FREQUENCY AND COMMON RISK FACTORS IN UMBILICAL PORT SITE INFECTION IN PATIENTS UNDERGOING ELECTIVE LAPAROSCOPIC CHOLECYSTECTOMY

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ABSTRACT

Introduction: Wound infection remains the major problem in surgical practice worldwide. Historically the wound infection can be disastrous in terms of morbidity and mortality just by ignoring the aseptic techniques. In less than three decades no other operation has been so profoundly affected by the advent of laparoscopy as cholecystectomy. A National Institute of Health [NIH] consensus statement in 1992 stated that "Laparoscopic cholecystectomy (LC) provides a safe and effective treatment of most patients with symptomatic Gall Stones and has become the treatment of choice for many patients.

Objective: To determine the frequency and common risk factors in umbilical port infection in patients undergoing elective Laparoscopic cholecystectomy.

Material and Methods: This study was conducted at Department of Surgery, Surgical B Unit, Khyber Teaching Hospital, Peshawar. Duration of the study was one year (23/03/2015 to 22/3/2016) in which a total of 166 patients were observed. All patients undergoing for elective laparoscopic cholecystectomy, Both gender, Age between 18- 60 and patients with Cholelithiasis with echogenic foci in the gallbladder on ultrasound were included. All the admitted patients underwent complete history taking and clinical examination, and baseline investigations as a part of pre-operative work-up was done. Patients were asked to stop oral intake after 12 midnight on the night of surgery. Third generation cephalosporin (cefoperazone plus sulbactam) was given to all patients at the time of induction of anesthesia. All patients were scrubbed with pyodine for 3 minutes, with special emphasis on umbilicus. Three to four ports were inserted according to surgeon's preference. All the technical aspects of the procedure were kept standardized amongst all patients. Patient wound was checked on day 5 after surgery and was asked for followup after five days for removal of stitches and the wound assessment for signs of infection in the form of local erythema, tenderness and discharge.

Results: In this study Mean age was 48 years with SD ± 18.66. Twenty six percent patients were male while 74% patients were female. Seventeen 10% patients had port site infection in which 14(82%) patients had BMI >30, 12(68%) patients had prolonged surgery > 200 minutes, 70% patients were operated by junior consultants and 13(75%) patients had acute cholecystitis.

Conclusion: Our study concludes that the incidence of umbilical port infection in patients undergoing elective Laparoscopic cholecystectomy was 17(10%) and the main risk factors were obesity, prolonged surgical procedures, procedures done by junior consultants.

Key Words: Common risk factors, umbilical port infection, elective Laparoscopic cholecystectomy.

INTRODUCTION

Wound infection remains the major problem in surgical practice worldwide. Historically the wound infection can be disastrous in terms of morbidity and mortality just by ignoring the aseptic techniques[1].

In less than three decades no other operation has been so profoundly affected by the advent of laparoscopy as cholecystectomy. A National Institute of Health [NIH] consensus statement in1992 stated that "Laparoscopic cholecystectomy (LC) provides a safe and effective treatment of most patients with symptomatic Gall Stones and has become the treatment of choice for many patients[2]

Waqar Alam Jan et al Out of 294 cases, 17 (5.78%) developed PSI. Out of these 17 infected cases 12 (70.5%) had superficial infection while 5 (29.4%) had deep surgical site infection (SSI). Epigastric port-site was infected in 15 (88.2%) cases followed by the umbilical port-site in 2 (11.8%) cases. Two (11.8%) patients with port-site infection had operation lasting < 1 hour while in 15 (88.2%) cases the surgery lasted for >1hr. Main operative findings were acute cholecystitis in 7 (41.1%) patients, empyema gall bladder in 4 (23.5%), adhesions in 3 (17.6%).[1]the overall incidence was 5.07%,Rooh-ul-Muqim et al4.84%[3]Romy S et al 1.7%[4], Chen LF et al0.3%[5],SomuKarthik et al 1.8%[6]. Various risk factors involved in development of PSI are,

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obesity (12.3%)[7],longer surgery time of more then 150 mins (25%)[6 7 8],level of surgeon(junior surgeon)(77.8%)[8], sequence on list[9], and acute cholecystitis (25.9%)[10]

The Rationale of our study is to determine frequency of common risk factors of umbilical port infection in patients undergoing elective laparoscopic cholecystectomy. It is extremely important that the risk factors predisposing the patients to port-site infection are identified, as not only does this deprive the patient from most of the benefits that LC offers but is also an extra financial burden in an era of rapidly developing drug resistant forms of bacteria.. And avoidance of the frequently responsible risk factors will lead to better surgical practice, improved patient care and provide us with fresh local descriptive statistics of the risk factors about umbilical port infection. In other words, the study data will be helpful to decrease the general disease burden of infection, as well as reduce the morbidity associated with umbilical port infections.

OBJECTIVE

To determine the frequency and common risk factors in umbilical port infection in patients undergoing elective Laparoscopic cholecystectomy.

MATERIAL AND METHODS

This study was conducted at Department of Surgery, Surgical "B" Unit, Khyber Teaching Hospital, Peshawar. Study design was descriptive cross sectional study and duration of the study was one year (23/03/2015 to 22/3/2016) in which a total of 166 patients were observed by taking proportion 12.3% of obesity as a risk factor.[7] Margin of error 5% and confidence level 95% using WHO Calculator. More over consecutive non-probability sampling technique. All patients undergoing for elective laparoscopic cholecystectomy, Both gender, Age between 18- 60 and patients with Cholelithiasis with echogenic foci in the gallbladder on ultrasound were included while Patients on steroids, Patients with chronic diabetes mellitus with duration of diabetes of 3 years or more as detected by medical records and history of empyema Gall bladder were excluded. After approval from hospital ethical and research committee. All patients meeting the inclusion criteria admitted from OPD were included in the study. An informed written consent was obtained from the patient after explaining the pros and cons of the study. All the admitted patients underwent complete history taking and clinical examination, and baseline investigations as a part of pre-operative work-up was done. Patients were asked to stop oral intake after 12 midnight on the night of surgery. Third generation cephalosporin (cefoperazone plus sulbactam) was given to all patients at the time of induction of anesthesia. All patients were scrubbed with pyodine for 3 minutes, with special emphasis on umbilicus. Three to four ports were inserted according to surgeon's preference. All the technical aspects of the procedure were kept standardized amongst all patients. Patient wound was checked on day 5 after surgery and was asked for followup after five days for removal of stitches and the wound assessment for signs of infection in the form of local erythema, tenderness and discharge. Patients' demographic data and risk factors and findings on follow-up visit were recorded in the proforma. Data was collected and analyzed in SPSS v17.0. Mean ± SD was calculated for numerical variables like age, BMI and duration of surgery. Percentage and frequencies were analyzed for categorical variables like gender, Port site infection and common risk factors (BMI, Prolonged surgery time, level of surgeon, operative finding like acute cholecystitis).Common risk factors were stratified among age, gender, BMI and duration of surgery to see effect modifiers. Post stratification was done through Chi square test keeping P value less than or equal was considered significant. All results were presented in the form of tables and graphs.

RESULTS

In this study age distribution among 166 patients were analyzed as 18(11%) patients were in age range 18-30 years, 53(32%) patients were in age range 31-40 years, 58(35%) patients were in age range 41-50 years, 37(22%) patients were in age range 51-60 years. Mean age was 48 years with SD ± 18.66. (table no 1). Forty three (26%) patients were male while 123(74%) patients were female. (table no 2). Seventeen (10%) patients had port site infection while 149(90%) patients didn't had port site infection. (table no 3). Common risk factors of port site infection among 17 patients were analyzed as 14(82%) patients had BMI >30, 12(68%) patients had prolonged surgery > 200 minutes, 70% patients were operated by junior consultants and 13(75%) patients had acute cholecytitis. (table no 4). Stratification of

Table No 1. Age Distribution

AGE	FREQUENCY	PERCENTAGE
18-30 years	18	11%
31-40 years	53	32%
41-50 years	58	35%
51-60 years	37	22%
Total	166	100%

Mean age was 48 years with SD ± 18.66
Mean BMI was 31 with SD ± 11.27
Mean duration of surgery was 204 minutes with SD ± 23.349

Table No 2. Gender Distribution

GENDER	FREQUENCY	PERCENTAGE
Male	43	26%
Female	123	74%
Total	166	100%

Table No 4. Common risk factors

COMMON RISK FACTORS		YES	NO
Obesity (BMI)	≤ 30	3	18%
	>30	14	82%
Total		17	100%
Prolong surgery	≤ 200 min	5	32%
	> 200 min	12	68%
Total		17	100%
Level of surgeon	Senior Consultant	5	30%
	Junior Consultant	12	70%
Total		17	100%
Acute cholecytitis	Yes	4	25%
	No	13	75%
Total		17	100%

Table No 5. Stratification of Common Risk Factors With Age (n=17)

COMMON RISK FACTORS		18-30 years	31-40 years	41-50 years	51-60 years	Total	P value
Obesity (BMI)	≤ 30	3	0	0	0	3	0.0007
	>30	0	5	5	4	14	
Total		3	5	5	4	17	
Prolong surgery	≤ 200 min	3	2	0	0	5	0.0105
	> 200 min	0	3	5	4	12	
Total		3	5	5	4	17	
Level of surgeon	Senior Consultant	0	1	2	2	5	0.7565
	Junior Consultant	2	3	4	3	12	
Total		2	4	6	5	17	
Acute cholecytitis	Yes	0	2	2	0	4	0.5709
	no	0	5	5	3	13	
Total			7	7	3	17	

common risk factors of port site infection with age and gender is given in table no 5,6

DISCUSSION

Wound infection remains the major problem in surgical practice worldwide. Historically the wound infection can be disastrous in terms of morbidity and mortality just by ignoring the aseptic techniques[1]. In less than three decades no other operation has been so profoundly affected by the advent of laparoscopy as cholecystectomy. A National Institute of Health [NIH] consensus statement in1992 stated that "Laparoscopic cholecystectomy (LC) provides a safe and effective treatment of most patients with symptomatic Gall Stones and has become the treatment of choice for many patients[2]

In this study Mean age was 48 years with SD ± 18.66. Twenty six percent patients were male while 74% patients were female. Seventeen 10% patients had port site infection in which 14(82%) patients had BMI >30, 12(68%) patients had prolonged surgery > 200 minutes, 70% patients were operated by junior consultants and 13(75%) patients had acute cholecytitis.

Similar results were found by Waqar Alam Jan et al Out of 294 cases, 17 (5.78%) developed PSI. Out of these 17 infected cases 12 (70.5%) had superficial infection while 5 (29.4%) had deep surgical site infection (SSI). Epigastric port-site was infected in 15 (88.2%) cases followed by the umbilical port-site in 2 (11.8%)

Table No 6. Stratification o Common Risk Factors With Gender (n=17)

COMMON RISK FACTORS		Male	Female	Total	P value
Obesity (BMI)	≤ 30	2	1	3	0.1186
	>30	3	11	14	
Total		5	12	17	
Prolong surgery	≤ 200 min	2	3	5	0.9492
	> 200 min	5	7	12	
Total		7	10	17	
Level of surgeon	Senior Consultant	2	3	5	0.7932
	Junior Consultant	4	8	12	
Total		6	11	17	
	Yes	2	2	4	0.8927
	no	6	7	13	
Total		8	9	17	

cases. Two (11.8%) patients with port-site infection had operation lasting < 1 hour while in 15 (88.2%) cases the surgery lasted for >1hr. Main operative findings were acute cholecystitis in 7 (41.1%) patients, empyema gall bladder in 4 (23.5%), adhesions in 3 (17.6%).[1]the overall incidence was 5.07%,Rooh-ul-Muqim et al4.84%[3]Romy S et al 1.7%[4], Chen LF et al0.3%[5],SomuKarthik et al 1.8%[6].Various risk factors involved in development of PSI are, obesity (12.3%)[7],longer surgery time of more then 150 mins (25%)[6 7 8],level of surgeon(junior surgeon) (77.8%)[8], sequence on list[9], and acute cholecystitis (25.9%)[10]

Similar results were found in another study conducted at Taj MN et al[11] in which a postoperative wound infection was found in 27 (5.48%) of 492 cases. Umbilical port infection was found in 26 (5.28%) of cases in which gall bladder was removed without endogloves and only one case (0.2%) had infection when gall bladder was removed with the endogloves. Wound infection was more in acute cholecystitis (25.9%) and empyema of Gall Bladder (44.4%). Among the co morbid conditions, diabetes mellitus has got higher frequency of wound infection (44%).

Similar results were found in another study conducted by Ashraf M, et al[12] in which the operating time was calculated from skin incision, for introduction of Veress needle to end of skin closure of puncture wounds. An average of 91 minutes (range from 45 to 134 minutes) was required for each operation. In none of our patient hospital discharge occurred on the day of surgery. Only seven patients were discharged 24 hours after the procedure. The average duration of hospital stay was 3 days (2 to 14 days). Conversion to a standard open cholecystectomy was necessary in 7 cases (5.9%). Reasons for conversion to open technique were: acutely inflamed edematous thick-walled gallbladder was difficult to grasp in 3 cases, in 1 bleeding from cystic artery, in 3 patients, poor visualization of the operative field due to technical difficulties with our camera. Sub-umbilical port site wound infection occurred in 4 (3.3%) patient, that was controlled with local dressings and antibiotics. None of the patient in the study had port site bleeding, Pulmonary Embolism (PE), Deep Venous Thrombosis (DVT) and port site hernia.

CONCLUSION

Our study concludes that the incidence of umbilical port infection in patients undergoing elective Laparoscopic cholecystectomy was 17(10%) and the main risk factors were obesity, prolong surgery procedures, procedures done by junior consultants.

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