



A PROSPECTIVE STUDY OF BLOOD CRP LEVEL AS PREDICTOR OF DIFFICULT LAPAROSCOPIC CHOLECYSTECTOMY

General Surgery

Dr. Dinesh Kumar Yadav*	Resident Doctor, Department Of General Surgery, Jln Medical College & Hospitals, Ajmer Raj. *Corresponding Author
Dr. Shiv Kumar Bunkar	Senior Professor & Hod, Department Of General Surgery, Jln Medical College & Hospitals, Ajmer Raj.
Dr. Naresh Meena	Associate Professor, Department Of General Surgery, Jln Medical College & Hospitals, Ajmer Raj.

ABSTRACT

Laparoscopic cholecystectomy can safely be declared as the gold standard for dealing with any kind of benign gall bladder disorder. CRP is a reliable preoperative factor to predict difficult laparoscopic cholecystectomy and its conversion. It is an acute-phase protein used clinically to diagnose infectious and inflammatory disease and monitor response to treatment. A prospective hospital-based study on 150 cases assessed for preoperative radiological and intraoperative findings of difficult laparoscopic cholecystectomy and will be correlated with preoperative blood CRP levels at Department of General Surgery, JLN Medical College & Hospitals, Ajmer. Females 119 (79.33%) were more compared to males 31 (20.67%) and mean age is 35.73±11.55 years. Simple laparoscopic cholecystectomy was present in 121 (80.67%) patients and difficult laparoscopic cholecystectomy was in 29 (19.33%) patients. Mean CRP level upto 22 was 15.01±11.40 for simple cholecystectomy and of >22 was 15.62±10.13 for difficult cholecystectomy. Grade I in 76 (50.67%) patients, Grade II 38 (25.33%) patients, Grade III 19 (12.67%) patients and Grade IV 17 (11.35%) patients. The laparoscopic cholecystectomy were significant while comparing with cases upto 45 minutes (simple) and >45 minutes (difficult cases). C Reactive protein can be potent predictor of difficult laparoscopic cholecystectomy and high CRP level have higher chances of intra operative complications or conversion to open.

KEYWORDS

C-reactive protein, laparoscopic cholecystectomy, gall bladder stone.

INTRODUCTION :

Laparoscopic cholecystectomy can safely be declared as the gold standard for dealing with any kind of benign gall bladder disorder¹

The advantages of Laparoscopic Cholecystectomy are earlier return of bowel function, less post-operative pain, cosmetic, shorter duration of hospital stay and also earlier return to full activity

At times Laparoscopic Cholecystectomy becomes difficult, it takes longer duration even with bile/stone spillage and occasionally it requires conversion to open cholecystectomy (OC). The difficult laparoscopic cholecystectomy is defined on the basis of intraoperative findings such as Calot's triangle anatomy, gall bladder wall thickness, adhesions, bleeding and peri gall bladder collection.

CRP is a reliable preoperative factor to predict difficult laparoscopic cholecystectomy and its conversion. CRP is the first acute-phase protein to be described and is an exquisitely sensitive systemic marker of inflammation and tissue damage².

CRP may, therefore, be useful as a screening test to detect an inflammatory response early in its course, and also for monitoring disease activity and response to therapy in conditions where CRP is raised³. Also, it may benefit patients because they can be informed of the possibility of complications and conversion to open procedure. Patients with preoperatively high CRP have higher chance of complication intraoperative and high chances of conversion to open.

The CRP concentration is thus a very useful nonspecific biochemical marker of inflammation, measurement of which contributes importantly to (a) screening for organic disease, (b) monitoring of the response to treatment of inflammation and infection, and (c) detection of intercurrent infection in immunocompromised individuals, and in the few specific diseases characterized by modest or absent acute-phase responses⁴.

Nassar Difficulty Grading Scale⁵

We Grade The Difficulty Of The Procedure Using :

The Nassar Scale (grades 1-4). This scale was published in 1995 and graded operative findings from the gallbladder, cystic pedicle and associated adhesions.

The scale is as follows:

Grade 1:

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- Gallbladder-floppy, non-adherent.
- Cystic pedicle-thin and clear.
- Adhesions-Simple up to the neck/Hartmann's pouch.

Grade 2:

- Gallbladder-Mucocele, Packed with stones.
- Cystic pedicle -Fatladen.
- Adhesions-Simple up to the body.

Grade 3:

- Gallbladder- Deep fossa, Acute cholecystitis, Contracted, Fibrosis, Hartmanns adherent to CBD, Impaction.
- Cystic pedicle - Abnormal anatomy or cystic duct short, dilated or obscured.
- Adhesions-Dense up to fundus; Involving hepatic flexure or duodenum.

Grade 4:

- Gallbladder-Completely obscured, Empyema, Gangrene, Mass.
- Cystic pedicle -Impossible to clarify.
- Adhesions-Dense, fibrosis, wrapping the gallbladder, Duodenum or hepatic flexure difficult to separate. The grading system is designed to be used as an overall summary of the operative conditions found, and the worst factor found in the individual aspect of either the 'Gall bladder', 'Cystic Pedicle' or 'Adhesions' should be used to define the final overall grade.

Aims And Objectives

- Evaluate the role of blood CRP level as a predictor of difficult laparoscopic cholecystectomy or its conversion based on intraoperative findings.

MATERIAL AND METHODS

This descriptive analysis of laparoscopic cholecystectomy with special reference to CRP level and difficult dissection was done from January 2023 to July 2024 in General Surgery wards, JLN Medical College and Hospital, Ajmer.

This is a prospective hospital-based study. In this study, all cases were assessed for intraoperative findings of difficult laparoscopic cholecystectomy (based on Nassar difficulty Grading Scale) and were correlated with preoperative blood CRP levels.

Sample Size

A total of 150 patients meeting inclusion and exclusion criteria were evaluated.

Methodology

Written informed consent was obtained from all study subjects before enrolment in the study.

All patients with cholelithiasis by clinical and ultrasound findings were admitted to General Surgery department. Laparoscopic cholecystectomy was performed after the patient was assessed as fit for general anaesthesia. All cases undergo chest X-ray and urine analysis to exclude other causes of increased CRP level.

CRP results were collected on patients pre-operatively (one day before surgery).

Following evaluation the patients were subjected to laparoscopic cholecystectomy and the following operative parameters : access to peritonealcavity (easy/difficult), bleeding during surgery (normal / abnormal), gall bladderbed dissection (easy/difficult), injury to duct / artery, extraction of gall bladder (easy/difficult), or conversion to open surgery were noted.

Inclusion Criteria

- Patient clinically and Radiologically (USG abdomen) diagnosed as Cholelithiasis and planned for laparoscopic Cholecystectomy
- Age range – 18 to 50 years of age

Exclusion Criteria:

- Preoperative ERCP and pancreatitis.
- High BMI (>35)
- Proven congenital anomaly of gall bladder
- Previous abdominal surgery
- Any conditions increasing CRP level and immunocompromised patients (cigarette smoking , common cold, depression, diabetes, pregnancy)
- Patients with CBD calculus, dilated CBD where CBD exploration isrequired
- Patients with choledocolithiasis, CA gall bladder, previous proven congenital anomaly of gall bladder, Empyema gall bladder.
- Patients unfit for laparoscopic cholecystectomy or Patients not willing forsurgery

Statistical Analysis

Observations were tabulated according to the pre-designed proforma. To describe about the data descriptive statistics mean+S.D were used. In all the above statistical tools the probability value 0.05 was considered as significant level.

RESULTS :

Sex		
Female	119	79.33
Male	31	20.67
Total	150	100
Age Distribution		
Upto 20 Year	19	12.67
21 - 40 Years	71	47.33
41 - 60 Years	60	40.00
Total	150	100
Mean+SD	35.73+11.55	
Area		
Rural	110	73.33
Urban	40	26.67
Total	150	100
Duration of Surgery		
Upto 45 min	121	80.67
46 and above	29	19.33
Total	150	100.00
Mean+SD	36.94+11.13	
Duration of Post Operative Stay		
Upto 3 days	108	72.00
More than 3 days	42	28.00
Total	150	100
Mean+SD	2.49+0.75	

	Mean	SD
CRP Level		
Upto 22	15.01	11.4
> 22	15.62	10.13
Total Leucocyte Count		
Simple	7184	1630
Difficult	7939	2146
CBD Diameter		
Simple	2.77	0.68
Difficult	6.34	1.04
GB Wall Thick		
Simple	2.6	0.75
Difficult	4.82	0.89

	Number	Percent	Mean	SD
Laparoscopic cholecystectomy				
Simple	121	80.67	32.44	4.42
Difficult	29	19.33	56.12	11.4
Grading				
I (0-11)	76	50.67		
II (12- 22)	38	25.33		
III (23 -34)	19	12.67		
IV (35-40)	17	11.33		

DISCUSSION :

This prospective and hospital based study was conducted among 150 selected patients with laparoscopic cholecystectomy with special reference to CRP level and difficult dissection in the Department of General Surgery, JLN Medical College & Associated Group of Hospitals, Ajmer. The study was carried out with a view to evaluate the role of blood CRP level as a predictor of difficult laparoscopic cholecystectomy or its conversion based on intra operative findings.

This study has demonstrated that CRP testing is a common practice in pre-operative assessment of elective general surgery patients, and that the majority of patients also have CRP measured postoperatively. Age of 150 patients ranged from 20 to 60 years. Most of the patients 71 (47.33%) were between 21-40 years; with mean age of 35.73+11.55 years. The commonest age group of patients in this study are compared with other studies.

Study	Mean age
Kausik B et al. (2018) ²	50.41 years
Present study	35.73 years

Among the study participants, 119 (79.33%) were females and 31 (20.67%) were males. The male to female ratio was 1: 3.8. So, females were the predominantly involved group.

Sex ratio compared with other studies

Study	Sex Ratio (M:F)
Kausik B et al. (2018) ²	1:4.28
Present study	1 : 3.8

In this study 108 (72%) patients their duration of post operative stay was higher than in 42 (28%) patients with more than 3 days. The mean duration in simple laparoscopic cholecystectomy was 2.49+0.75 days and in difficult laparoscopic cholecystectomy it was . In the studies conducted by Kaushik B et al. (2018)² and et al also revealed mean duration of post operative stay ie. in Simple 2.1+0.6 days and in difficult 3.4+1.9 days.

In the present study simple laparoscopic cholecystectomy was found in 121 (80.67%) patients with mean value of 32.44+4.42 and difficult in 29 (19.33%) patients with mean value of 56.12+11.4. In the study of Mustafa FM et al (2022)⁶ out of 150 analysed patients [124 laparoscopic, 22 difficult laparoscopic cholecystectomy and 4 Conversion to open]. All patients had a recorded CRP.

This study has demonstrated that CRP testing is a common practice in pre-operative assessment of elective general surgery patients, and that the majority of patients also have CRP measured postoperatively. Mean CRP level upto 22 was 15.01+11.4 and >22 was 15.62+10.13. In the study of Kausik B et al. (2018)² mean CRP level upto 22 was 22.2+18.2 and >22 was 46.5+32.

Three parameters were assessed to predict the difficult LC. These parameters were: 1) total leucocyte count; 2) CBD diameter and 3) gall

bladder wall thickness. The mean value of these parameters were TLC - Simple : 7184+1630, difficult - 7939+2146, CBD diameter - Simple : 2.77+0.68, difficult - 6.34+1.04 and GB wall thickness : Simple : 2.6+0.75, difficult - 4.82+0.89.

CONCLUSION:

C Reactive protein can be potent predictor of difficult laparoscopic cholecystectomy and high CRP level have higher chances of intra operative complications or conversion to open.

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