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Research Article

A CROSS SECTIONAL STUDY ABOUT MEASURING CRP LEVEL BY VALUATION OF STRESS RESPONSE AFTER OPEN CHOLECYSTECTOMY AND LAPAROSCOPIC CHOLECYSTECTOMY

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Abstract:

Objective and Design: We designed a cross-sectional and observational study to measure the CRP Level by evaluating operative stress response after Laparoscopic Cholecystectomy (LC) and Open Cholecystectomy (OC).

Venue and Time-Period: This study was managed in the General and Vascular Surgery Department of Bahawal Victoria Hospital, Bahawalpur and the time period was of 11 months year (June, 2017 to April, 2018).

Methods: We enrolled patients for the study, who were admitted in our hospital with symptomatic cholelithiasis disease. Patients admitted in our hospital on the bases of their demographic data and pathologic diagnosis for the diagnostic of cholelithiasis and then decided for cholecystectomy. The cases were randomly allocated to open cholecystectomy and laparoscopic cholecystectomy groups. CRP levels were measured preoperatively and postoperatively.

Results: All patients (total=92, men=51, women=41) admitted for the Laparoscopic Cholecystectomy LC and Open Cholecystectomy OC have 38.19 ±9.263 the mean age and the SD. The two randomized groups of LC and OC were undergoing for the comparison of CRP levels for the postoperative follow up of 4 hours, 8 hours and 24 hours. Postoperative mean CRP readings in mg/dl for LC group were 8.12 ±2.89, 15.19 ±6.63 and 25.11 ±9.92 and for OC group were 11.90 ± 1.52, 22.67 ±3.72 and 35.28 ±6.34 after 4, 8 and 24 hours respectively. Means of both groups were compared by T-Test and found no significant difference between two, i.e P-value is 0.000. Our study did not face any complication and mortality case.

Conclusion: CRP level is a beneficial indicator tool to measure the postoperative stress response in patients after Laparoscopic Cholecystectomy (LC) and Open Cholecystectomy (OC).

Keywords: Laparoscopic Cholecystectomy, Open Cholecystectomy, CRP level, Stress response, Cholelithiasis.

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INTRODUCTION:

Some studies have confirmed that Laparoscopic Cholecystectomy (LC) was much better than Open Cholecystectomy (OC), especially for the complicated cases of cholelithiasis. It is opted due to its unique advantages of minimal invasive surgery, lesser postoperative pains, less hospital stay, minimal wounds and marks, short recovery time and more economical [1 to 9].

The stress response is the component of the systemic reaction to surgery which encompasses a wide range of endocrinological, immunological and haematological effects and it is due to the hormonal and metabolic changes which follow injury (surgery) or trauma. The stress responses to surgical incision include derangements of metabolic and physiological processes which induce perturbations in the inflammatory, hormonal, acute phase, and genomic responses. CRP level is an imperative acute phase reactant that plays an important role in inflammation and is a sensitive inflammatory indicator [10].

Different studies have observed that laparoscopic cholecystectomy induces less stress response than open cholecystectomy. According to Luo et al study noticeable increase in postoperative CRP levels is observed in patients with laparoscopic cholecystectomy LC compared to open cholecystectomy OC with statistically considerable values [11]. Cheng et al has concluded his study by comparing the stress in patients with laparoscopic cholecystectomy LC to open cholecystectomy OC with the result of decreased morbidity, decreased postoperative stress [12]. In another perspective CRP is related with size of the surgery and degree of invasiveness of the procedure [13]. It is also concluded by study of Asghar et al that as compared to open cholecystectomy, laparoscopic cholecystectomy had the reduced level of stress response and less metabolic interference [14].

The purpose of our study is to verify the degree of postoperative stress response in the patients those underwent laparoscopic cholecystectomy and open cholecystectomy by measuring the CRP levels for the sake of patients' assistance by minimal invasive surgery.

METHODS AND MATERIALS:

We started our study in the General and Vascular Surgery Department of Bahawal Victoria Hospital Bahawalpur and the time period was of 11 months year (June, 2017 to April, 2018). The patients, total 92 with cases of cholelithiasis admitted for the Laparoscopic Cholecystectomy LC and Open Cholecystectomy OC. The gender division and age categorization were as the men were 51 and women were 41 and the age was 19 years to 60 years with the 38.19 ± 9.263 the mean age and the SD.

As a study record the name, age, gender, patient number and date of operation were recorded. Surgical operations were done by the expert surgeons with the assistance of clinical researchers. Exclusion category comprised on the chronic HCV and hepatitis B cases, neurological disease or psychiatric cases, severe infection, cases with bleeding disorder, pregnant women cases and metabolic abnormalities. Two randomized groups were made named as LC group and OC group for the comparison of CRP levels for the postoperative follow up of 4 hours, 8 hours and 24 hours.

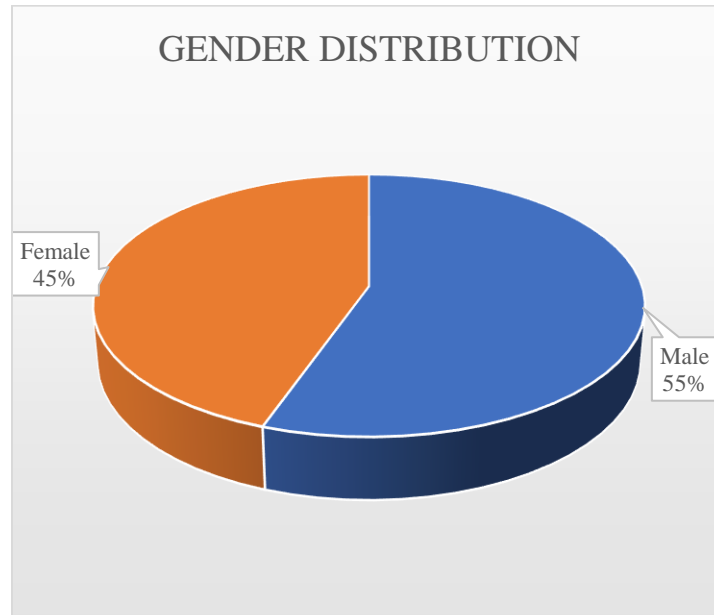
The upper limit for the readings of CRP levels was selected as 3mg/dl by ELISA. For the CRP the upper reference limit was 3mg/dl and measured by ELISA method. Data analysis was performed by the software SPSS v-20.0. CRP, patients' age and symptoms duration were recorded in the terms of mean and standard deviation and the qualitative variables were the frequency and percentage. The preoperative and postoperative measurements of CRP levels for the Laparoscopic Cholecystectomy LC and Open Cholecystectomy OC were taken by using T-Test having P-value less than 0.005.

RESULTS:

All patients total of 92 admitted for the Laparoscopic Cholecystectomy LC and Open Cholecystectomy OC. The gender division and age categorization were as the men were 51 and women were 41 and the age was 21 years to 63 years with the 38.19 ± 9.263 (Table-1) the mean age and the SD.

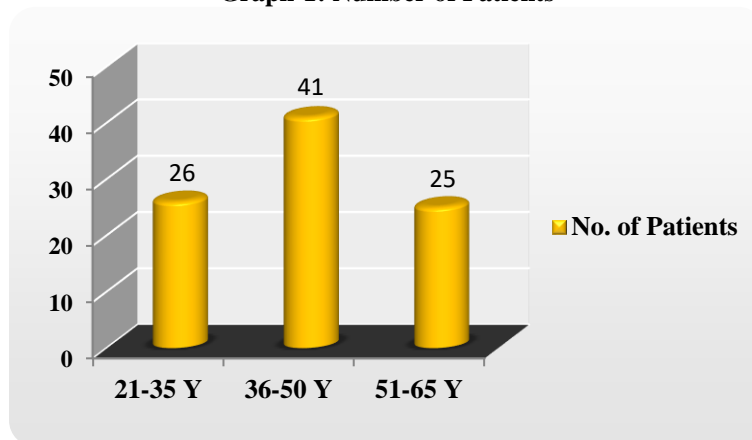
Table-1.1 Gender Distribution

Gender	Strength	Percentage	Age Mean \pm SD
Male	51	55.43%	38.19 \pm 9.263
Female	41	44.57%	
Total	92	100%	

**Table-1.2 CRP Levels Readings**

CRP	Mean \pm SD
After 4 Hour	10.01 \pm 3.11
After 8 Hour	18.93 \pm 5.92
After 24 Hour	29.97 \pm 9.83

The mean age of men and women was roughly the same. Age wise grouping of the patients comprised as 26 patients were from 21-35year group, 41 patients were from 36-50year group and 25 patients were from 51-65year group (Graph-1).

Graph-1: Number of Patients

We made the two groups by selecting the patients randomly in either of group regard less of their gender, age and area of patient, the one group for Laparoscopic Cholecystectomy having the 46 patients and second group for Open Cholecystectomy

having the 46 patients. Patients of both randomized groups of LC and OC were operated and after operation of CRP levels were sent to testify the surgical stress response for the postoperative follow up of 4 hours, 8 hours and 24 hours.

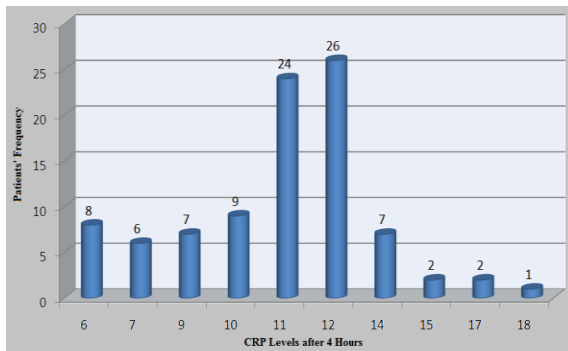
Postoperative mean CRP readings in mg/dl for LC group were 8.12 ±2.89, 15.19 ±6.63 and 25.11 ±9.92 and for OC group were 11.90± 1.52, 22.67 ±3.72 and 35.28 ±6.34 after 4, 8 and 24 hours respectively (Table-2). While for the both surgeries the mean CRP levels in mg/dl after 4 hours was 9.54±2.9, after 8 hours was 17.66±5.86 and after 24 hours was 29.85±9.67. The maximum patients had the CRP

values in between 11-12 mg/dl in 4 hours Graph-2. While, the CRP values of 19-21 mg/dl and 33-41 mg/dl were recorded for the 8 hour and 24 hours as in Graph-3, Graph-4 respectively. Means of both groups were compared by T-Test and found no significant difference between two, i.e. P-value is 0.000. Our study did not face any complication and mortality case.

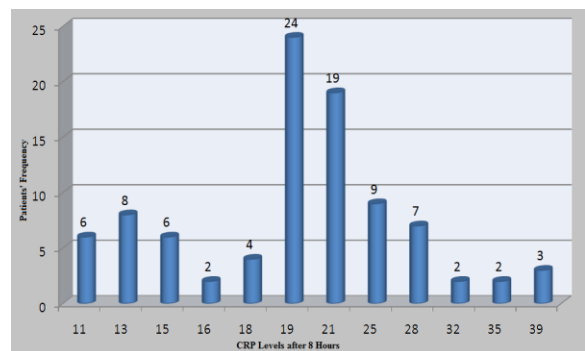
Table-2: CRP Levels (Mean±SD) in OC and LC Groups

CRP LEVELS	LC Procedure	OC Procedure	T-TEST
	MEAN±SD	MEAN±SD	
After 4 hours	8.12 ±2.89	11.90± 1.52	0.000
After 8 hours	15.19 ±6.63	22.67 ±3.72	0.000
After 24 hours	25.11 ±9.92	34.83±6.12	0.000

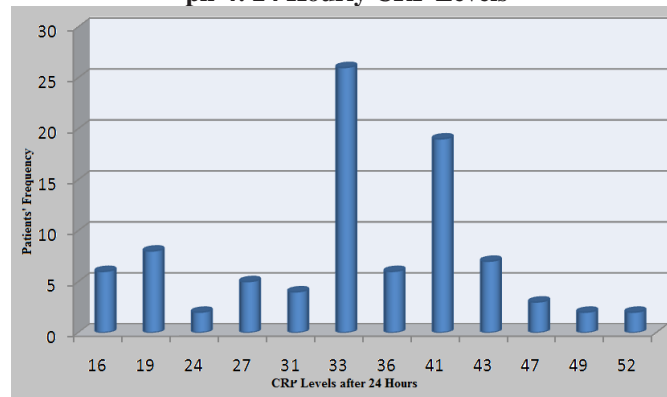
Graph-2: 4 Hourly CRP Levels



Graph-3: 8 Hourly CRP Levels



Graph-4: 24 Hourly CRP Levels



DISCUSSION:

It is very obvious from different studies that in all over the world laparoscopic cholecystectomy LC is the very commonly repeated method of surgery per yearly and found very less complications and very minor amount of mortalities having the rate <1.5% and <0.1% respectively [14]. Some studies have

confirmed that Laparoscopic Cholecystectomy (LC) was much better than Open Cholecystectomy (OC) since 1991 due its unique benefits of less morbidity, less mortality and short recovery time [15] Level of CRP with higher values is the marker for the inflammation in blood. It may be the reason for many problems covering from infection to the diseases of

heart and cancer. While studies revealed that CRP level become high after the surgery procedures either it is open or laparoscopic [16,17,18,19]. Surgical invasions as well as surgery methods are referred as the type of trauma and these are followed by the inflammation in the blood, immunological and haematological effects and hormonal changes [20,21,22,23,24]. It is also understood assumption that postoperative stress response and other complications are very less in the patients those underwent laparoscopic cholecystectomy than the open cholecystectomy because of minimum invasive surgery.

More similar to other studies on the subject objectives i.e. stress response after the laparoscopic cholecystectomy for the cases of cholelithiasis, the outcomes and facts derived from our study are alike [25,26,27]. In our study the maximum patients were with the age from 22 to 37 years and then from the age of 35 to 52 years and the cholelithiasis diagnostics were more in the women than the in the men. It is clear from our study that the degree of postoperative stress response less in the patients those underwent laparoscopic cholecystectomy than the open cholecystectomy by measuring the CRP levels. By making the comparison of the CRP levels of both groups we observed the no significant difference between two, i.e P-value is 0.000. However, for the cases with complications and high risk cases still the open cholecystectomy is preferable. The reflections from the other studies show that before the laparoscopic surgery if the CRP level became high, TLC reading is high and the complicated increased size of gall bladder then this operation is converted into open cholecystectomy. Due to these reasons higher conversion rate is noticed. This conversion rate in some studies has found as according to Ambe et al study, due the high preoperative CRP level this enhanced conversion rate is found. While in the study of Kohli et al it was found that after the open cholecystectomy the CRP level was noticed remarkably high rather than laparoscopic cholecystectomy so why is was certified that laparoscopic cholecystectomy is less traumatic. In the open cholecystectomy the cuts create max trauma and so why acute phase response rises. Because of this laparoscopic cholecystectomy has the advantage of reduction in trauma, minimal invasive surgery, less hospital stays, minimal wounds and marks, short recovery time and more economical.

CONCLUSION:

Level of CRP with higher values is the practical marker for the inflammation in blood by which the postoperative stress response can be measured in patients after LaparoscopicCholecystectomy (LC)

andOpen Cholecystectomy (OC).

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