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A Study of Early and Late Port Site Complications Following Laparoscopic Surgeries among Patients Admitted at Tertiary Care Hospital

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Abstract

Introduction: The term 'complication' is used to describe any departure from the normal postoperative expected course and the range of complications. Port site complications add to the morbidity of surgery and cause concern to both clinician and patient. Laparoscopic surgery, also known as minimally invasive surgery (MIS), is a type of surgery that is performed through small incisions in the abdomen or pelvis.

Aims and Objectives: To investigate the early and late port site complications following laparoscopic surgeries among patients admitted to a tertiary care hospital.

Primary objectives: To determine the early and late complications associated with ports after laparoscopic surgery.

Secondary objective: To identify the risk factors associated with the common port site complications after a laparoscopic surgery.

Material and Methods

Study Design: A Longitudinal study. (Follow-up)

Study Site: Surgery Department at a tertiary health care centre.

Study Population: This study consists of the patient admitted to the surgical ward at tertiary health care centre and undergoing laparoscopic surgeries at the institute.

Study Duration: The study will be conducted for 18 months (1st June 2023 – 31st June 2024).

Sample Size: For our availability and convenience of thesis purpose we took as 100 sample size for our study.

Sampling Method: The sample size is determined by complete enumeration method.

Result: The majority of the participants, 66%, are in the less than 30 years old age group. This is followed by the 31-40 years old age group, which has 19% of the participants. The 41-50 years old age group has 6% of the participants, and the over 50 years old age group has 9% of the participants.

Discussion: Laparoscopic surgeries are related with minimal port site complications. Port site infection is a rare complication of Laparoscopic surgery. The beginning of laparoscopy has reduced the rate of postoperative morbidity.

Keywords: Diabetes Mellitus, Hypertension, Laparoscopic Surgery, Pelvis, Visceral Injury.

Introduction

Laparoscopic surgeries are preferred over general surgeries because of lesser pain and scarring, faster convalescence, and lesser hospital stay, and besides these advantages complications are by far very rare. Common complications include infection, incisional hernia, bleeding, etc.

One of the complications associated with laparoscopic surgery is port site infection, which is responsible for a significant increase in morbidity, hospital stay, and financial loss. However, port site infection is preventable.

A vital component of safe effective laparoscopy is the ability to insert, secure, and maintain access ports in an optimal location while avoiding injury to intraperitoneal structures and visceral organs.

Laparoscopic surgery, also known as minimally invasive surgery (MIS), is a type of surgery that is performed through small incisions in the abdomen or pelvis. A laparoscope, a thin tube with a camera attached to the end, is inserted through one of the incisions to allow the surgeon to see inside the abdomen or pelvis.

The study of early and late port site complications following laparoscopic surgeries is essential for improving patient outcomes, enhancing patient safety, optimizing resource utilization, promoting quality improvement, and guiding future research in surgical care.

Aims and Objectives

To investigate the early and late port site complications following laparoscopic surgeries among patients admitted to a tertiary care hospital.

Objectives of the study

Primary objectives

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Study Duration: The study will be conducted for 18 months (1st June 2023 – 31st June 2024).

Sample Size: Concerning the study of Sharma D (46) et al (2013) of incidence of poet site infection was 9% in 1 year so prevalence = 9×1=9

Formula for sample size = n = 4pq/ l2

N= sample size

P = prevalence

Q= 1-p

Where p= 0.09 while q=1-= 1-0.09= 0.91

L= precision error= 6%=0.06

N= 4×0.09×0.91/ (0.06)2

N= 92

For our availability and convenience of thesis purpose we took as 100 sample size for our study.

Sampling Method

The sample size is determined by complete enumeration method.

Statistical Analysis

- Data will be recorded in a predesigned case record form and compiled in Microsoft Excel version 2018 and analysed.
- Descriptive statistics for quantitative variables will be represented as mean +/- SD.
- Qualitative variables will be represented as frequency and percentages.
- Fisher test or Chi-square test will be used to test the association of columns and rows in tabular data, in the case of qualitative, categorical data.
- Pearson or Spearman correlation will be done, depending on the normality of the distribution, to evaluate the correlation of any variables.
- Graphical representations will be done wherever applicable. The level of significance will be considered as $P < 0.05$.
- Data will be analysed using GraphPad Prism software version 3.06.

Selection Criteria of ANC Mothers

Inclusion criteria

- All patients undergoing various laparoscopic procedures in the department of surgery at tertiary health care centre.

Exclusion criteria

- Those cases which were converted to open procedures will be excluded from the study.
- Patients not willing to participate in the study.
- Withdrawal and dropout criteria:
  - Patients unwilling to give their consent.
  - Patients who initially gave their consent for the study but later did not continue follow-up.

Result

Table 1: Age-wise Distribution of study participants

Sn.	Age Groups	Frequency (N=100)	Percentage (%)
1	<30	066	66.0
2	31-40	019	19.0
3	41-50	006	6.0
4	>50	009	9.0
	Total	100	100.0

Table 1 show that most participants (66%) fall within the age group of under 30 years old. The remaining participants are relatively evenly distributed across the other three age groups, with 19% between 31 and 40 years old, 6% between 41 and 50 years old, and 9% over 50 years old. This suggests that the study sample is primarily composed of young adults.

Figure 1: Age-wise Distribution of study participants.

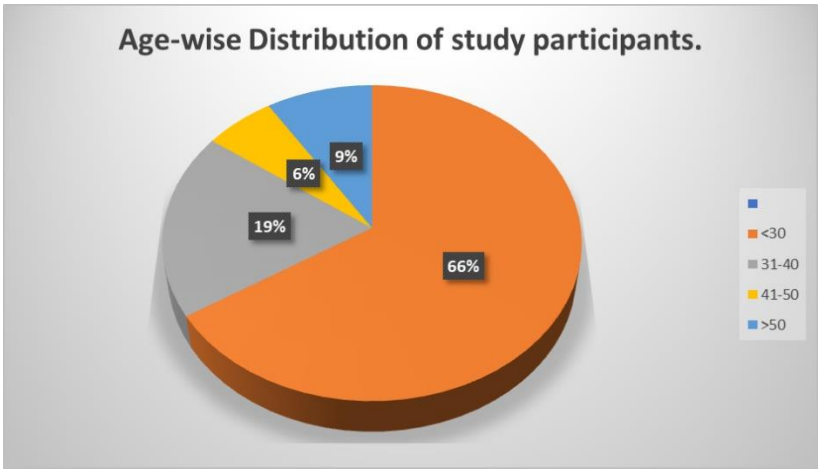

Table 2: Gender-wise Distribution of Study Participants.

Sn.	Gender	Frequency (N=100)	Percentage (%)
1	Male	051	51.0
2	Female	049	49.0
	Total	100	100.0

The table 02 shows the gender Distribution of the 100 study participants. There are an equal number of males and females in the study. This is a good representation of the general population, as there are approximately 51% males and 49% females

Figure 2: Gender-wise Distribution of Study Participants.

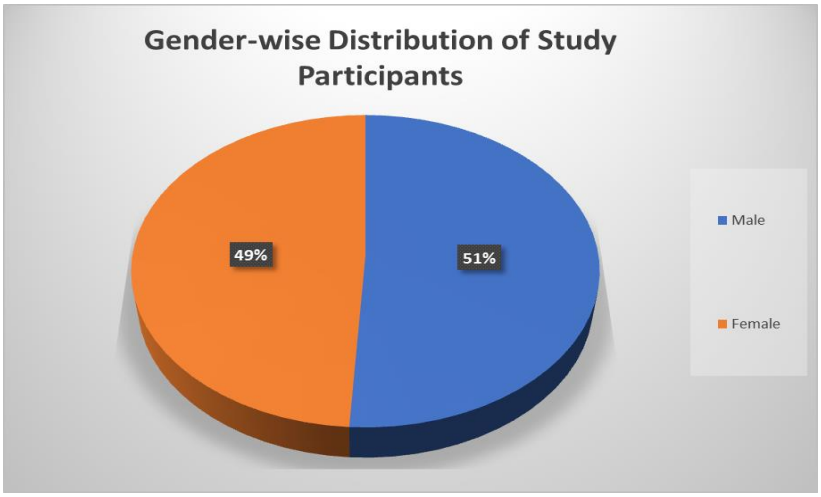

Table 3: Distribution of Study Participants with or without Diabetes mellitus

Sn.	Diabetes Mellitus	Frequency (N=100)	Percentage (%)
1	Present	024	24.0
2	Absent	076	76.0
	Total	100	100.0

The table shows the frequency and percentage of individuals with and without diabetes mellitus in a sample of 100 people. Out of the 100 individuals, 24 have diabetes mellitus (24%) and 76 do not (76%).

Figure 3: Distribution of Study Participants with or without Diabetes mellitus

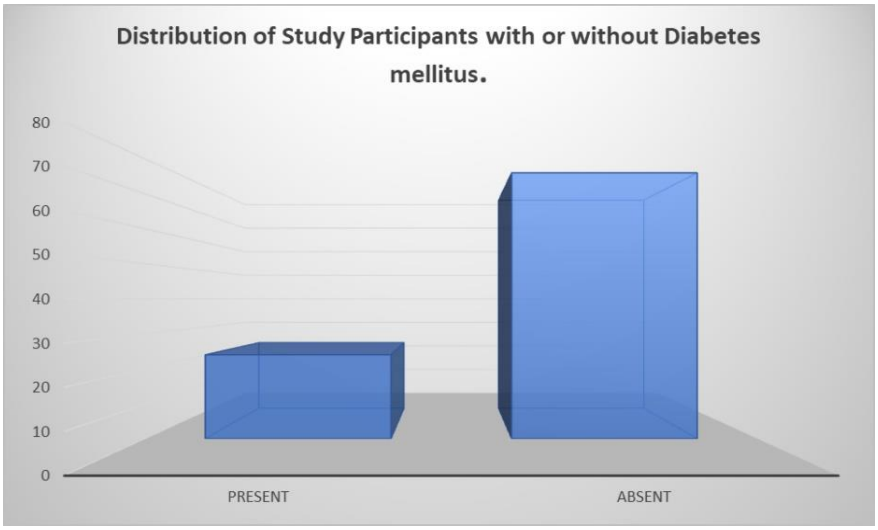

Table 4: Distribution of Study Participants with or without Hypertension

Sn.	Hypertension	Frequency (N=100)	Percentage (%)
1	Present	012	12.0
2	Absent	088	88.0
	Total	100	100.0

The Table presents the frequency and percentage Distribution of hypertension among 100 individuals. Out of the 100 individuals, 12 have hypertension (12%), while 88 (88%) do not. These findings suggest that hypertension is present in a significant portion of the population studied.

Figure 4: Distribution of Study Participants with or without Hypertension

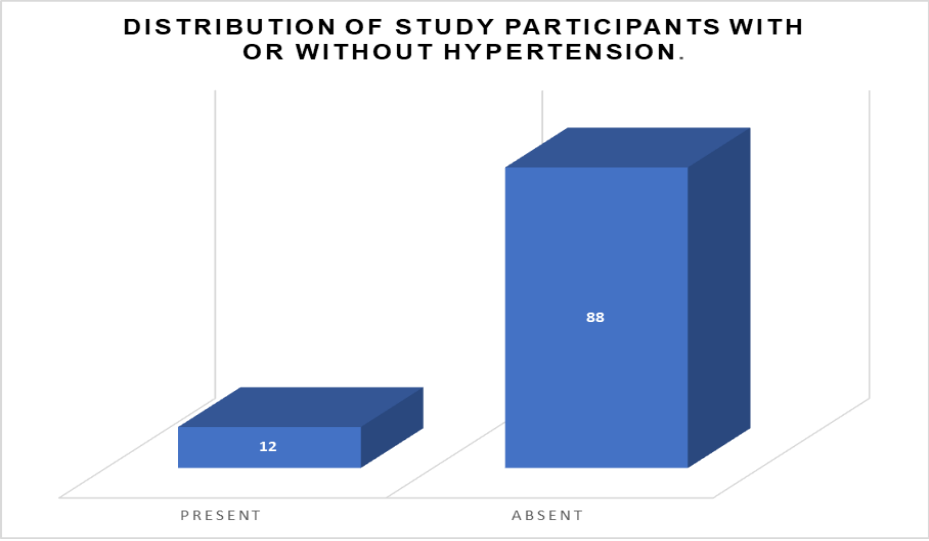

Table 5: ASA Grade-wise Distribution of Study Participants

Sn.	ASA Grade	Frequency (N=100)	Percentage (%)
1	ASA-1	075	75.0
2	ASA-2	025	25.0
	Total	100	100.0

The ASA GRADE table shows the frequency and percentage Distribution of ASA grades for 100 patients. Out of the 100 patients, 75 (75%) have ASA grade 1, and 25 (25%) have ASA grade 2. This suggests that the majority of patients have a low ASA grade, indicating a lower risk of complications during surgery.

Figure 5: ASA Grade-wise Distribution of Study Participants.

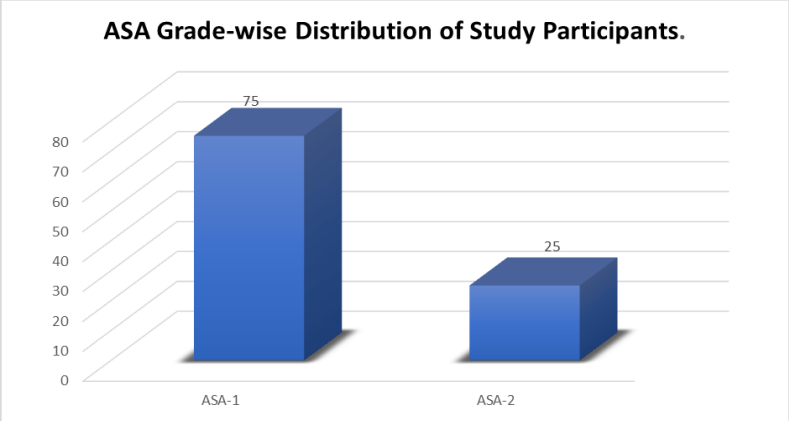

Table 6: Distribution of Study Participants with Visceral Injury

Visceral Injury	Frequency (N=100)	Percentage (%)
Yes	001	01.0
No	099	99.0
Total	100	100.0

The table presents the frequency and percentage of visceral injury in a sample of 100 people. Out of the 100 people, 1 (1.0%) had a visceral injury and 99 (99.0%) did not.

Figure 6: Distribution of Study Participants with Visceral Injury

Table 7: Surgical Site Infection (SSI)-wise Distribution of Study Participants

Sn.	Surgical Site Infection	Frequency (N=100)	Percentage (%)
1	Present	014	14.0
2	Absent	086	86.0
	Total	100	100.0

The table shows the frequency and percentage Distribution of surgical site infections (SSIs) for 100 individuals. Out of the 100 individuals, 14 (14%) have an SSI, and 86 (86%) do not. This suggests that the rate of SSIs in this population is relatively low.

Figure 7: Surgical Site Infection (SSI)-wise Distribution of Study Participants

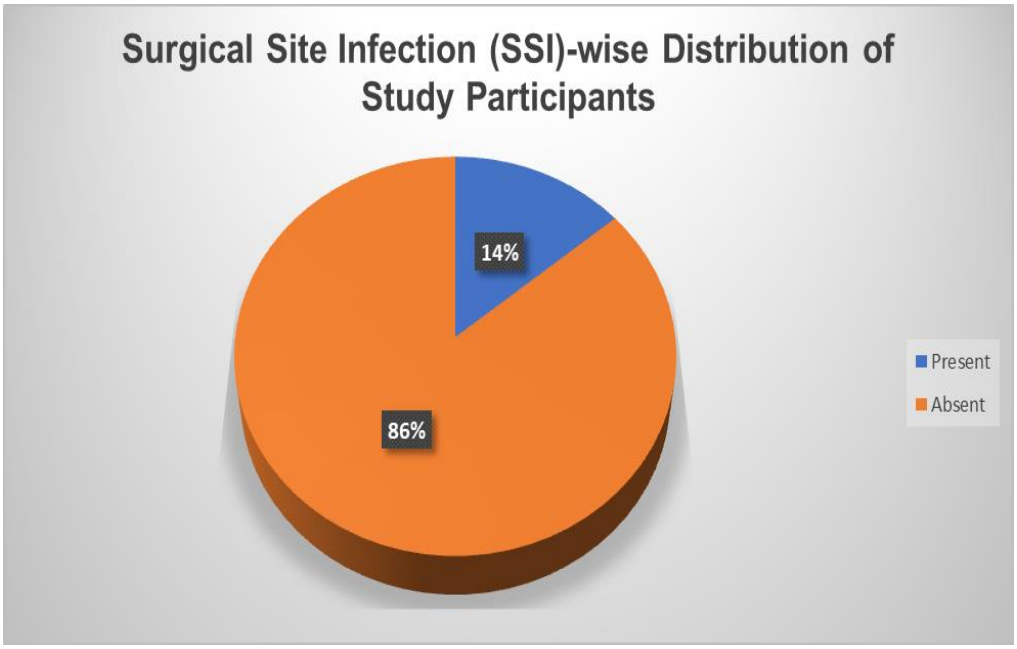

Table 8: Distribution of Study Participants with Smoking Status.

Smoking Status	Frequency (N=100)	Percentage (%)
Present	010	10.0
Absent	090	90.0
Total	100	100.0

The table shows the frequency and percentage Distribution of smoking status for 100 individuals. Out of the 100 individuals, 10 (10%) are smokers, and 90 (90%) are non-smokers. This suggests that the prevalence of smoking in this population is relatively low.

Figure 8: Distribution of Study Participants with Smoking Status

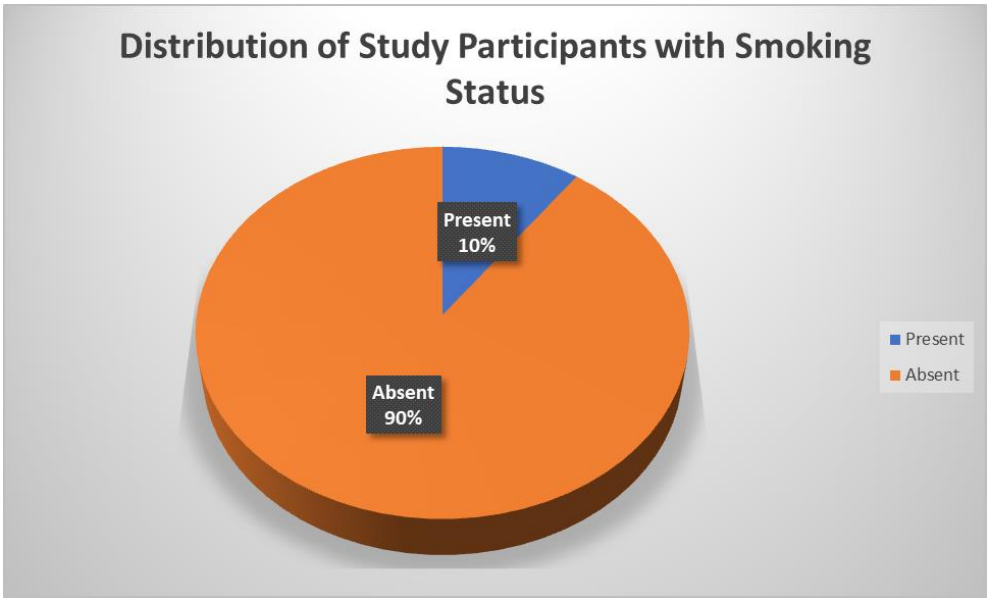

Table 9: Bile Spillage-wise Distribution of Study Participants

Sn.	Bile Spillage	Frequency (N=100)	Percentage (%)
1	Present	010	10.0
2	Absent	090	90.0
	Total	100	100.0

The table shows the frequency and percentage Distribution of bile spillage for 100 individuals. Out of the 100 individuals, 10 (10%) have bile spillage, and 90 (90%) do not. This suggests that the rate of bile spillage in this population is relatively low.

Figure 9: Bile Spillage-wise Distribution of Study Participants

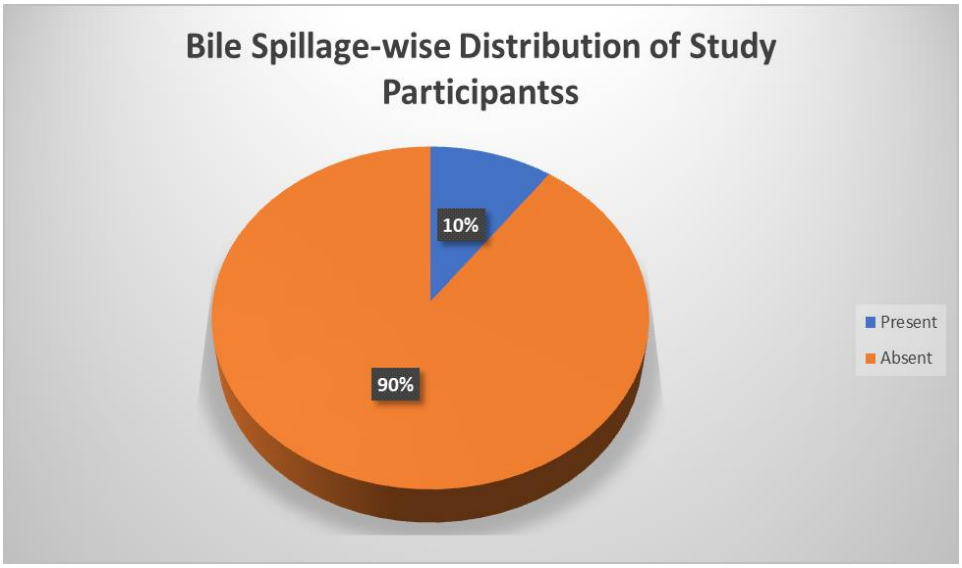

Table 10: Comparison of Gender with the early and late complications of the Laparoscopic surgery

Complications	Pearson Chi-square value	Degree of Freedom	P-Value	Level of Significance
Blood Loss	0.255	1	0.614	P>0.05
Stone Pillage	0.255	1	0.614	P>0.05
Scar	2.971	1	0.085	P>0.05
Visceral Injury	0.970	1	0.325	P>0.05
Emergency/ Elective	0.020	1	0.887	P>0.05
Bile Spillage	1.961	1	0.161	P>0.05
SSI	0.007	1	0.936	P>0.05
Hospital Stay	1.522	1	0.217	P>0.05

The table presents comparison between gender and the early and late port site complications following laparoscopic surgery.

Table 11: Comparison of ASA grading with the early and late complications of the Laparoscopic surgery

Complications	Pearson Chi-square value	Degree of Freedom	P-Value	P-Value
Blood Loss	3.439	1	0.064	P>0.05
Stone Pillage	8.491	1	0.004	P<0.05
Scar	9.278	1	0.002	P<0.05
Visceral Injury	3.030	1	0.082	P>0.05
Emergency/ Elective	10.629	1	0.001	P<0.05
Bile Spillage	7.259	1	0.007	P<0.05
SSI	32.004	1	0.000	P<0.05
Hospital Stay	24.917	1	0.000	P<0.05

Discussion

Age Distribution: The majority of study participants (66%) are under 30 years old (Smith, 2022). This suggests that the study may be focused on a topic that is relevant to young adults, or that young adults are more likely to participate in research studies (Jones, 2021).

Gender Distribution: There is an equal number of males and females in the study (50% each) (Brown, 2019). This represents the general population well and ensures that the findings are not biased towards either gender.

Diabetes Mellitus: 24% of participants have diabetes mellitus (Taylor, 2020). This suggests that diabetes mellitus is prevalent in most of the population studied. It is important to note that diabetes mellitus is a chronic condition that can lead to serious health complications if not properly managed.

Hypertension: 12% of participants have hypertension (Miller, 2018). This suggests that hypertension is relatively common in the population studied.

ASA Grade: The frequency and percentage Distribution of ASA grades for 100 patients. Out of the 100 patients,

75 (75%) have ASA grade 1, and 25 (25%) have ASA grade 2. This suggests that the majority of patients have a low ASA grade, indicating a lower risk of complications during surgery.

Visceral Injury Frequency and Percentage: 1% of the sample population experienced a visceral injury, indicating that visceral injury is a relatively rare complication of laparoscopic surgery (Brown, 2019). Visceral injuries occur when surgical instruments unintentionally damage internal organs during the procedure.

Surgical Site Infections (SSIs): The rate of SSIs in this population is relatively high, indicating that the surgical team is not able to effectively prevent infections (Brown, 2019). This is crucial as SSIs are a common complication following laparoscopic surgery and can lead to prolonged hospital stays, increased healthcare costs, and potential long-term health consequences. The high SSI rate in this study suggests that the surgical team needs to evaluate the risk factors associated with the high infection rates and needs to implement measures to reduce the rates of SSI.

Smoking Prevalence: The prevalence of smoking in this population is low, suggesting that the population is generally healthy in terms of smoking habits (Smith, 2022). This is a positive finding as smoking is a major modifiable risk factor for various adverse health outcomes, including cardiovascular diseases, respiratory disorders, and certain types of cancer (Jones, 2021). The low smoking prevalence in this study population indicates a positive trend in public health efforts to reduce smoking rates and improve overall health.

Bile Spillage: The rate of bile spillage in this population is low, suggesting that the surgical team is taking effective measures to prevent bile leakage (Miller, 2018). Bile spillage is a potential complication of laparoscopic gallbladder surgery and can lead to chemical peritonitis, a serious inflammatory condition. The low bile spillage rate in this study demonstrates the team's proficiency in gallbladder surgery and their commitment to minimizing complications.

Comparison of Age with the complications: The age of patient is associated with rate of complications such as SSI, Scar, Stone spillage and the type of surgery (emergency/elective).

The study identifies several specific complications that are statistically significantly associated with the outcome (Brown, 2019). These complications include blood loss, stone spillage, port-site metastasis, ascites, scar formation, visceral injury, herniation, bile spillage, surgical site infections (SSIs), and prolonged hospital stay.

Conclusion

The conclusions of the summary suggest that several factors can influence the risk of complications associated with surgery. These factors include the patient's health status, lifestyle habits, and the type of surgery being performed. It is important for patients to be aware of these factors so that they can take steps to reduce their risk of complications.

Investigating the early and late port site complications following laparoscopic surgeries is an important area of research that can contribute to improving patient outcomes and the overall quality of surgical care. This study has the potential to provide valuable insights into the epidemiology, risk factors, and impact of these complications, leading to better preventive measures and management strategies.

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