

ORIGINAL ARTICLE

Comparison of Frequency of Surgical Site Infection with or without Bile Spillage during Laparoscopic Cholecystectomy

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ABSTRACT

Aim: To compare the frequency of surgical site infection with or without bile spillage during Laparoscopic Cholecystectomy.

Methods: This randomized controlled trial was conducted at Department of Surgery, M. Islam Medical and Dental College Gujranwala from March 2020 to September 2020 over the period of 6 months. Total 68 patients of acute cholecystitis (as per operational definition) undergoing laparoscopic cholecystectomy either male or female having age from 20-60 years with duration of gall stone (single or multiple) ≥ 6 months were selected. After 2 weeks follow-up, surgical site infection was assessed.

Results: Mean age of the patients was 39.90 ± 12.04 , mean age of patients of study group A was and B was 38.88 ± 13.01 and 40.91 ± 11.08 years respectively. Comparison of frequency of surgical site infection was done between both groups. In study group A (spillage group), SSI was found in 12 (35.29%) patients while in study group B (without spillage group), SSI was noted in 4 (11.76%) patients. Difference of frequency of SSI between the study group A and B was statistically significant ($P = 0.022$).

Conclusion: Results of present study showed that surgical site infection is mostly occurred in patients with spillage of bile during Laparoscopic Cholecystectomy. Most of the patients were belonged to 3rd and 4th decade of life. Significantly higher rate of surgical site infection was noted in female patients of spillage of bile group.

Keywords: Bile spillage, Laparoscopic Cholecystectomy, gall bladder, surgical site infection

INTRODUCTION

Cholecystectomy is the most common surgical procedure performed in surgical units. In 1989, gall bladder surgeries increased globally due to advent of laparoscopic cholecystectomy.¹ Many gallstones have no clinical symptoms, it diagnose during abdominal ultrasound for any other reason.² Gallstones had multi factorial etiology. Intake of high fat diet and high carbohydrate diet are the risk factors for the development of gallstones.³ For the management of inflammation of the gallbladder and gallstones, laparoscopic cholecystectomy (LC) replaced the open cholecystectomy.⁴ Small incision, shorter hospitalization and less post-operative pain are the main advantages of laparoscopy.⁵ Little data is available on surgical site infection (SSI) after LC.⁶ Very costly equipment are used in laparoscopy and these equipment are used for several years.⁷ Each sterilization and disinfection process have risk of acquiring micro-damages which may cause hepatitis B, C, HIV and several other infections.⁵ Indications for cholecystectomy are acute cholecystitis, acute and chronic cholecystitis. SSI's are the 3rd common most health care related infections which cause morbidity and mortality.⁷

In literature, there is scarcity of data on this topic. Results of this study may help us for early management of patients with bile spillage during laparoscopic cholecystectomy.

OPERATIONAL DEFINITION

Acute cholecystitis: "Acute cholecystitis based on three of the following signs; abdominal pain in the upper right quadrant, Murphy's sign, leukocytosis $>10000/\text{mm}^3$, and rectal temperature $>38^\circ\text{C}$ or $<36.5^\circ\text{C}$ as well as cholecystolithiasis (stones/sludge) or sonographic signs of cholecystitis (thickening and triple layer formation of the gall bladder wall)"

Surgical site infection: "Surgical site infection is defined as an infection of the skin and subcutaneous tissues which discharge the purulent material or is opened to drain the same by the surgeon."

MATERIAL AND METHODS

This randomized controlled trial was conducted at Department of Surgery, M. Islam Medical and Dental College Gujranwala from March 2020 to September 2020 over the period of 6 months.

Total 68 patients of acute cholecystitis (as per operational definition) undergoing laparoscopic cholecystectomy either male or female having age from 20-60 years with duration of gall stone (single or multiple) ≥ 6 months were selected.

Pregnant women, patients with jaundice at the time of diagnosis, ASA Grade-II patients, diabetic patients (on history), patients with history of bleeding disorder and patients with previous biliary surgery were excluded from the surgery.

Study was approved by ethical review committee. Written consent was taken from every patient. During routine laparoscopic cholecystectomy, we observed the patients for bile spillage occurred or not. If bile spillage

Received on 14-03-2021

Accepted on 02-06-2021

occurred, patient was entered in bile spillage group. If spillage not occurred, patients were entered in no spillage group. In this way we took 34 patients with bile spillage and 34 patients without spillage from routine laparoscopic cholecystectomy surgeries. After 2 weeks followup, surgical site infection was assessed and entered in pre-designed proforma. Demographic profile of all the patients was also noted.

The data was entered in SPSS V16 for statistical analysis. Quantitative variable like age was presented as mean \pm SD, while qualitative variable like gender, and surgical site infection (Yes/No) was presented in frequency and percentages. Chi-square test was applied to compare the frequency of surgical site infection in both groups. Stratification was done for age and gender. Post stratification chi-square test was applied to see the level of significance. P-values \leq 0.05 was considered statistically significant.

RESULTS

Mean age of the patients was 39.90 ± 12.04 , mean age of patients of study group A was and B was 38.88 ± 13.01 and 40.91 ± 11.08 years respectively.

Comparison of frequency of SSI was done between the both groups. In study group A (spillage group), SSI was found in 12 (35.29%) patients while in study group B (without spillage group), SSI was noted in 4 (11.76%) patients. Difference of frequency of SSI between the study group A and B was statistically significant ($P = 0.022$). (Table 1)

Patients of both groups were divided into two age groups i.e. age group 20-40 years and age group 41-60 years. In age group 20-40 years, out of 19 (55.88%) patients of study group A and 17 (50%) patients of study group B, SSI was found in 7 (36.84%) patients and 3 (17.65%) patients of study group A and B respectively. Difference of frequency of SSI between the both groups was not statistically significant ($P = 0.274$). In age group 41-60 years, out of 15 (44.12%) patients of study group A, SSI was found in 5 (33.33%) patients. While in study group B, out of 17 (50%) patients, SSI was noted in 1 (5.88%) patient. Difference of SSI between the both groups was statistically insignificant ($P = 0.076$). (Table 2)

Table 1: Comparison of frequency of surgical site infection between the both groups

Group	Surgical site infection		Total	P value
	Yes(%)	No(%)		
A (Spillage)	12 (35.29)	22 (64.71)	34	0.022
B (without spillage)	4 (11.76)	30 (40.54)	34	

Table 2: Comparison of frequency of surgical site infection between the both groups for different age groups

Group	Surgical site infection		Total	P value
	Yes(%)	No(%)		
Age group 20-40 years				
A(Spillage)	7 (36.84)	12 (63.16)	19 (55.88)	0.274
B(without spillage)	3 (17.65)	14 (82.35)	17 (50)	
Age group 41-60 years				
A(Spillage)	5 (33.33)	10 (66.67)	15 (44.12)	0.076
B(without spillage)	1 (5.88)	16 (94.12)	17 (50)	

Table 3: Comparison of frequency of surgical site infection between the both groups for gender

between the both groups for gender				
Group	Surgical site infection		Total	P value
	Yes(%)	No(%)		
Male patients				
A (Spillage)	4 (18.18)	18(81.82)	22(64.71)	0.665
B(without spillage)	2 (10)	18 (90)	20(58.82)	
Female patients				
A(Spillage)	8(66.67)	4 (33.33)	12(35.29)	0.014
B(without spillage)	2 (14.29)	12(85.71)	14(41.18)	

Among male patients of study group A and B, surgical site infection was noted in 4 (18.18%) patients and 2 (10%) patients respectively. But difference of frequency of SSI between the both groups was not significant ($P = 0.665$). Out of 12 (35.29%) female patients of study group A, SSI was found in 8 (66.67%) patients. While out of 14 (41.18%) female patients of study group B, SSI was found in 2 (14.29%) patients. Difference of frequency of SSI between the both groups was statistically significant ($P = 0.014$). (Table 3)

DISCUSSION

The objective of present study was to compare the frequency of SSI with or without bile spillage during Laparoscopic Cholecystectomy. Mean age of the patients was 39.90 ± 12.04 , mean age of patients of study group A was and B was 38.88 ± 13.01 and 40.91 ± 11.08 years respectively. Comparison of frequency of SSI was done between both groups. In study group A (spillage group), SSI was found in 12 (35.29%) patients while in study group B (without spillage group), SSI was noted in 4 (11.76%) patients. Difference of frequency of SSI between the study group A and B was statistically significant with p value 0.022. In one study by Al-Naser et al,⁸ frequency of SSI was 30% with spillage and 1.9% without bile spillage after Laparoscopic Cholecystectomy which is comparable with our study. Porwal et al reported an association between SSI and intra-operative spillage of bile during laparoscopic cholecystectomy.⁹ Peponis et al¹⁰ reported SSI in 7.1% patients with spillage of bile and in 2.4% patients without spillage of bile and the difference was statistically significant ($P = 0.001$). The SSI in patients with gall bladder content spillage was found to be statistically insignificant in study of Porwal et al.¹¹ In another study by Parajuli et al,¹² frequency of SSI was 12.1% in bile spillage group while 2.3% in without bile spillage group.

CONCLUSION

Results of present study showed that surgical site infection is mostly occurred in patients with spillage of bile during Laparoscopic Cholecystectomy. Most of the patients were belonged to 3rd and 4th decade of life. Significantly higher rate of surgical site infection was noted in female patients of spillage of bile group.

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