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## A study to assess the bilirubin profile in the patients of cholecystectomy

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### Abstract

**Background:** There are very little studies in the area of post-surgical complications of cholecystectomy. It was reported that the patients who had underwent the gall bladder removal surgery develops some dysfunction in the liver profile.

**Objectives:** The present study was undertaken to study the bilirubin profile in the patients of cholecystectomy.

**Methods:** The present study involved 30 patients of gastro intestinal surgery, within the age group of 20 to 60 years of age. Both the genders (males =15), Females =15) were included in the study. Thorough clinical evaluation was conducted to all the patients. Direct and total bilirubin levels were estimated using the standard methods in the literature.

**Results:** The two-tailed P value is less than 0.0001 for total bilirubin. By conventional criteria, this difference is considered to be extremely statistically significant. The mean of Group One minus Group Two equals 0.171000. 95% confidence interval of this difference: From 0.146150 to 0.195850. The two-tailed P value is less than 0.0001 for direct bilirubin. By conventional criteria, this difference is considered to be extremely statistically significant. The mean of Group One minus Group Two equals -0.129000. 95% confidence interval of this difference: From -0.144995 to -0.113005.

**Conclusion:** There was decrease in the total bilirubin levels but there was increase in the direct bilirubin levels in the patients. This study results support the views of earlier research. The study also recommends detailed research in this area.

**Keywords:** Cholecystectomy, gall bladder, bilirubin

### Introduction

Bilirubin is the end product of metabolism of hemoglobin. After completion of the life time, the red cells are processed in the reticulo-endothelial system and bilirubin is formed. Now this bilirubin is stored in the gall bladder and released as it is required <sup>[1]</sup>. When there is severe gall stones in the gall bladder, there is a need to remove the gall bladder surgically <sup>[3]</sup>. This process is called as cholecystectomy <sup>[2]</sup>. It is one of the most common surgeries that happen to abdomen in the surgical care. Single incision laparoscopic procedure is now most commonly used in the place of four port laparoscopic surgery <sup>[4]</sup>. There are very little studies in the area of post-surgical complications of cholecystectomy <sup>[5]</sup>. It was reported that the patients who had underwent the gall bladder removal surgery develops some dysfunction in the liver profile. The present study was undertaken to study the bilirubin profile in the patients of cholecystectomy.

### Materials and methods

**Study design:** Observational study

**Sampling method:** Convenient sampling

**Study population:** The present study involved 30 patients of gastro intestinal surgery, within the age group of 20 to 60 years of age. Both the genders (males =15), Females =15) were included in the study. Thorough clinical evaluation was conducted to all the patients. Patients undergoing laparoscopic cholecystectomy were included in the study. Voluntary informed consent was obtained from all the patients before the study. Willing participants, who are not having any severe complications, were included in the study. Unwilling patients with severe

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complications and using any drugs that are toxic to the liver were excluded from the study.

**Method of data collection:** Direct and total bilirubin levels were estimated using the standard methods in the literature [6].

**Ethical consideration:** The study proposal was approved by an institutional human ethical committee. Informed consent was obtained from all the participants. Confidentiality of data was maintained.

**Data analysis:** Data was analyzed using SPSS 20.0 version. Demographic data was presented as frequency and percentage. Student t-test was used to assess the significance of the difference between the groups.

**Results:** Table 1 presents the age wise distribution of cases. Table 2 presents the age wise distribution of cases in male patients. Table 4 presents the pre and post-operative bilirubin levels in patients. The two-tailed P value is less than 0.0001 for total bilirubin. By conventional criteria, this difference is considered to be extremely statistically significant. The mean of Group One minus Group Two equals 0.171000. 95% confidence interval of this difference: From 0.146150 to 0.195850. The two-tailed P value is less than 0.0001 for direct bilirubin. By conventional criteria, this difference is considered to be extremely statistically significant. The mean of Group One minus Group Two equals -0.129000. 95% confidence interval of this difference: From -0.144995 to -0.113005. Table 3 presents the age wise distribution of cases in female patients.

**Table 1:** Age wise distribution of cases

Age group in years	Number of patients (n=30)	percentage
<30	4	13.33
30-40	8	26.66
41-50	12	40
51-60	6	20

Data was presented as frequency and percentage

**Table 2:** Age wise distribution of cases in male patients

Disease	Number of patients (n=15)	percentage
<30	1	6.66
30-40	4	26.6
41-50	6	40
51-60	3	20

Data was presented as frequency and percentage

**Table 3:** Age wise distribution of cases in female patients

Disease	Number of patients (n=15)	percentage
<30	3	20
30-40	4	26.6
41-50	6	40
51-60	2	13.3

Data was presented as frequency and percentage

**Table 4:** Pre and post-operative bilirubin levels in patients

Bilirubin	Pre-operative	Post-operative	P value
Total	0.824±0.011	0.653±0.004	<0.0001***
Direct	0.224±0.002	0.353±0.007	<0.0001***

Data was presented as Mean and SEM. (\*\*\*)P<0.001 is significant)

**Discussion**

After the completion of the life span, the red cells undergo

degeneration and as a result the hemoglobin will be expelled. This hemoglobin is further processed and metabolized and forms bilirubin. The bilirubin is the end product of metabolism of hemoglobin after the life span of the hemoglobin [7]. Gall stones when the severity is very high, there is only option in the patient care that is surgery. Surgical removal of gall bladder is called as cholecystectomy [8]. It was suggested that post-surgical removal of gallbladder patients develop some complications in the functions of liver [8]. One of the most common observations, that the patients should be advised to limit the fat diet [9]. The recommended diet for these patients is more of carbohydrates and fluids that can be easily digested and do not require the bilirubin. Bilirubin is a key component in the digestion as well as absorption of the fat. When bilirubin is unavailable the digestion of fat will not be so easy and there will be increase in the excretion of fecal fat which is called clinically as steatorrhea [10]. Earlier studies reported that there are alterations in the liver enzymes as well along with the levels of bilirubin [11]. Interestingly, there is increase in the both total and direct bilirubin was reported in a study [12]. Also there exist studies that reported no significant changes in the bilirubin levels [13]. So there is a big debate on the alterations of the levels of bilirubin after the surgical removal of gall bladder. Hence, the present study was undertaken. The present study was undertaken to study the bilirubin profile in the patients of cholecystectomy. Majority of patients belong to the age group of 41-50 (40%) years. Same is the view in gender wise distribution also. There was decrease in the total bilirubin levels but there was increase in the direct bilirubin levels in the patients. The study recommend detailed multi center studies as the results cannot be generalized from single center study.

**Conclusion**

There was decrease in the total bilirubin levels but there was increase in the direct bilirubin levels in the patients. This study results support the views of earlier research. The study also recommends detailed research in this area.

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