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Comparison of Early Vs Late Cholecystectomy Performed for Mild Gall Stone Pancreatitis in Terms of Mean Length of Hospital Stay

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1. Abstract

1.1. Introduction

Pancreatitis is an inflammatory process in which pancreatic enzymes auto digest the gland. The gland sometimes heals without any impairment of function or any morphologic changes; this process is known as acute pancreatitis. Pancreatitis can also recur intermittently, contributing to the functional and morphologic loss of the gland; recurrent attacks are referred to as chronic pancreatitis. Both forms of pancreatitis may present in the Emergency Department (ED) with acute clinical findings. Recognizing patients with severe acute pancreatitis as soon as possible is critical for achieving optimal outcomes (see Presentation). Once a working diagnosis of acute pancreatitis is reached, laboratory tests are obtained to support the clinical impression, to help define the etiology, and to look for complications. Diagnostic imaging is unnecessary in most cases but may be obtained when the diagnosis is in doubt, when severe pancreatitis is present, or when a given imaging study might provide specific information needed to answer a clinical question. Image-guided aspiration may be useful. Genetic testing may be considered.

1.2. Objective

To compare of early vs late cholecystectomy performed for gall stone pancreatitis in terms of mean length of hospital stay

1.3. Setting

This study was carried out in department of Surgery, Hayatabad Medical Complex, Peshawar.

1.4. Duration of Study

This study was for 8 months of duration and was carried out after approval of the synopsis.

1.5. Study Design: Randomized control trial

1.6. Materials and Methods

This study was conducted in the in the Department of surgery, Hayatabad Medical Complex Peshawar (from 15th September 2014 to 15th May 2015). Through a randomized control Study Design, a total of 60 patients presenting with mild acute pancreatitis were included in the study in a consecutive manner and subjected to early or late cholecystectomy and then the length of hospital stay after the surgery was measured in days.

1.7. Results

The mean age of the patients of the group 1 was 43.27 years and that of the group 2 was 42.87 years. With regards to gender, there were 22 females and 8 males in group 1 making a percentage of 73.3 and 26.7 respectively. In group 2, 16 patients were females while 14 were males giving a percentage of 53.3 and 46.6 respectively. The mean length of hospital stays for group 1 was 4.63 days and for group 2 was 3.80 days. For females of group 1 the mean length of hospital stay was 4.68 days and for males was 4 days. For the females of group 2, the mean length of hospital stay was 4 days and for males was 3.57 days

1.8. Conclusion

Length of hospital stay is longer in early cholecystectomy as compared to late cholecystectomy but is statistically no significant.

2. Introduction

Acute pancreatitis is a complex inflammatory process involving the pancreatic gland. Acute pancreatitis is a nonbacterial inflammation of the pancreatic gland caused by activation and digestion of gland by its own enzymes [2]. Gallstones is the most common cause of acute pancreatitis worldwide1. Although most patients recover uneventfully, a subgroup goes on to develop severe complications [1]. Numerous scoring systems, including those of Ransomed al and Imrie et al have been devised in an effort to predict which patients will manifest severe Pancreatitis [1]. According to Ali AA and his fellows gall stones accounts for 54% of acute pancreatitis [2]. Over 70% of cases of acute pancreatitis in the UK are caused by alcohol or gallstones [2]. The frequency of gall stone pancreatitis was found to be 53.3% at Mayo Hospital Lahore in a study conducted by M Asifi and his Fellows [2]. In Peshawar, prevalence of gall stone pancreatitis was found to be 84% and 16% in females and males respectively with a mean age of 39 years [1]. The treatment for gall stone pancreatitis is cholecystectomy that may be carried out during the same admission [3, 7] or after an interval of 6 weeks [3]. Interval cholecystectomy was preferred in the past because it was thought that the time given for the acute episode to settle down would allow the surgeon to perform the surgery more easily, but it had the risk of development of recurrent attacks and complications especially cholangitis during the interval period [3]. In study conducted in Holland, it was found that 9.6% of patients who were supposed to undergo interval cholecystectomy after an attack of acute pancreatitis developed a recurrent attack of acute pancreatitis during the interval between first attack and cholecystectomy [4] researches in the west have proved that mild acute pancreatitis may be treated by cholecystectomy during the same admission and the comparison between interval and early cholecystectomy in terms of surgery related complications could not find out a significant difference in terms of operative complications, conversion rate, and mortality [3, 4, 6] Cholecystectomy should be delayed only in patients with severe acute pancreatitis who have signs of lung injury or systemic disturbance, in whom surgery should be planned when such signs have resolved [5].

However, the researchers have so far failed to develop a consensus among them regarding the length of hospital stay. A Swiss study showed that no significant difference existed between early and late cholecystectomy regarding the length of hospital stay [3]. Similar results were shown in a Pakistani study showing a hospital stay of 4.3 days for early and 3.1 days for delayed groups [3]. However, a study in Sweden showed that the length of hospital stay in early group was slightly longer i.e. 7 days (5-8 days) as compared to delayed group i.e. 4 days (3-6 days) [8].

The rationale of our study is based upon the diversity of data in literature regarding the length of the hospital stay in early and late cholecystectomy after gall stone pancreatitis. We want to find out that whether any difference exists in the length of hospital stay or not and if it does exist whether it is significant or not.

3. Objective

To compare early vs late cholecystectomy performed for gall stone pancreatitis in terms of mean length of hospital stay.

3.1. Operational Definitions

Mild acute pancreatitis- Mild acute pancreatitis was defined as a patient with acute pancreatitis presenting with anyone of the following;

- A Ranson score < 3 on admission or
- CRP of less than 240 on 4th day or
- CRP of less than 120 on 7th

Length of hospital stay was measured from the date of operation till the date of discharge. From this, the mean length of hospital stay was calculated as the average number of days that the average person stays in hospital for cholecystectomy performed for mild acute pancreatitis.

3.2. Hypothesis

There is a difference in the mean length of hospital stay between early and late cholecystectomy performed for mild acute pancreatitis.

4. Material and Methods

This study was carried out at Department of Surgery, Hayatabad Medical Complex, Peshawar. The duration of the study was 9 months (15th September 2014 to 15th May 2015). It was a randomized control trial. The sample size was 60 patients with 30 patients in each group.

4.1. Sampling Technique

Consecutive non-probability sampling

4.2. Inclusion Criteria

- All patients with mild acute pancreatitis as defined in the operational definition.
- Patients aged 16-60 years of age.
- Patients of either gender.

4.3. Exclusion Criteria

- Pancreatitis in a patient with other co morbidities like CVS disorders, renal disorders, hepatic disorders making him an ASA more than 2.
- Patient who has undergone any abdominal surgery previously.
- Patient who underwent any other concomitant surgery during the same setting like bile duct exploration, pancreaticojejunostomy.

5. Data Collection Procedure

This study was conducted after the approval by the hospital ethical committee. Eligible candidates were selected from the out-patient department and emergency referrals after screening through the inclusion and exclusion criteria. Informed written consent was obtained from the patients before their enrolment in the study. Examination and appropriate investigations as indicated were done to rule out moderate and severe cases. All the investigations were performed in the same laboratory using the same protocols to avoid any bias. Patients were randomly allocated into two groups i.e. group A and group B using coin flip technique. Early cholecystectomy i.e. cholecystectomy done within the same admission for acute pancreatitis was performed on group A and late cholecystectomy i.e. cholecystectomy performed six weeks after the resolution of acute pancreatitis was performed on group B. For each patient in both groups, the length of hospital stay was calculated from the date of surgery to the date of discharge and mean length was calculated for each procedure in each individual.

6. Data Analysis

Data was analyzed by statistical software SPSS version 10. Categorical variable like sex were presented by frequencies and percentages whereas Numerical variable like age and length of hospital stay were presented as mean and Standard Deviation. Independent T-test was applied to compare the mean length of hospital stay between the two groups considering the p value less than 0.05 as significant. Outcome variable i.e. mean length of hospital stay was stratified among the age and gender to see the effect modification. All the results were organized in tabulated form and are presented on appropriate charts and graphs.

7. Results

The study comprised a total of 60 patients diagnosed with mild acute pancreatitis secondary to gall stones and had been advised cholecystectomy for treatment. The patients were randomly allocated into two groups with 30 patients in each group; group 1 who underwent early cholecystectomy and group 2 who underwent late cholecystectomy. The mean age of the patients of the group 1 was 43.27 years and that of the group 2 was 42.87 years (Table 1).

With regards to gender, there were 22 females and 8 males in group 1 making a percentage of 73.3 and 26.7 respectively (Table 2). In group 2, 16 patients were females while 14 were males giving a percentage of 53.3 and 46.6 respectively (Table 2).

The mean length of hospital stay for group 1 was 4.63 days and for group 2 was 3.80 days. For females of group 1 the mean length of hospital stay was 4.68 days and for males was 4 days. For the females of group 2, the mean length of hospital stay was 4 days and for males was 3.57 days. The p value came out to be <.001 and was significant disproving our hypothesis that there is a difference in the length of hospital stay among the two groups.

Table 1: Age Distribution (n=60)

Age	Group A (n=30)	Group B (n=30)	Total
20-30 years	3(10%)	3(10%)	6
31- 40 years	7(23%)	5(17%)	12
41-50 years	9(30%)	13(43%)	22
51-60 years	11(37%)	9(30%)	20
Total	30	30	60
Mean & SD	43.27 ± 10.831	42.87 ± 10.458	

Chi Square test was applied in which P value was 0.973

Group A: Early Cholecystectomy
Group B: Late Cholecystectomy

Table 2: Gender Distribution (n=60)

GENDER	Group A (n=30)	Group B (n=30)	Total
Male	8(27%)	14(47%)	22
Female	22(73%)	16(53%)	38
Total	30	30	60

Chi Square test was applied in which P value was 0.751

Group A: Early Cholecystectomy
Group B: Late Cholecystectomy

Table 3: Mean Length of Hospital Stay (n=60)

Age	Group A (n=30)	Group B (n=30)	Total
3-4 days	24(80%)	27(90%)	43
4-5 days	6(20%)	3(10%)	17
Total	30	30	60
Mean & SD	4.63 ± 0.490	3.8 ± 0.407	

Student T Test was applied to compare mean length of hospital stay in which P value was 0.047

Group A: Early Cholecystectomy
Group B: Late Cholecystectomy

Table 4: Stratification of Mean Length of Hospital Stay W.R.T AGE (20-30 years) (n=60)

GROUPS	MEAN LENGTH OF HOSPITAL STAY	P VALUE
Group A (n=30)	3 ± 2.02	0.62
Group B (n=30)	3 ± 1.67	

Group A: Early Cholecystectomy
Group B: Late Cholecystectomy

Table 5: Stratification of Mean Length of Hospital Stay W.R.T AGE (31-40 years) (n=60)

GROUPS	MEAN LENGTH OF HOSPITAL STAY	P VALUE
Group A (n=30)	3 ± 2.46	0.543
Group B (n=30)	3 ± 2.05	

Group A: Early Cholecystectomy
Group B: Late Cholecystectomy

8. Discussion

Cholecystectomy is the only definitive treatment for gall stone pancreatitis in patients who are fit to undergo the procedure [9, 14]. This fact has been supported by different studies over the recent years in different parts of the world specially focusing on the timing of surgery whether to perform it in the same admission or wait for the acute episode to resolve and then perform the operation. Over the years, guidelines for the management of mild acute pancreatitis in the UK suggest that a patient developing mild acute pancreatitis should have a definitive intervention in the form of either ERCP/ cholecystectomy during the same admission unless an alternative plan is devised for the next 2 weeks [6]. However, although there is a growing stress to follow these recommendations but the compliance to these recommendations is still lower than the expected level and different assessments and audits have shown that sometimes patients have to wait for a considerably longer period of time to get their cholecystectomy done resulting subsequent attacks of pancreatitis or other biliary events [15].

Interval cholecystectomy has been the preferred operation up till recently as it was backed by the concept that operating on a patient with an acute episode of acute pancreatitis had a higher risk of complications and hospital stay but the delay in definitive treatment was associated with the risk recurrent pancreatitis, obstructive jaundice and cholangitis while the patient would be waiting for his definitive treatment [3]. In study conducted in Holland, it was found that 9.6% of patients who were supposed to undergo interval cholecystectomy after an attack of acute pancreatitis developed a recurrent attack of acute pancreatitis during the interval between first attack and cholecystectomy [4]. Studies from Europe have recently supported the idea of the surgery during the same admission as the they couldn't find any significant difference in complications, conversion rates and mortality [3, 4, 6]. Cholecystectomy should be delayed only in patients with severe acute pancreatitis where the pancreatitis is associated with systemic disturbances like ARDS and AKI, and it is reasonable to delay the surgery in such patients until the acute episode resolves [5].

Our study showed that the mean length of hospital stays for patients undergoing early cholecystectomy was 4.63 days and for the patients undergoing late cholecystectomy was 3.80 days. For females of group 1 the mean length of hospital stay was 4.68 days and for males was 4 days. For the females of group 2, the mean length of hospital stay was 4 days and for males was 3.57 days. The p value came out to be<.001 i.e. it was less than 0.05 and is significant to disprove the research hypothesis which was an alternate hypothesis in this case.

These results were comparable to another local study that showed a mean stay of 4.3 days for the early and 3.1 for the latter group [3]. However, a Swiss study showed that no significant difference existed between early and late cholecystectomy regarding the length of hospital stay [3]. However, a study in Sweden showed that the length of hospital stay in early group was slightly longer i.e. 7 days (5-8 days) as compared to delayed group i.e. 4 days (3-6 days) [8]. this study in Sweden was carried out from 1988 to 2003 with 11636 patients enrolled in the study. But because the Swedish study was a high powered study it prompted us to check this parameter out.

9. Conclusion

Early cholecystectomy carried out for mild acute pancreatitis is beneficial in terms of low chances of recurrent biliary events and, although it carries a slightly higher hospital stay than for late cholecystectomy yet it is statistically no significant.

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