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Original research article

FREQUENCY OF PORT SITE INFECTION IN PATIENTS UNDERGOING LAPAROSCOPIC CHOLECYSTECTOMY

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Abstract: *Laparoscopic cholecystectomy is a common surgical procedure for the treatment of gallstones. Although considered minimally invasive, port site infections (PSI) remain a concern, potentially impacting patient outcomes and recovery times. Understanding the frequency and risk factors associated with PSI is essential for improving surgical practices and patient safety.* ***Objective:*** *To assess the frequency of port site infection in patients undergoing laparoscopic cholecystectomy.* ***Methods:*** *A cross-sectional study was conducted in the surgery department from January 2, 2024, to April 2, 2024. The study enrolled 120 patients presenting for laparoscopic cholecystectomy. The mean age of the patients was 34.30 ± 9.57 years, and the mean BMI was 25.32 ± 2.21 kg/m². The frequency of PSI was determined, and its association with BMI was analysed using statistical methods, with a significance level set at $P < 0.05$.* ***Results:*** *The PSI frequency was 6.7% (8 out of 120 patients). There was a notable association between increasing BMI and the occurrence of PSI ($P = 0.005$).* ***Conclusion:*** *The frequency of PSI in patients undergoing laparoscopic cholecystectomy in this study was 6.7%, suggesting that the procedure is relatively safe for gallbladder removal. Higher BMI was significantly associated with an increased risk of PSI, indicating the need for targeted strategies to mitigate this risk in patients with elevated BMI.*

Keywords: Cholecystectomy, Gallstones, Laparoscopy, Port Site Infection, Risk Factors, Surgical Site Infection

Introduction

Laparoscopic surgery, a less invasive treatment, has become widely used in various medical specialties. Open cholecystectomy has always been seen as the standard treatment for gallstones. In 1987, a revolution in the treatment of gallstones began with the introduction of the first laparoscopic cholecystectomy. Currently, laparoscopic c cholecystectomy is widely recognised as a very effective method due to its ability to minimise pain, reduce hospitalisation time, lower the occurrence of complications, and expedite postoperative recoveries (1-3).

While Laparoscopic Cholecystectomy is considered superior to open Cholecystectomy, it is not without its own set of issues and is responsible for a range of minor to major complications (4). Complications linked with the surgical incision sites in laparoscopic Cholecystectomy may include bleeding occurring after the surgery or during the procedure, the spread of cancer to other parts of the body, a scar that causes pain, infection of the wound, hernia, and the accumulation of blood outside of blood vessels. Port-site bleeding may manifest as either a gradual discharge or more severe bleeding if a major blood vessel is damaged (5, 6).

Surgical site infections remain a significant concern even in modern times [(7)]. The categorisation of surgical site infections encompasses superficial infections, which affect the skin and subcutaneous tissue, and deep infections, which involve the fascia and muscle layer. Another classification is organ space infection. Infections can be classified as either intrinsic or extrinsic, depending on the type of microorganisms involved and the method of transmission (8).

Overlapping dressing or internal bleeding may be detected postoperatively (9). Port site infection is a frequently occurring complication, affecting approximately 5-6.3% of patients, as documented in the literature (10). Port site hernia refers to a type of incisional hernia that occurs at the location where a trocar or port was inserted during a laparoscopic surgical operation. A 10 mm distance is often observed at the port location, either within the umbilical, epigastric, or infra-umbilical region. Port-site hernia is rarely seen at the cannula site measuring 5 mm. The incidence of port-site hernia varies between 1%- 6% (11).

Laparoscopic cholecystectomy is an effective procedure used for gallstone removal adopted worldwide. The process is time-consuming and requires a more challenging learning process. Due to the lack of literature on this subject locally, this study aims to investigate the frequency of port-site wound infections in patients undergoing laparoscopic cholecystectomy at our health setup. This study aims to provide the most recent and accurate information. Furthermore, the findings of this study will be disseminated among other healthcare professionals and can be utilized for other research endeavours.

Methodology

This cross-sectional study was conducted at the Surgical Department from 02-01- 2024 to 02-04-24. This study was conducted after receiving ethical approval. All of the indicative gallstone patients presenting for laparoscopic cholecystectomy with an age greater than 18 years of either gender were included. Patients with hepatitis B and C, acute pancreatitis, and significant co-morbidities were prevented from participating in the study. All the patients had to go through clinical examination before the surgery. Surgeries were performed by an experienced surgeon having

experience of more than five years. A proforma was used to capture all of the information regarding the patient's demographic characteristics and PSI postoperative were recorded on a pro-forma.

SPSS 25 was utilized for assessing the variables in the study. A T-test was applied for association between PSI and BMI keeping the value of P significant at ≤ 0.05.

Results

One hundred twenty patients had a mean age of 34.30±9.57 years with an average BMI of 25.32±2.21 kg/m^2. Female patients had a higher frequency than male patients (Figure 1). Education we observed that 52 (43.3%) patients were literate while 68 (56.7%) were illiterate. Residence status showed that 47 (39.2%) belonged to the urban areas while 73 (60.8%) belonged to the rural areas. The most frequent symptom of cholecystectomy at presentation was abdominal pain 56 (46.7%) followed by vomiting 46 (38.3%) (Table 1). Frequency of PSI was observed 8 (6.7%) (Table 2). Patients with PSI exhibited higher BMI than patients who did not develop PSI (P = 0.005) (Table 3).

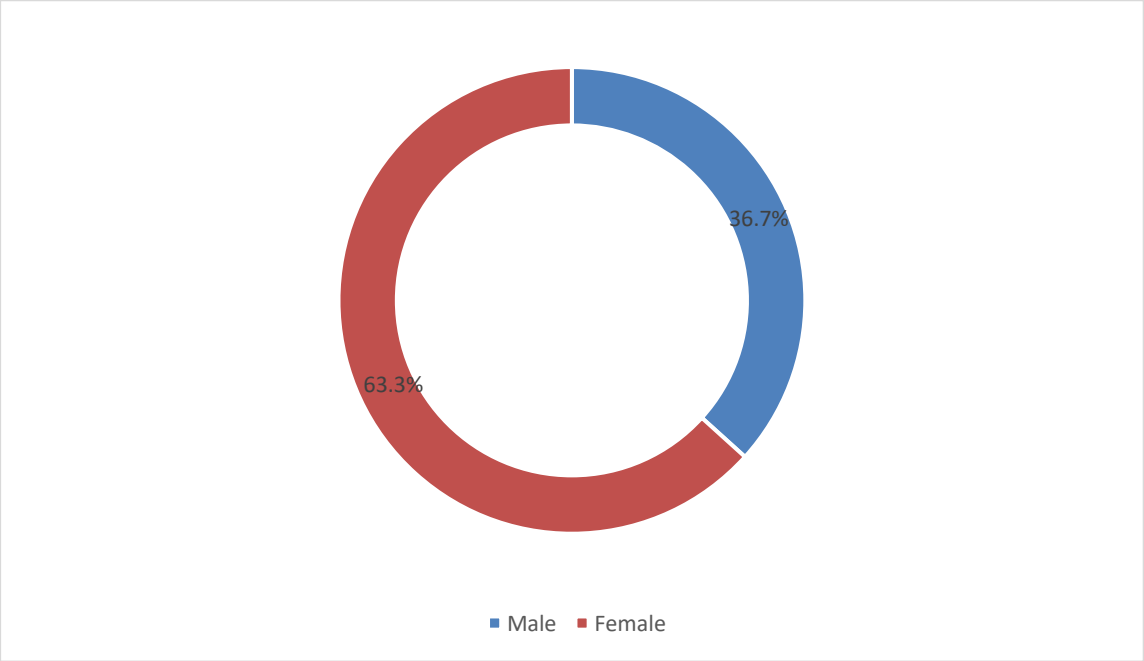

Figure 1 Gender distribution

Table 1 Clinical symptoms at presentation

Clinical symptoms at presentation	Frequency	Per cent
Abdominal pain	56	46.7
Vomiting	46	38.3
Fever	18	15.0
Total	120	100.0

Table 2 Frequency of PSI

Frequency of PSI	Frequency	Per cent
Yes	8	6.7
No	112	93.3
Total	120	100.0

Table 3 Association of PSI with BMI (Kg/m2)

PSI	N	Mean	Std. Deviation	P value
Yes	8	27.4250	.99361	0.005
No	112	25.1727	2.20596	

Discussion

Encountering port-site infections during laparoscopic surgery can be a disappointing consequence, even though they are quite uncommon. According to the Centers for Disease Control and Prevention (CDC), the majority of laparoscopic procedures that are performed fall into either the clean or clean-contaminated classifications of surgical wounds. Even though these surgical incisions are relatively clean, the rate of port-site infections that have been documented in the literature ranges from 1.4% to 6.3%. It's

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possible that the infection came from an endogenous or external source(12).

When proper preoperative bowel preparation is performed, as well as when spillage is contained after surgery, it is possible to limit the number of endogenous sources of infection. To do the latter, it is possible to reduce the number of injuries to the hollow viscus and to retrieve specimens using endobags. On the other hand, sedulous sterilization is a method that can be utilized to accomplish exogenous source reduction. Recent information reveals that the most common cause of post-sanctioning infections (PSIs) caused by non-tuberculous mycobacteria is a breakdown in the protocol concerning the sterilization process (13).

As a result of the fact that NTMs are found in nature in large quantities, especially in soil and running water, they can quickly contaminate medical tools. It has been observed that contamination with NTMs has primarily occurred following laparoscopic procedures. Two key variables could be responsible for this phenomenon. To begin, laparoscopic instruments contain a layer of insulation that restricts the application of autoclaving in their sterilizing process. As a consequence, the eradication of NTM endospores on these instruments is only partially successful. Second, laparoscopic devices include several joints and moving parts, which means that biological soil, burned tissue, and grime may build up on them. It is necessary to perform a thorough cleaning of the tools before they may be sent to be sterilized. One of the most common outcomes of inadequate cleaning procedures is the accumulation of endospores in surgical instruments. These endospores have the potential to be transmitted to patients during surgical procedures (14).

Our study included 120 patients presenting for laparoscopic cholecystectomy with a mean age of 34.30±9.57 years. We observed that the frequency of female patients turned out to be higher than that of male patients. A similar observation has been reported by a study which stated that the mean age of their patients was 37.33±12.12 years and gender-wise female patients were higher in number as compared to male patients [(15)].

Out of one hundred and twenty patients we found that PSI was observed in 8 (6.7%) patients, the aforementioned study reported 12% port site-related complications were reported in 12% of patients while PSI was reported in 6% of patients.[15] another study reported that the rate of PSI in their series was 8% which is similar to our observation (16).

We assessed the link between PSI and BMI, we found a notable association between PSI and BMI. Patients with PSI had higher BMI than those who did not develop PSI. A similar observation has been reported in a local study which demonstrated that patients with higher BMI had higher frequencies of PSI in their trial (17).

Conclusion

In conclusion, the frequency of PSI in our study was only 6.7% in patients undergoing laparoscopic cholecystectomy, which infers that laparoscopic cholecystectomy is a safe procedure for the removal of gallbladder.

Declarations

Data Availability statement

All data generated or analyzed during the study are included in the manuscript.

Ethics approval and consent to participate.

Approved by the department concerned. (IRB-MMC/2541-20-10-23)

Consent for publication

Approved

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Conflict of interest

The authors declared an absence of conflict of interest.

Authors Contribution

SHAHI FARIS (Trainee Medical Officer)
Concept, Drafting & Design of Study,
MUHAMMAD HUSSAIN SAFI (Professor)
Revisiting Critically, Data Analysis & Final Approval of version

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