

# Comparative Analysis of Serum Renal Profile in Gallstone Patients Undergoing Laparoscopic Cholecystectomy at a Tertiary Care Teaching Hospital

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## ABSTRACT

**Background:** Laparoscopic cholecystectomy (LC) gained wide acceptance as treatment of choice for gallstone disease and cholecystitis. The present study was planned for assessing the renal profile in gallstone patients undergoing LC.

**Materials & Methods:** A total of 50 gallstone patients scheduled to undergo LC were included in the present study. Preoperatively, blood samples were obtained from all the patients for assessment of serum renal profile. All the patients underwent laparoscopic cholecystectomy (LC) under the hands of skilled and experienced surgeon. Postoperative blood samples were obtained at 72 hours postoperatively. All the blood samples were sent to central laboratory for serum analysis. All the results were recorded and were analysed by SPSS software.

**Results:** Non-significant results were obtained while comparing the mean renal profile in patients undergoing LC. In the present study, raised postoperative blood urea levels were found in 16 percent of the patients, while raised serum creatinine levels were found in 22 percent of the patients.

**Conclusion:** Alteration in renal profile might occur in patients undergoing LC.

**Key words:** Laparoscopic Cholecystectomy, Renal Profile.

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## INTRODUCTION

Laparoscopic cholecystectomy (LC) gained wide acceptance as treatment of choice for gallstone disease and cholecystitis. With this new technique, not only did the new era of minimal invasive surgery begin, but also the spectrum of complications changed.<sup>1</sup> Surgeons should be proficient in a variety of dissection techniques, such as pulling techniques, gentle spreading with forceps, hook cautery, blunt dissection with a nonactivated spatula cautery tip or suction tube, temporal fixation by anchored pledgets, and reliable hemostasis by rubbing a bleeding point using a button-type pole with suction.<sup>2-4</sup> Current laparoscopic instruments are well developed, but each instrument should be used in the correct manner. Creation of pneumoperitoneum is primary to LC, where pressure is build up in abdominal cavity. It leads to significant hemodynamic derangements, whereas monitoring of pressure is not very efficient and accurate. CO<sub>2</sub> used gets dry and not humid which leads to drying of epithelium and causes epithelial damage of peritoneum. When extensive it

may result in cellular damage to epithelium putting large amount of cytokines in system was supposed to be incriminating factor in renal damage. Role of passing current of the cautery, which is extensively used in LC, through the organs it passes and role of burning smoke being reabsorbed over the surfaces is the another grey area as a cause of deranged renal function.

Among other techniques for the assessment of abdominal injuries, biochemical testing of organ enzymes is a common clinical practice.<sup>5</sup> The present study was planned for assessing the renal profile in gallstone patients undergoing LC.

## MATERIALS & METHODS

The present study was conducted in the Department of Surgery, Rama Medical College Hospital & Research Centre, Hapur, Uttar Pradesh (India) and it included comparison of serum renal profile in gallstone patients undergoing LC. A total of 50 gallstone patients scheduled to undergo LC were included in the

present study. Ethical approval was obtained from institutional ethical committee and written consent was obtained after explaining in detail the entire research protocol.

#### Inclusion Criteria

- Patients with presence of symptomatic Cholelithiasis,
- Patients with negative history of any other systemic illness,
- Patients with negative history of any known drug allergy,
- Patients with negative history of diabetes and hypertension

Preoperatively, blood samples were obtained from all the patients for assessment of serum renal profile. All the patients underwent laparoscopic cholecystectomy (LC) under the hands of skilled and experienced surgeons.

Postoperative blood samples were obtained at 72 hours postoperatively. All the blood samples were sent to central laboratory for serum analysis. All the results were recorded and were analysed by SPSS software.

**Table 1: Demographic data**

Parameter		Number of patients	Percentage
Age group (years)	Less than 30	7	14
	30 to 40	12	24
	41 to 50	14	28
	51 to 60	12	24
	More than 60	5	10
Gender	Males	20	40
	Females	30	60

**Table 2: Mean renal profile**

Renal profile	Preoperative	One week postoperative	p- value
Blood urea levels (mg/dL)	15.5	17.1	0.55
Serum creatinine (mg/dL)	0.95	1.05	0.18

**Table 3: Number of patients with raised postoperative renal profile**

Raised renal profile	Number of patients	Percentage of patients
Raised blood urea levels	8	16
Raised serum creatinine levels	11	22

## RESULTS

In the present, a total of 50 subjects scheduled to undergo LC were included in the present study. Mean age of the patients of the present study was 44.8 years. 28 percent of the patients belonged to the age group of 41 to 50 years. 24 percent of patients belonged to the age group of 30 to 40 years and 51 to 60 years. 14 percent of the patients belonged to the age group of less than 30 years. 60 percent of the patients in the present study were females while the remaining 40 percent were males. Mean preoperative blood urea levels among patients were found to be 15.5 mg/dL while mean postoperative blood urea levels was found to be 17.1 mg/dL.

Mean preoperative serum creatinine levels among patients were found to be 15.5 mg/dL while mean postoperative serum creatinine levels was found to be 17.1 mg/dL. Non-significant results were obtained while comparing the mean renal profile in patients undergoing LC. In the present study, raised postoperative blood urea levels were found in 16 percent of the patients, while raised serum creatinine levels were found in 22 percent of the patients.

## DISCUSSION

Gallstones represent a significant burden for health care systems worldwide and are one of the most common disorders presenting to emergency room. It was once considered a disease of western

world but due to changes in food pattern, now it is becoming an increasingly common cause of morbidity, leading to hospital admission in the developing world. It is one of the most common disorders of gastrointestinal tract, affecting 10% people in western society.<sup>6,7</sup>

In the present, a total of 50 subjects scheduled to undergo LC were included in the present study. Mean age of the patients of the present study was 44.8 years. 28 percent of the patients belonged to the age group of 41 to 50 years. 24 percent of patients belonged to the age group of 30 to 40 years and 51 to 60 years. 14 percent of the patients belonged to the age group of less than 30 years. 60 percent of the patients in the present study were females while the remaining 40 percent were males. The development of acute renal failure following laparoscopy has been reported previously, both in patients with a history of chronic kidney disease and in patients who have later required renal replacement therapy. Renal failure is thought to be secondary to the pneumoperitoneum, which is essential to the laparoscopic technique but also has a profound effect on the patient's cardiovascular, respiratory, neuro-endocrine and metabolic systems. Reduced urinary output intraoperatively has been widely reported, largely owing to reduced renal tissue perfusion secondary to an increased intra-abdominal pressure (IAP) produced by central venous compression. 4-8 IAP causes renal

vasoconstriction leading to urinary sodium retention and temporary tubular renal dysfunction. These changes in IAP are often well tolerated in healthy patients. However, it has been suggested that increased operative time as well as higher IAP increases the risk of developing cardiovascular complications postoperatively.<sup>8-10</sup>

In the present study, mean preoperative blood urea levels among patients were found to be 15.5 mg/dL while mean postoperative blood urea levels was found to be 17.1 mg/dL. Mean preoperative serum creatinine levels among patients were found to be 15.5 mg/dL while mean postoperative serum creatinine levels was found to be 17.1 mg/dL. Non-significant results were obtained while comparing the mean renal profile in patients undergoing LC. In the present study, raised postoperative blood urea levels were found in 16 percent of the patients, while raised serum creatinine levels were found in 22 percent of the patients. Aslam HM et al evaluated the relationship of ultrasonographic findings, hemolytic indices and liver function tests with gallstones. Total two tests were performed on each patient after diagnosis by ultrasonography. These were complete blood count and liver function tests. All the demographic data, laboratory findings and ultrasonographic features were noted in a pre-structured Performa. There were 120(26.4%) males and 334(73.6%) females, with a mean age of 42.80 ± 12.26 years. Most of the suspects had multiple stones 384 (84.5%) while few had single stones 70(15.4%). Fatty liver was found to be present in 144(31.7%) patients and 92(20.2%) had hepatomegaly. Splenomegaly was present in 16(3.5%) patients. Alkaline phosphatase was elevated in 186(41.0%) patients while SGPT was found to be raised in 160(35.2%). Blood urea nitrogen was found to be elevated in 186(41%) patients and serum creatinine was elevated in 46(10.1%) patients. In the light of findings it is recommend that all patients should go through the process of ultrasonography and all the biochemical parameters should be analyzed before surgery. Principal finding of their study was the massive increment in blood urea nitrogen and it was increased in approximately 42% patients. Literature concerning the relationship between gallstones and blood urea nitrogen is scarce and it was the first research which indicates the positive and significant relationship.<sup>11</sup>

Although non-significant results were found in this study but since it is an early study, certainly it gives a glimpse into a grossly disturbed internal ecosystem that is meliu interior of the body. Fortunately it is short lived and recover fast. A few unexplained post-operative disasters are enough to put these results into significance. When seen with a big picture in mind.

A larger study at a later date shall be conducted at this centre to make methods more clear. Further researches will be necessary to figure out a better understanding of this relationship.

## CONCLUSION

Under the light of above obtained data, the authors conclude that alteration in renal profile might occur in patients undergoing LC.

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