomy (LC) in the hepatic profile of gallstone patients.

MATERIALS & METHODS

We planned the present study in the department of general surgery of the medical institution and included assessment of effect of LC on the hepatic profile of gall stone patients. A total of 40 patients 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
- Patients with Common bile duct pathology
- Patients with Intra – Operative Complication – CBD (common bile duct) injury, jaundice, cholangitis
- Patients on hepatotoxic drugs

We obtained detailed clinical and demographic details of all the patients.A thorough Clinical Examination was

performed, followed by routine investigations including CBC (complete blood count), FBS (fasting blood sugar)/RBS (random blood sugar), PTI (prothrombin time index)/INR (international normalized ratio), RFTs (renal function tests), LFTs (liver function tests), Urine Routine, Serum Electrolytes, Viral Markers, Chest X Ray, Ultrasound Abdomen. All the patients underwent LC under general anaesthesia. Assessment of liver functions was done after 24 hours and on 10^{th} day of surgery. Following parameters were studied: ALT (alanine transaminase), AST (aspartate transaminase) and ALP (alkaline phosphatase). 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.

RESULTS

Mean AST, ALT and alkaline phosphatase pre-operative values were found to be 27.5 IU/L, 28.1 IU/L, and 78.6 IU/L respectively. Mean AST, ALT and alkaline phosphatase post-operative values at 24 hours were found to be 69.4 IU/L, 71.4 IU/L and 75.1 IU/L respectively. We observed significant rise in the mean hepatic profile of the patients 24 hours after surgery followed by returning the values to within preoperative range tenth day after surgery.

Table 1: Distribution of subjects according to gender

Gender	Frequency	Percent
Male	12	24
Female	38	76
Total	50	100.0

Table 2: Mean and SD of LFT parameters pre-operatively

Parameter	Pre-operative Mean	Post-operative 24 hours	Post-operative 10^{th} day	P-value
AST	27.5	69.4	27.7	0.02*
ALT	28.1	71.4	29.4	
Alkaline Phosphatase	78.6	75.1	77.9	

*: Significant

DISCUSSION

In the present study, we observed a transient alteration in the hepatic profile of the patients undergoing LC.Ibrahim AMS et al investigated the effect of laparoscopic surgeries on liver function tests and the possible mechanisms behind such effect, in our Hospital by statistical analysis. A prospective study was conducted in 60 patients who were undergoing various types of laparoscopic procedure in our Hospital. Blood sampling were collected both preoperatively and post operatively on day 1 and day 7 for liver function tests by comparing the level of serum bilirubin, serum alanine amino transferase (ALT), serum aspartate amino transferase (AST) and serum alkaline phosphatase (ALP). The time duration ofC02 insufflation was also measured. The level of serum bilirubin, serum aspartate amino transferase, serum alanine amino transferase and alkaline phosphatase increased significantly during the first 24 hours post operatively. Doubling of pre-op values of AST was seen in 46%, ALT in 32% and S. Bilirubin in 35% patients. These values returned to near pre-operative value by the 7th day post operation. In this study, 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.[10]

Berg MVD et al evaluate 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.[11] 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 aspartate aminotransferase (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. Therefore, transient elevation of hepatic enzymes occurred after all types of laparoscopic procedures. This transient rise showed no apparent clinical implication in most patients.[12] 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.[13]

CONCLUSION

From the above results, the authors conclude that hepatic profile of the gallstone patients is transiently affected by LC procedure. However; we advocate future studies.

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