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A Study On Laparoscopic Cholecystectomy With And Without Antimicrobial Therapy.

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ABSTRACT

Laparoscopic cholecystectomy has become the new gold standard for management of symptomatic gallstones. Prophylactic antibiotics are used in elective surgery by the majority of surgeons, and their role in biliary tract surgery has been well established for a subpopulation of high-risk patients. This consensus has been derived from multiple studies involving biliary tract surgery before and in the era of laparoscopic cholecystectomy. But the use of prophylactic antibiotics in laparoscopic cholecystectomy especially in the low-risk group is now controversial and varied among the surgeons all over the world. To compare the impact of single dose of prophylactic intravenous antibiotic at induction of anaesthesia alone with intravenous antibiotic continued in the post operative period in terms of post-operative infection related complication. The general bio-data of patient regarding his name, age, sex, occupation, socio-economic status and address was collected. A detailed history was taken with special reference to duration of abdominal pain (RUQ pain or epigastric pain), dyspepsia, indigestion, its periodicity, its aggravation by fatty meals and relief by oral or parenteral analgesics. Any significant past history was also enquired. A relevant general physical examination, abdominal and systemic examination was done. 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 are presented with dyspepsia. One single dose of prophylactic antibiotic, administered at induction of anaesthesia, is sufficient to prevent post operative infective complications in patient undergoing elective laparoscopic cholecystectomy

Keywords: Laparoscopic cholecystectomy, Preoperative antibiotics, Wound infection

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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 [2]. However, the wounds created after open cholecystectomy behave differently as compared to laparoscopic cholecystectomy. 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]. 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 [4].

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 [5].

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 [6].

METHODOLOGY

The present study is a comparative study of 394 cases of cholelithiasis who undergone laparoscopic cholecystectomy in the institute of general surgery, Government Mohan Kumaramanglam Medical College, Salem, Tamil Nadu, India during study period of may 2021 to October 2022.

Inclusion Criteria

Adults > 18 years of age undergoing elective laparoscopic cholecystectomy for cholelithiasis.

Exclusion Criteria

- Cholangitis
- Acute cholecystitis
- Lap converted open cholecystectomy
- Recent onset acute cholecystitis

The general bio-data of patient regarding his name, age, sex, occupation, socio-economic status and address was collected. A detailed history was taken with special reference to duration of abdominal pain (RUQ pain or epigastric pain), dyspepsia, indigestion, its periodicity, its aggravation by fatty meals and relief by oral or parenteral analgesics. Any significant past history was also enquired. 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. 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). The patients were operated by different senior surgeons. The operation was performed with standard four port technique, using carbon dioxide for peritoneal cavity insufflation. The Veress technique was used to obtain pneumoperitoneum. Cystic artery and cystic duct were skeletonized and clamped with metallic clips separately. Following gall bladder removal, No.16 romovac suction 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.

RESULTS

A total of 394 patients eligible for the study were selected. All the patients who undergone elective laparoscopic cholecystectomy categorised into study group and control group. Study group receiving prophylactic intravenous antibiotic (1gm cefotaxim) at the time of induction of anaesthesia alone. Control group receiving prophylactic intravenous antibiotic at the time of induction of anaesthesia 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.

Table 1: Age Incidence

		Study group (N=197)		Control group (N=197)		
Characteristics		n	%	N	%	p value
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	

Table 1 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. 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.

Table 2: Comorbidities Incidence Of DM

		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	

Table 2 In the study group 25 patients are diabetic in the control group 29 patients are diabetic. When analysed statistically no significant association between the presence of diabetes and wound infection could be obtained.

Table 3: Presenting Complaints Incidence

		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	

Table 3 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 are presented with dyspepsia.

Table 4: Post Operative Complications

		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	

Table 5

complication	Study(N=197)		Control(N=197)	
	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

Post operative complications are monitored. In study group 1 patient was 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 discharge is 2.5%.

DISCUSSION

It is well documented that prophylactic antibiotic coverage of most ‘clean contaminated’ surgical procedures can significantly prevent infectious complications, including wound infections, thereby affecting the overall mortality and morbidity [8]. However, the benefit of antibiotic prophylaxis in other ‘clean surgical procedures, such as laparoscopic cholecystectomy, has been questionable [9]. The low rate of wound infections and the straight forward treatment, if they occur at all, are the main arguments against routine antibiotic coverage during laparoscopic cholecystectomy. Laparoscopic cholecystectomy is an elective clean operation, and the post operative wound infections would be very low. Prophylaxis in clean operations has been shown to be of value in other areas of surgery such as trauma and vascular surgery but in laparoscopic cholecystectomy, its benefits remain uncertain. Due to the unknown impact on bacterial resistance, Waldvogel and associates suggested that the routine use of antibiotic prophylaxis should be discouraged [10]. The mean age of the study is 41 years in study group and 38 years in control group. The percentage of the females in the study group is 42.1% and in the control group is 37.1%. The percentage of males in the study group is 57.9% and, in the control, group is 62.9%. Symptomatic cholelithiasis is most commonly present in the 5th decade with significant female preponderance [11]. Pain abdomen is was the commonest presenting symptom which occurs 79.7% in the study group and 65% in the control group. In my study 12.7% of patients in study group and 14.7% of patients in the control group were diabetic and 9.6% of patients in the study group and 5.6% of patients in the control group were hypertensive [12]. There are several risk factors that are significantly associated with an increased incidence of infective complications in patients who undergo elective laparoscopic cholecystectomy, one of them is the presence of diabetic mellitus. Out of 197 patients in the study group 7 of them developed pus discharge from port site with incidence of about 3.6% and in the control group 5 patients out of 197 patients are developed pus discharge from port site with incidence of about 2.5%. All others had completely healed wound [13]. These differences yielded a P>0.05 which is statistically insignificant, thereby illustrating that the rates of wound infection in patients given only a single shot of iv antibiotic, and in patients given continuous post operative iv antibiotics is statistically insignificant. All the infections healed before the availability of culture and sensitivity report without any specific therapy [14]. Good surgical techniques and the judicious use of prophylactic antibiotics are two major factors for decreasing the incidence of septic complications after biliary tract surgery. They also concluded that the use of antibiotic prophylaxis is preferred to be restricted to high-risk patients such as patients with associated comorbidities like diabetes mellitus. The rate of post-operative wound infection in our study was low (0.41%) and there was no significant difference between wound infection in patients receiving prophylactic antibiotics and post-operative antibiotics [15]. Wound complications and its management - In our study, 1 patient in group A developed superficial wound infection at the umbilical port site. The wound was laid open, and a swab was taken for culture and antibiotic sensitivity. However, the swab revealed no growth of any micro-organisms after 48 hours of culture [16]. Daily dressings were done, and secondary suturing was performed once the wound was clean on the 3rd post-

operative day. This may be because the deep umbilical depression is sometimes difficult to clean. Also, it may be due to the routine protocol of our unit to extract the gall bladder through the umbilical port [17]. The presence of diabetes mellitus is a known risk factor for biliary sepsis. The altered motility of the common bile duct muscles, which is secondary to autonomic neuropathy observed in diabetic patients, as well as increased lipid concentration in bile, are the elements that can cause an increased susceptibility to biliary sepsis in patients with diabetes [18-20].

CONCLUSION

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 anaesthesia, is sufficient to prevent post operative infective complications in patient undergoing elective laparoscopic cholecystectomy.

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