

A Comparative Study on Elective Laparoscopic Cholecystectomy with and Without Antibiotic Therapy

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Abstract

Objective: The present study was undertaken to evaluate the rate of infection in laparoscopic cholecystectomies, and to assess the usefulness and efficacy of antibiotic prophylaxis.

Methods: A comparative study of 394 cases of Cholelithiasis who underwent elective laparoscopy in the Rama Medical College Hospital and Research Center, Pilkhuwa, Hapur, Uttar Pradesh, during study period of January 2023 to May 2023. Patients were divided into study group and control group. All the patients were categorized into study and control groups.

Results: The mean age of the patients in the study group was 69.2 ± 4.3 years. In the control group 1 patient developed fever, in study group 7 patients (3.6%) developed pus discharge from port site, in which IV antibiotics were continued in the post-operative period till the time of discharge is calculated to be 3.6%. In study group 5 patients (2.5%) had pus discharge.

Conclusions: One single dose of prophylactic intravenous antibiotic, administered at induction of anesthesia, is sufficient to prevent postoperative infective complications in patient undergoing elective LAPC.

Keywords: Laparoscopic cholecystectomy, Antibiotic therapy, SSI, Prophylaxis.

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Introduction

Antibiotic prophylaxis can prevent infection in contaminated wounds but are clearly not indicated for most patients undergoing straightforward clean surgical operations in which no obvious bacterial contamination or insertion of a foreign body has occurred. [1] The infective complications of open cholecystectomy are well known, and prophylactic antibiotics are a routine practice. However, the wounds created after open cholecystectomy behave differently as compared to laparoscopic cholecystectomy. [2] First, the wounds created are smaller as compared to the open surgery. Secondly, it has been proved that the immune system is better preserved in laparoscopic surgery since the tissue trauma is less. [3,4] These results in lesser activation of the inflammatory response following the laparoscopic procedure. Furthermore, laparoscopic cholecystectomy per se does not violate the mucosal defense barrier of the respiratory, gastro-intestinal or genital epithelium. Observing the low incidence of infections following laparoscopic cholecystectomy, the need for antibiotics is now frequently

questioned. The over-use of antibiotics can result in a rising frequency of adverse effects, emergence of drug resistant organisms, as well as increased cost. It is not clear whether antibiotic prophylaxis in laparoscopic cholecystectomy is of any advantage to the patient in terms of preventing infection. Thus, the present study was undertaken to evaluate the rate of infection in laparoscopic cholecystectomies, and to assess the usefulness and efficacy of antibiotic prophylaxis in laparoscopic cholecystectomy. [5,-9]

Aim

To compare the impact of single dose of prophylactic intravenous antibiotic at induction of anesthesia alone with intravenous antibiotic therapy continued in the post-operative period in terms of post-operative infection related complication.

Objectives

1. To avoid unnecessary long post-operative antibiotic regimen.

2. To reduce the hospital cost hence we can improve the cost effectiveness.
3. To prevent antibiotic resistance.

Materials and Methods

The present study is a comparative study of 394 cases of Cholelithiasis who underwent laparoscopic cholecystectomy in the Rama Medical College Hospital and Research Center, Pilkhuwa, Hapur, Uttar Pradesh during study period of January 2023 to May 2023. These cases were selected based on inclusion criteria and were randomized using software after taking valid informed consent.

Inclusion Criteria

Adults > 18 years of age undergoing elective laparoscopic cholecystectomy for Cholelithiasis

Exclusion Criteria

1. Cholangitis
2. Acute cholecystitis
3. Lap converted open cholecystectomy
4. Recent onset acute cholecystitis

The general bio-data of patient regarding his name, age, sex, occupation, socio-economic status and address were collected. [10,11] A detailed history was taken with special reference to duration of abdominal pain (RUQ pain or epigastric pain), dyspepsia, indigestion, and its periodicity, its aggravation by fatty meals and relief by oral or parenteral analgesics. Any significant past history was also enquired. [12] A relevant general physical examination, abdominal and systemic examination was done. Pre-operative work up included a complete blood count, blood sugar, blood urea, serum creatinine, liver function tests, hepatitis

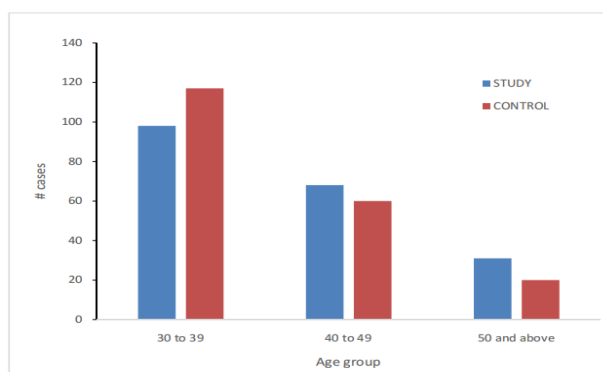
profile, X-ray chest and ultrasound of abdomen. Ultrasonogram was routinely performed on all patients to confirm the clinical diagnosis of cholelithiasis with number of calculus and size of calculus, gall- bladder wall thickness (>4mm was considered abnormal), pericholecystic collection. A routine pre-anaesthetic checkup was done. A fully explained well informed consent was taken. [13,14] A nasogastric tube was placed in all cases for gastric decompression to prevent trocar injury. All patients received prophylactic pre-op antibiotics (Inj. Cefotaxim 1gm IV). [15] The patients were operated by senior surgeons. [16] The operation was performed with standard four port technique, using carbon dioxide for peritoneal cavity insufflation. [17] The Veress technique was used to obtain pneumoperitoneum. Cystic artery and cystic duct were skeletonized and clamped with metallic clips separately. [18] Following gall bladder removal, No.24 ADK drain was placed in all cases. All patients had oral liquids followed by food from 3rd day after surgery, provided there was no nausea and vomiting. [19]

Results

A total of 394 patients eligible for the study were selected. All the patients who undergone elective laparoscopic cholecystectomy categorized into study group and control group. Study group receiving prophylactic intravenous antibiotic (1gm cefotaxim) at the time of induction of anesthesia alone. Control group receiving prophylactic intravenous antibiotic at the time of induction of anesthesia which will be continued in the post-operative period till discharge. Patients were followed in the post-operative period with regard to surgical site infections.

Age Incidence

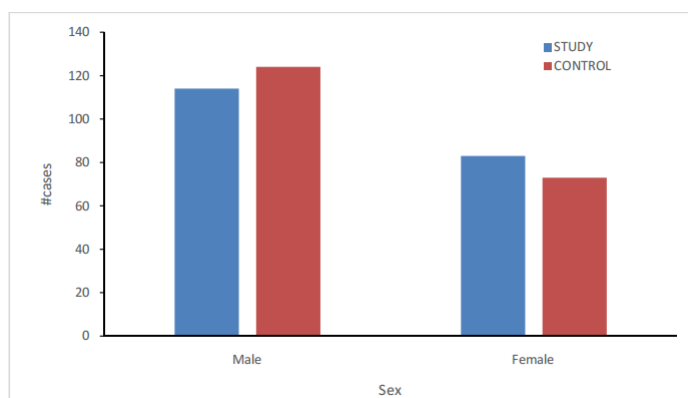
		Study group (N=197)		Control group (N=197)		p value
Characteristics		n	%	N	%	
AGE (in years)	30 to 39	98	49.7	117	59.4	p<0.05
	40 to 49	68	34.5	60	30.5	
	50 and above	31	15.7	20	10.2	



Mean age in the study group is 41 years, in the control group is 38 years, the age group of patients ranges from 30 to 58 years. In study group 49.7% of patients between 30 to 39 years of age. In control group 59.4% of patients from 30 to 39 years of age. Patients are allocated in the study and control without statistically significant.

Sex Distribution

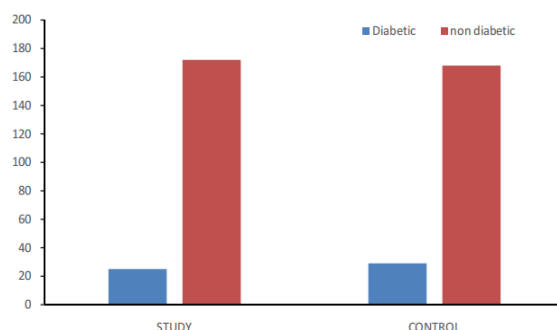
		STUDY (N=197)		CONTROL(N=197)		
Characteristics		n	%	n	%	p value
SEX	Male	114	57.9	124	62.9	p>0.05
	Female	83	42.1	73	37.1	



In the study group 114 cases (57.9%) are male and 83 cases (42.1%) are female. In the control group 124 cases (62.9%) are male and 73 cases (37.1%) are female.

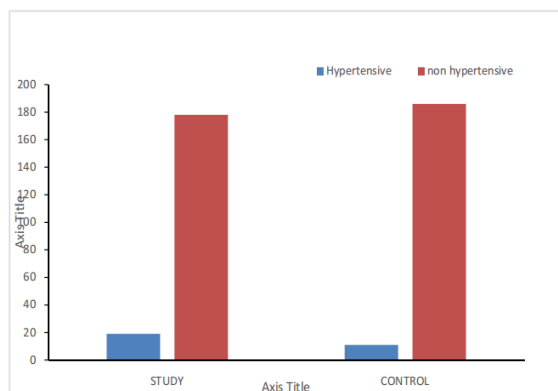
Comorbidities-Incidence:

		STUDY (N=197)		CONTROL(N=197)		
Characteristics		n	%	n	%	p value
DIABETES MELLITUS	Diabetic	25	12.7	29	14.7	p<0.05
	non diabetic	172	87.3	168	85.3	



In the study group 25 patients are diabetic in the control group 29 patients are diabetic. When analyzed statistically no significant association between the presence of diabetes and wound infection could be obtained.

		Single dose (N=197)		Multi dose (N=197)		
Characteristics		N	%	n	%	p value
Hypertension	Hypertensive	19	9.6	11	5.6	p>0.05
	non hypertensive	178	90.4	186	94.4	

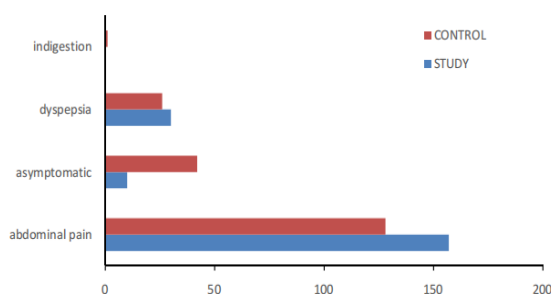


In the study group 19 patients are hypertensive which is 9.6%. In the control group 11 patients are hypertensive which is 5.6%. When analyzed statistically no significant association between the presence of hypertension and wound infection could be obtained.

Presenting Complaints Incidence

Most of the patients are presented with abdominal pain as a main complaint in both study and control group. 79.7% of patients in the study group 65% of patients in the control presented with abdominal pain. 5.1% of patients in the study group and 21.3% of patients in the control group are asymptomatic. 15.2% of patients in the study group, 13.2% of patients in the control group presented with dyspepsia.

		STUDY (N=197)		CONTROL (N=197)		
Characteristics		N	%	N	%	p value
presenting complaint	abdominal pain	157	79.7	128	65.0	p>0.05
	Asymptomatic	10	5.1	42	21.3	
	Dyspepsia	30	15.2	26	13.2	
	Indigestion	0	0.0	1	0.5	



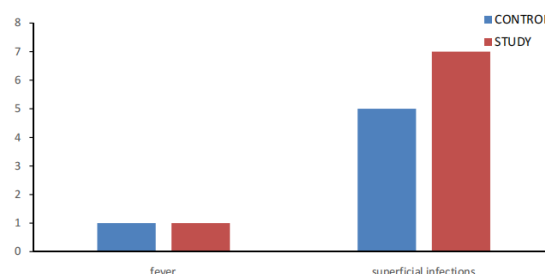
Post Operative Complications

Post-operative complications are monitored. In study group 1 patient developed fever, in the control group 1 patient developed fever. In this study surgical site infections were taken into account. In the study group 7 patients (3.6%) developed pus discharge from port site which is considered as superficial infections, in the control group 5 patients

(2.5%) developed pus discharge. In all cases deep infections are ruled out by doing ultrasonography. There is no seroma formation in both study and control group. I concluded that surgical site infection in the single IV antibiotic group is 3.6% where as in the control group, in which IV antibiotics were continued in the post-operative period till the time of discharge is calculated to be 2.5%.

		STUDY (N=197)		CONTROL (N=197)		
		N	%	N	%	
Complications	Developed	8	4.2	6	3.0	P<0.05
	not developed	190	95.8	191	97.0	

	STUDY(N=197)		CONTROL(N=197)	
complication	n	%	N	%
Fever	1	1.5	1	0.5
Superficial infections (pus discharge from port site)	7	3.6	5	2.5
deep infection	0	0	0	0
Seroma formation	0	0	0	0
Others	0	0	0	0



Conclusions

Based on the findings of our study, it may be concluded that post-operative antibiotics do not reduce post-operative infective complications after elective laparoscopic cholecystectomy for cholelithiasis. One single dose of prophylactic antibiotic, administered at induction of anesthesia, is sufficient to prevent post-operative infective complications in patient undergoing elective laparoscopic cholecystectomy.

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