

Analysis of Alterations in Serum Bilirubin Levels Pre and Post Laparoscopic Cholecystectomy at a Tertiary Care Hospital

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ABSTRACT

Background: The present study was conducted for assessing alterations in serum bilirubin levels pre and post Laparoscopic cholecystectomy (LC).

Materials & Methods: A total of 100 patients scheduled to undergo LC were enrolled. Complete demographic details of all the patients were obtained. Blood samples were obtained, and serum bilirubin levels were assessed preoperatively at baseline. At postoperative 24 hours and 72 hours, serum bilirubin profile was re-evaluated. Comparison of the alterations in the serum bilirubin levels was made. All the results were recorded and analyzed by SPSS software.

Results: During preoperative period, postoperative 24 hours and postoperative 72 hours, mean total serum bilirubin levels were found to be 0.82 mg/dL, 1.42 mg/dL and 0.83 mg/dL respectively; on comparing, the results were found to be statistically significant. During preoperative period, postoperative 24 hours and postoperative 72 hours, mean serum direct bilirubin levels were found to be 0.22 mg/dL, 0.45 mg/dL and 0.26 mg/dL respectively; on comparing, the results were found to be statistically significant.

Conclusion: Serum bilirubin levels are significantly altered among patients undergoing Laparoscopic cholecystectomy.

KEYWORDS: Laparoscopic Cholecystectomy, Bilirubin.

INTRODUCTION

Laparoscopic cholecystectomy was first introduced by Muhe in 1986 and has now evolved to the point where it has replaced the open technique in many medical centers around the world. Today, laparoscopic cholecystectomy, rather than the open technique, is considered as the treatment of choice for gallstone disease.¹⁻³ Perceived advantages of laparoscopic cholecystectomy, compared with the open technique, include earlier return of bowel motility, less post-operative pain, better cosmetic result, and shorter hospital stay resulting in equal or lower hospital costs, as documented by various randomized control trials.⁴⁻⁶

Among other techniques for the assessment of biliary injuries, biochemical testing of liver enzymes is a common clinical practice. The sensitivity of LFTs in detecting obstructions in bile flow has been found to be greater than 90%. Any increase in their values is always a matter of concern for the clinician and warrants further investigation to determine the underlying pathology. AST and ALT are generally considered a measure of hepatocellular function. ALP 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; the present study was conducted for assessing alterations in serum bilirubin levels pre and post Laparoscopic cholecystectomy (LC).

MATERIALS & METHODS

The present study was conducted in the Department of Surgery, University College of Medical Sciences, and Guru Teg Bahadur Hospital, Delhi (India) for assessing alterations in serum bilirubin levels pre and post Laparoscopic cholecystectomy (LC). A total of 100 patients scheduled to undergo LC were enrolled. Complete demographic details of all the patients were obtained. Blood samples were obtained, and serum bilirubin levels were assessed preoperatively at baseline. At postoperative 24 hours and 72 hours, serum bilirubin profile was re-evaluated. Comparison of the alterations in the serum bilirubin levels was made. All the results were recorded and analyzed by SPSS software.

RESULTS

In the present study, we evaluated a total of 100 subjects, out of which 30 subjects were of less than 40 years of age while the remaining 70 were more than 40 years of age. Out of 100, 15 subjects were males while remaining 85 were females. During preoperative period, postoperative 24 hours and postoperative 72 hours, mean total serum bilirubin levels were found to be 0.82 mg/dL,

1.42 mg/dL and 0.83 mg/dL respectively; on comparing, the results were found to be statistically significant. During preoperative period, postoperative 24 hours and postoperative 72 hours, mean serum direct bilirubin levels were found to be 0.22 mg/dL, 0.45 mg/dL and 0.26 mg/dL respectively; on comparing, the results were found to be statistically significant.

Table 1: Distribution of subjects according to age group

Age group (years)	Frequency	Percent
Less than 40	30	30
More than 40	70	70
Total	100	100.0

Table 2: Alterations in serum bilirubin levels

Bilirubin levels (mg/dL)	Mean	SD	p- value
Pre- op Total Bilirubin	0.82	0.11	0.002*
Post- op at 24 hr Total Bilirubin	1.42	0.51	
Post-op at 72 hr Total Bilirubin	0.83	0.08	
Pre-op Direct Bilirubin	0.22	0.05	0.012*
Post-op at 24 hr Direct Bilirubin	0.45	0.15	
Post-op at 72 hr Direct Bilirubin	0.26	0.05	

*: Significant

DISCUSSION

During the past decade laparoscopic cholecystectomy (LC) has become the procedure of choice in the surgical treatment of symptomatic biliary lithiasis. The operation is not completely risk-free, some incidents and complications being more frequent than with open cholecystectomy (OC).⁷⁻¹⁰ The present study was conducted for assessing alterations in serum bilirubin levels pre and post Laparoscopic cholecystectomy (LC). In the present study, we evaluated a total of 100 subjects, out of which 30 subjects were of less than 40 years of age while the remaining 70 were more than 40 years of age. Out of 100, 15 subjects were males while remaining 85 were females. During preoperative period, postoperative 24 hours and postoperative 72 hours, mean total serum bilirubin levels were found to be 0.82 mg/dL, 1.42 mg/dL and 0.83 mg/dL respectively; on comparing, the results were found to be statistically significant. In a study conducted by Sefik et al, one hundred patients who underwent Laparoscopic Cholecystectomy [LC] (n = 50) or Open Cholecystectomy [OC] (n = 50) were included. The groups were similar in age, sex, weight and height. Following liver function tests (total bilirubin; gamma-glutamyl-transferase, GGT; alkaline phosphatase, ALP), aspartate aminotransferase (AST), alanine aminotransferase (ALT) and lactate dehydrogenase

(LDH) were obtained preoperatively and at 24 and 48 hrs postoperatively. The results indicated that LC is associated with transient elevation of ALT and AST. The disturbances in the function of the liver after LC are self-limited and not associated with any morbidity in patients with a normal liver function.¹¹

During preoperative period, postoperative 24 hours and postoperative 72 hours, mean serum direct bilirubin levels were found to be 0.22 mg/dL, 0.45 mg/dL and 0.26 mg/dL respectively; on comparing, the results were found to be statistically significant. Hasukić S et al, evaluated the changes in liver function tests after high-pressure LC (HPLC; 14 mmHg) and low-pressure LC (LPLC; 7 mmHg). For their study, 50 patients were randomly assigned to undergo either HPLC (n = 25) or LPLC (n = 25) Liver function tests including total bilirubin, gamma-glutamyltransferase (GGT), alkaline phosphatase (ALP), aspartate aminotransferase (AST), and alanine aminotransferase (ALT) were obtained preoperatively, then 24 and 48 h postoperatively. All patients had normal values on the preoperative liver function tests. The anesthesiologic protocol was uniform. The findings showed that ALT after 24 h and 48 h and AST after 24 h were increased in the patients who underwent HPLC. The AST levels after 48 h were

statistically unchanged from baseline in both groups. Total bilirubin, ALP, and GGT levels remained unchanged from baseline in both groups, without a significant difference between the two groups. Because LPLC minimizes adverse hemodynamic effects on hepatic function, a low-pressure pneumoperitoneum should be considered for patients with compromised liver function, particularly those undergoing prolonged laparoscopic surgery.¹²

Al-Luwaizia KR et al evaluated the effect of pneumoperitoneum in LC on liver enzymes and serum bilirubin in comparison with open cholecystectomy (OC). A prospective case control study involved 74 patients treated by LC, and 30 patients treated by OC as a control group. Blood samples were taken 24 hours preoperatively and 24 hours after operation for biochemical tests. There were significant increases in serum bilirubin, Aspartate aminotransferase (AST), alanine aminotransferase (ALT), and Lactate dehydrogenase (LDH) levels in LC group postoperatively when compared with the OC group, while there were no significant changes in serum alkaline phosphatase (ALP). It has been concluded that, serum bilirubin and liver enzymes elevation could be attributed to the negative effects of the pneumoperitoneum on the hepatic blood flow.¹³

CONCLUSION

Serum bilirubin levels are significantly altered among patients undergoing Laparoscopic cholecystectomy.

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