



## **Changes in the serum ALT, ALP and Bilirubin level after laparoscopic surgery in Cholelithiasis**

**Muhammad Jaseem Khan<sup>1</sup>, Ahmad Ali<sup>1</sup>, Anwar Ullah<sup>1</sup>, Noor Ullah<sup>1</sup>, Mohammad Danish<sup>2</sup>**

<sup>1</sup>Institute of Paramedical Sciences, Khyber Medical University Peshawar Pakistan

<sup>2</sup>Rehman Medical Institute Peshawar Pakistan

Correspondence: Muhammad Jaseem Khan, PhD

Email: [Jaseem.ipms@kmu.edu.pk](mailto:Jaseem.ipms@kmu.edu.pk)

### **ABSTRACT**

*Cholelithiasis is one of the significant diseases in the world and one of the most common diseases presenting to emergency department of the hospitals. Laparoscopic surgery is an important treatment for the cholelithiasis and its effectiveness is measured by analyzing the pre and post surgery levels of serum ALT, ALP and bilirubin. The present study was designed to estimate the changes of ALT, ALP and bilirubin before and after Laparoscopic surgery. This is a retrospective study in which 100 patients from different hospital were enrolled. A venous blood pre and post surgery (24 hours) was collected for alanine aminotransferase (ALT), alkaline phosphatase (ALP) and Bilirubin. Alanine aminotransferase (ALT), alkaline phosphatase (ALP) and Bilirubin were measured by ARCHITECT c4000 Clinical Chemistry (Abbott USA). The data was analyzed using Statistical Package for the Social Sciences (SPSS Version 13.0, Chicago, IL). In the study group of 100, 49 were male and 51 were female. The male female ratio was approximately same (1:1). The patients were diagnosed for cholelithiasis by ultrasonography, biochemical analysis of the liver and clinical investigation. ALT, ALP and Bilirubin were found high before surgery. These analytes were decrease significantly after surgery. It has been observed that a significant decrease observed in the patients ALP value ( $p = 0.001$ ) while AST ( $p = 0.052$ ) and bilirubin ( $p = 0.56$ ) have no significant decreased after surgery. A significant decline in the ALP was observed while decline in the ALT and bilirubin was observed but not significant statistically.*

**Key words:** Cholelithiasis, ALT, ALP, bilirubin, laparoscopic surgery

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### **INTRODUCTION**

cholelithiasis is one of the significant disease in the world and one of the most common disease presenting to emergency department of the hospitals [5]. It is becoming an increasingly common cause of morbidity [11]. Gall bladder and biliary tract disorders affect worldwide. Gallstone cholelithiasis is (95%) is more than other diseases of biliary tract. Minimum 2% of United States budget is spent on gall stones and its complications. In United States about 1 million new cases of gall stones are diagnosed annually. It is one of the disorders of gastrointestinal tract affecting 10% people in America and Europe, but in Asian population its occurrence is about 3-15% [10]. In Pakistan its ratio is approximately 4% in males while in female its ratio is high which is about 14.2 % [4]. Symptoms of gallbladder stones are right upper quadrant pain and tenderness, other symptoms include fever, chills, nausea, and vomiting [2]. Chemically gall stone are composed of cholesterol (50-100% cholesterol), calcium salts pigmented with bilirubin and mixed stones (22-80% cholesterol CaCO<sub>3</sub>, Palmitate phosphate, bilirubin and bile pigments) [13]. Gall stone block the bile duct hence decrease the secretion and transportation of the bile. The obstruction of the bile duct results in the elevated level of the Alanine transaminase (ALT), alkaline phosphatase (ALP) and bilirubin in the serum [8]. High levels of the liver enzymes and Bilirubin leads to secondary pathologies hence removal of the gall stone is necessary to treat the patients. A slight further increase in the liver enzymes and bilirubin is common after surgery but it drops down to normal after time laps [8, 14].

Laparoscopic surgery is an important treatment for the cholelithiasis and its effectiveness is measured by analyzing the pre and post surgery levels of serum ALT, ALP and bilirubin. The present study was designed to estimate the changes of ALT, ALP and bilirubin before and after Laparoscopic surgery.

## MATERIAL AND METHODS

This is a retrospective study in which 100 patients from different hospital were enrolled. A venous blood pre and post surgery (24 hours) was collected for alanine aminotransferase (ALT), alkaline phosphatase (ALP) and Bilirubin. The patients with history of hepatitis B, C, Bile duct Injury, diabetes mellitus and bleeding from the liver were excluded from the study.

Laparoscopic cholecystectomy was done by general anesthesia with intravenous anesthesia induction and also used volatile anesthesia under ventilation. Vecuronium bromide, sodium thiopental were used for general anesthesia and nitrous oxide and oxygen mixture were as volatile anesthesia. Same anesthetic chemical was used for all patients with titrated dosage.

During operation blood pressure (BP), pulse rates and oxygen saturation of the patients were closely monitored. Changes in blood pressure were not noticed in any patient. The medicine used after operation includes antibiotics (ampicillin or cefazolin) and diclofenac sodium for postoperative pain. Normal saline and dextrose water were given to all patients within 24 hours.

alanine aminotransferase (ALT), alkaline phosphatase (ALP) and Bilirubin were measured by ARCHITECT c4000 Clinical Chemistry (Abbott USA). The data was analyzed using Statistical Package for the Social Sciences (SPSS Version 13.0, Chicago, IL).

## RESULTS AND DISCUSSION

In the study group of 100, 49 were male and 51 were female. The male female ratio was approximately same (1:1). The age wise distribution of the patients is shown in Table 1. The patients were diagnosed for cholelithiasis by ultrasonography, biochemical analysis of the liver and clinical investigation.

ALT, ALP and Bilirubin were found high before surgery. These analytes were decrease significantly after surgery. It has been observed that a significant decrease observed in the patients ALP value ( $p = 0.001$ ) while AST ( $p = 0.052$ ) and bilirubin ( $p = 0.56$ ) have no significant decreased after surgery Table. 2).

After CVD Cholethiasis is the 2<sup>nd</sup> most prevalent disease, have some impact on economy. GIT suffers from variety of diseases but Cholethiasis is one of the most expensive diseases. In the United States approximately 500,000 cholecystectomies are done annually, the cost exceeds 5 billion dollars. Cholethiasis is considered as an avoidable death cause [10]. About 95% diseases of biliary tract are due to gallstones [9].

The frequently reported age group for Cholethiasis 40-50 years [3, 4]. Our findings are consistent to these reports. In the present study we report significant decrease in the ALP ( $p = 0.001$ ), the AST and bilirubin decreases however the decline is slow and non significant AST ( $p = 0.052$ ) and bilirubin ( $p = 0.56$ ). Similar findings were reported by AA Fikry *et al.*, [5], the decline in the ALP post surgery was significant ( $p = 0.001$ ) while the ALT and bilirubin is not significant AST ( $p = 0.052$ ) and bilirubin ( $p = 0.56$ ) [4]. Ahmad *et al.*, [1] also reported similar results, post operative decline in the ALP ( $p=0.241$ ) was not significant however, AST ( $p<0.05$ ) and bilirubin AST ( $p<0.05$ ) decreases significantly post laparoscopic surgery [1]. The findings are contrary to the results of our study. In a group Cholethiasis patients decrease in the ALP ( $P\leq 0.001$ ) was significant while bilirubin and ALT showed no significant decline, the results are consistent with our study [12].

**Table 1:** Age wise distribution of the patients

Age Group	Frequency	Percentage (%)
18-29	19	19%
30-41	35	35%
42-53	32	32%
54-65	12	12%
66-79	02	02%

**Table 2:** Statistical analysis of ALP, ALT and Bilirubin Before and After Laparoscopic cholecystectomy

Group	Before LC			After LC			P Value	95% CI	
	Range	Mean	S.D	Range	Mean	S.D		Lower	Upper
ALP	716-130	310.74	116.993	412-125	227.06	53.77	0.001	65.263	102.096
BILIRUBIN	9.1-0.1	2.555	2.042	2.6-0.1	0.982	0.446	0.056	1.174	1.969
ALT	1230-22	158.43	203.32	66-21	41.69	10.45	0.052	75.941	157.538

**CONCLUSION**

According to this study it was statistically determined that the percentage and frequency of gallstone disease was high in patients aged between 30-41 years which is 35%. The percentage of this study is very low in patient aged between 66-79 years which is only 2%. According to this study it was showed that the frequency of male and female is equal. Statistically find out results showed that there was significant increase in ALP level (P=0.001) but there were no significant decrease in the level of ALT and bilirubin.

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**CONFLICT OF INTEREST**

No conflict of Interest

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