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MILD TO MODERATE ACUTE GALLSTONE PANCREATITIS: A COMPARATIVE STUDY OF EARLY VERSUS DELAYED CHOLECYSTECTOMY

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ABSTRACT

Background: About 75% of cases of acute pancreatitis in affluent countries are caused by gallstones. The biliopancreatic system's persistent obstructions, which cause the pancreas to gradually inflame, are the main cause of acute gallstone-induced pancreatitis. After an acute gallstone-induced pancreatitis episode, there may be recurrent pancreatitis episodes, common bile duct blockage, acute cholangitis episodes, or sporadic episodes of controllable biliary colic. Cholecystectomy is delayed until the local problems are treated, when severe pancreatitis with consequences such as pancreatic necrosis and organ failure are noted. The goal of early cholecystectomy is to reduce the risk of recurrent severe acute gallstone-induced pancreatitis, which is associated with serious health problems and an increased death rate. On the other hand, because early cholecystectomy is linked to a greater likelihood of complications and mortality, many surgeons often favour delayed cholecystectomy.

Objective: Examine the differences between patients receiving early versus delayed cholecystectomy for mild to moderate acute gallstone-induced pancreatitis (AGP) in terms of surgical duration, perioperative complications, conversion rate, length of hospital stay, and recurrence of gallstone-related disorders.

Study design: A Randomized controlled trial

Place and Duration: This study was conducted in Peoples University of Medical and Health Sciences Nawabshah from September 2022 to September 2023

Methodology: The participants of this study were aged 18 years and older. All of the patients were presented to the Department of General Surgery. All of the participants were diagnosed with mild-to-moderate AGP. Random sampling was used to place patients into two groups: early cholecystectomy (EC) and late cholecystectomy (LC). On a premade form, data on preoperative, intraoperative, and postoperative progress was gathered. Fisher's exact test was used to compare data with dichotomous variables that were reported as percentages. A P-value of less than 0.05 was seen as significant.
Results: A total of 100 patients were selected for this study because they met the inclusion criteria for this research. All of the individuals were diagnosed with acute gallstone-induced pancreatitis. The average age was 45.1 years. The age of the participants ranged from 18 to 75 years, respectively. Patients were divided into 2 groups: the EC (Early cholecystectomy) group and the DC (Delayed cholecystectomy) group, with each having 50 patients. The number of recurrent biliary events was 0 in the EC group, while it was 15 in the DC group.
Conclusion: The most effective method of treatment for AGP is a laparoscopic early cholecystectomy, which is safe and practical after the acute period.

Keywords: laparoscopic early cholecystectomy, acute gallstone-induced pancreatitis, adults, prognosis

INTRODUCTION

Gallstones are the root cause of about 75% of acute pancreatitis cases in developed nations. The biliopancreatic system's persistent obstructions, which cause the pancreas to gradually inflame, are the main cause of acute gallstone pancreatitis [1, 2]. After an acute gallstone pancreatitis episode, there may be recurrent pancreatitis episodes, common bile duct blockage, acute cholangitis episodes, or sporadic episodes of controllable biliary colic [3, 4]. The main strategy for stopping additional biliary problems is to have a cholecystectomy and have the biliary tract cleared [5]. About 10–20% of individuals have severe pancreatitis, which is associated with serious health problems and a high risk of death [6]. The majority of acute gallstone pancreatitis episodes are minor and go away on their own.

Cholecystectomy is delayed until the local problems are treated, when severe pancreatitis with consequences such as pancreatic necrosis and organ failure are noted. Endoscopic sphincterotomy (ES) and endoscopic retrograde cholangiopancreatography (ERCP) are two procedures that may be appropriate for patients with severe pancreatitis [7]. Nonetheless, laparoscopic cholecystectomy continues to be the recommended course of treatment for mild to moderate acute pancreatitis.

The International Association of Pancreatology (IAP) recommends that all patients have a cholecystectomy after recovering from an acute bout of AGP [8]. During the first hospital stay, the American College of Gastroenterology recommends cholecystectomy [9]. However, according to the British Society of Gastroenterology and the American Gastroenterological Association, cholecystectomy should be performed either during the initial hospital admission or within two weeks of discharge, with a strict limit of 2-4 weeks after hospital discharge in any case [10].

The goal of early cholecystectomy is to reduce the risk of recurrent severe AGP, which is associated with serious health problems and an increased death rate [11]. On the other hand, because early cholecystectomy is linked to a greater likelihood of complications and mortality, many surgeons often favour delayed cholecystectomy.

Patients with EC have a considerable chance of requiring an open cholecystectomy (OS) because acute inflammation can cause structural deformities in the perihepatic region [12]. This may make the procedure take longer to complete and increase the chance of problems, which could result in longer hospital admissions. This study compares people who have an early or delayed cholecystectomy after a mild to moderate episode of acute AGP in terms of the length of the procedure, the rate of conversion, the rate of perioperative complications, the length of hospital stay, and the rate of recurring problems related to gallstones.

METHODOLOGY

The Ethical Review Committee approved this randomized controlled trial. The participants in this study were aged 18 years and older. All of the patients were presented to the Department of General Surgery. All of the participants were diagnosed with mild to moderate AGP. The patients were briefed about the research, and their informed written consent was obtained.

Exclusion criteria: Patients with pancreatic necrosis, inflammation surrounding the pancreas, persistently high deranged liver function test results, and patients with pleural effusion on chest imaging were excluded from the study.

Random sampling was used to place patients into two groups: Early cholecystectomy (EC) and late cholecystectomy (LC). When a patient experienced certain symptoms, such as upper abdominal pain, nausea, vomiting, and discomfort in the upper abdomen, they were diagnosed with acute gallstone-induced pancreatitis (AGP). Additionally, they had to show that their serum levels of lipase and amylase had significantly increased as well as that ultrasonography had detected gallstones. Ranson's score (RS) of less than three for mild cases and between three and six for moderate cases were used to classify pancreatitis severity. Furthermore, no indication of organ failure or pancreatic tissue necrosis should show up on abdominal imaging.

The gallbladder was removed from patients assigned to the Early Cholecystectomy (EC) group during the initial hospital admission, whereas the procedure was performed on patients in the Delayed Cholecystectomy (DC) group four weeks after the patients were discharged from the hospital. Cholecystectomy by laparoscopy was performed on both groups. All patients had an intravenous second-generation cephalosporin administered prior to surgery when anaesthesia was induced. All patients underwent the same surgical procedures, whether they were laparoscopic or open. While laparoscopic operations employed a standard four-port method, open cholecystectomy needed a standard right subcostal incision. All postoperative patients received six months of follow-up care at the hospital's outpatient department after being discharged.

On a premade form, data on preoperative, intraoperative, and postoperative progress was gathered. The length of the procedure, the conversion rate, the length of the hospital stay, the perioperative problems, and the rate of recurring gallstone-related complications were all examined in the data. With SPSS version 26, statistical analysis was carried out. Fisher's exact test was used to compare data with dichotomous variables that were reported as percentages. A P-value of less than 0.05 was seen as significant.

RESULTS

A total of 100 patients were selected for this study because they met the inclusion criteria for this research. All of the individuals were diagnosed with acute gallstone-induced pancreatitis. The average age was 45.1 years. The age of the participants ranged from 18 to 75 years, respectively. Patients were divided into 2 groups; EC (Early cholecystectomy) group and DC (Delayed cholecystectomy) group. The individuals from both groups had no difference in terms of gender, age, and ethnicity. The number of patients in each group are shown in Table number 1.

Table No. 1: The number of patients in each group

Gender	EC Group	DC Group
● **Male**	25	25
● **Female**	25	25
Total	50	50

Table number 2 shows the pre-operative and post-operative results in both the groups.

Table No. 2: pre-operative and post-operative results in both the groups

Outcomes	EC Group (n=50)	DC Group (50)
Pre-operative problems (n)	9	4
Average duration of surgery (minutes)	55	40
Conversion to open surgery (n)	5	3
Post-operative problems (n)	4	3
Post-operative hospital stay (days)	2+0.5	2+1.5
Mortality (n)	0	0
Recurrent biliary events (n)	0	15

Table number 3 briefs about the recurrent biliary events after DC.

Table No. 3: recurrent biliary events after DC.

	DC Group (n=50)	Re-admission (n=15)
No. of recurrent biliary events	15	9
Acute cholecystitis	5	5
Biliary colic	6	0
Recurrent biliary pancreatitis	4	4

DISCUSSION

The standard procedure for removing the gallbladder is laparoscopic cholecystectomy (LC), which is also well known for its ability to successfully treat acute cholecystitis [13]. Gallstones can block the ampulla of Vater temporarily or over time, which is the main cause of acute gallstone pancreatitis (AGP) [14]. AGP typically goes away on its own, but in severe cases, it can cause serious health problems. The gallbladder must be removed in order to treat AGP, and the common bile duct must be examined and cleared if necessary (CBD). Gallbladder removal is delayed in severe AGP cases until local and systemic problems resolve [15]. There is disagreement over the best time to undergo a cholecystectomy in patients with mild to moderate AGP.

Early cholecystectomy (EC) procedures provide full therapy during a single hospital stay. Proponents of delayed cholecystectomy (DC) contend that acute pancreatitis causes anatomical changes that make laparoscopic cholecystectomy difficult to perform during the initial hospital stay [16]. This could result in more surgical complications and an increased risk of switching to open surgery. However, studies have indicated that DC has no appreciable effect in terms of complications prior to or following surgery or the length of hospital stays following the procedure and actually increases the recurrence rate of gallstone-related problems [17, 18].

This study found that the Early Cholecystectomy (EC) group had a greater rate of biliary problems and a higher conversion rate to open surgery than the Delayed Cholecystectomy (DC) group. Nevertheless, there was no statistically significant difference observed. This difference was statistically significant, with patients in the DC group experiencing more readmissions as a result of future biliary complications, which resulted in more health problems and longer hospital stays. Furthermore, there was a chance that individuals would not be followed up with once their hospital stay ends and their acute symptoms have subsided. Acute gallstone pancreatitis is known to have a recurrence rate of 31% to 60% if treatment is not received [19]. Early laparoscopic cholecystectomy is therefore thought to be safe and advised as a course of treatment. The lengths of the postoperative hospital stays and the operating times were comparable for both groups.

When comparing the morbidity associated with Delayed cholecystectomy (DC) with the surgical complication rate in a specialized hospital setting, early cholecystectomy (EC) demonstrated superior results [20]. Although perioperative problems were more common in patients with mild pancreatitis, most of these cases were easily managed, and the majority of patients had a straightforward hospital stay. There were no postoperative issues that necessitated a hospital

readmission due to their severity. In contrast, when an acute incident of AGP has resolved, there is a chance of hospital readmissions because of recurrent biliary problems. Although no deaths were reported in this trial, pancreatitis has a risk of both systemic and local consequences that could result in health issues and even death.

CONCLUSION

The most effective method of treatment for AGP is a laparoscopic early cholecystectomy, which is safe and practical after the acute period. While early cholecystectomy patients are more likely to convert to open surgery, delayed cholecystectomy patients are more likely to experience recurrent biliary issues and hospital readmissions, which increases morbidity and hospital costs.

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