

# Outcome of Surgical Site Infection Following Inguinal Hernia Closure

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## Abstract:-

**Objective:** This study's goal is to look into how inguinal hernia surgery patients respond to surgical site infections (SSIs). The purpose of the study is to examine the association between the prevalence of SSIs and demographic factors such as age, body mass index (BMI), habitation type (urban/rural), presence of diabetes mellitus and hypertension, degree of education, length of hospital stay, and length of surgery.

**Methods:** Patients who underwent inguinal hernia closure surgeries were included in this retrospective analysis, which was carried out in a medical facility. A patient's demographics, BMI, type of habitation, diabetes and hypertension status, education level, length of hospital stay, length of operation, and presence or absence of surgical site infections were all collected from their medical records from feb to aug 2023. To evaluate the patient population's characteristics and the prevalence of SSIs, data analytic techniques included frequency distribution and percentage calculation. In order to identify correlations between factors and the occurrence of SSI, statistical tests were run.

**Results:** The study involved all of the patients. The age distribution displayed 35.1% in the 20–30 age, 21.1% in the 40–50 age, and 43.9 % in the 40–50 age. BMI categories were revealed with BMIs of 20–23, 23–25, and 25–28. Participants who lived in cities made up 22(29.7%) of the group, whereas participants who lived in rural areas made up 35.1 %. Diabetes mellitus was more common than hypertension 23 (20.2%) vs. 17(14.9%). The distribution of

education levels was as follows: 17(14.9 %) with no education, 46 (40.4%) with SSC-level education and 51(44.7%) with HSSC or higher education. Hospital stays lasting 1-3 days in 55 (48.2%) of cases and 3-6 days in 59 (51.8%) of cases, respectively. There were two categories for operation length: 1-3 months 59(51.8%) and 3-6 months 55 (48.2%). 22 (19.3%) of cases had surgical site infections, while 92 (80.7%) of cases had no infections at all.

**Conclusion:** The results of surgical site infections after inguinal hernia closure are clarified by this investigation. The frequency of SSIs highlights the significance of strict infection control procedures. Further investigation is required to determine the association between demographic factors and the prevalence of SSI. These findings have implications for post-operative care plans and surgical protocols that aim to reduce the risk of SSIs and improve patient outcomes. To fully comprehend the multifactorial nature of SSIs in inguinal hernia closure surgeries, additional study is required.

**Keywords:-** Inguinal Hernia, Surgical Site Infection, Diabetes, Hypertension, Age.

## I. INTRODUCTION

It is essential to make efforts to find and lower risks for persistent discomfort. Patient-related risk factors for persistent pain following inguinal hernia repair include things like young age, female sex, preoperative suffering, substantial pain

elsewhere, particular genotypes, and surgery. Open hernia repair, together with the postulated risk factors of nerve handling, mesh material selection, and fixation method<sup>1</sup>. Globally, about 20 million hernia repairs are made each year. The reported lifetime risk for groin hernia surgery is 3% for women and 27% for men. Chronic Postoperative Inguinal Pain (CPIP), which can be prevented with modern surgical methods, is the most unfavorable result of inguinal hernia surgery. When pain lasts more than three months, it is considered chronic<sup>2</sup>. Patients who had experienced severe pain during the immediate aftermath of hernia surgery were more likely to experience pain in the operated groin or testicles at the follow-up 8 years later. Eight years following hernia surgery, patients who had reported urinary tract issues were also more likely to experience pain in the ipsilateral testicles<sup>3</sup>. Numerous genital issues, including undescended testes, cystic fibrosis, bladder extrophy, increased intra-abdominal pressure, increased peritoneal fluid, and connective tissue abnormalities, may be exacerbated by an inguinal hernia<sup>4</sup>. Regardless of the approach utilized, the British Association of Day Surgery recommends performing 80% of inguinal hernia repairs as day cases. Primary inguinal hernia repairs (unilateral) were performed as day cases in 77.8% of cases in 2014–15, with rates varying amongst institutions from 67% to 88%<sup>5</sup>. 75% of abdominal wall hernias are caused by inguinal hernias. The most typical intra-abdominal tissues that cross the fascial defect and are susceptible to imprisonment and strangling are the omentum and small bowel<sup>6</sup>. The benefits of minimally invasive technologies, such as lowered wound problems, a lower recurrence rate, and a quicker recovery time, are particularly valued by patients as well as doctors<sup>7</sup>. The relationship between age, surgical approaches (LIHR and OIHR), and surgical results has not been investigated in prospective research. According to a retrospective study, LIHR also demonstrated similar benefits when used to treat inguinal hernia repair in older individuals<sup>8</sup>. The choice of whether to do non-emergency inguinal hernia surgery openly or laparoscopic ally depends on a number of factors, including the patient's unique medical history and anatomical structure, the surgeon's preferences, and the resources available at the patient's attending hospital<sup>9</sup>. Open surgery may be required for individuals with coagulopathy, severe preperitoneal adhesions, and local extraperitoneal hematoma<sup>10</sup>.

**II. METHODOLOGY**

To investigate the outcomes of surgical site infections (SSIs) following inguinal hernia closure surgeries, a retrospective observational study was carried out. To learn more about the connection between demographic factors and the prevalence of SSIs, patient data from medical records was analyzed. The study included 114 individuals in all who

underwent inguinal hernia closure surgeries at Mardan medical complex and teaching hospital mardan from February 2023 to august 2023. Medical records were used to collect patient information, including demographic data, BMI, residence type, presence of diabetes mellitus, presence of hypertension, education level, length of hospital stay, length of operation, and the frequency of SSIs. For the different age ranges (20–30, 30–40, and 40–50), frequencies and percentages were determined. The BMI groups (20-23, 23-25, and 25-28) were computed using frequencies and percentages. For both urban and rural habitation, frequencies and percentages were estimated. For the presence and absence of diabetes mellitus, frequencies and percentages were estimated. For the presence and absence of hypertension, frequencies and percentages were estimated. For those with no education, SSC-level education, and HSSC or higher education, frequencies and percentages were computed. For hospital stay lengths (1-3 days, 3-6 days), frequencies and percentages were computed. The frequency and percentages for the operation's duration (1-3 months, 3-6 months) were calculated. For the presence and absence of surgical site infections, frequencies and percentages were computed.

To ascertain the relationships between demographic factors and the frequency of SSIs, statistical analyses were run. To determine the importance of these correlations, logistic regression analysis and chi-square testing were used. Before beginning the investigation, institutional ethics committee consent was requested. Data security and patient privacy were maintained during the investigation. This study's methodology was designed to thoroughly examine how SSIs affected patients who had inguinal hernia closure surgeries. This study provides important insights for optimizing infection control practices and enhancing patient outcomes by examining the correlations between demographic characteristics and SSIs. The multifactorial character of SSIs will be better understood through more research, which will also influence preventive measures in this situation.

**III. RESULTS**

Total 114 patients data was analyzed out of which Males were 69(60.5%) and female 45(39.5%).

Table 1: age distribution

AGE DISTRIBUTION	FREQUENCY	PERCENTAGES
20-30	40	35.1%
30-40	50	43.9%
40-50	24	21.1%

Table: 2 Different categories with frequency and percentage details

Categories		Frequencies	percentages
BMI	AGE 20-30	31	27.2%
	23-25	38	33.3%
	25-28	45	39.5%
RESISENCE	URBAN	74	64.9%
	RURAL	40	35.1%
DAIBETES MELLITUS	PRESENT	23	20.2%
	ABSENT	91	79.8%
EDUCATION	UNEDUCATED	17	14.9%
	SSC	46	40.4%
	HSSC OR ABOVE	51	44.7%
HYPERTENSION	PRESENT	17	14.9%
	ABSENT	97	85.1%
HOSPITAL STAY	1-3 DAYS	55	48.2%
	3-6 DAYS	59	51.8%
DURATION OF Surgery	1-3 MONTHS	59	51.8%
	3-6 MONTHS	55	48.2%
SUR SITE INFECTION	PRESENT	22	19.3%
	ABSENT	92	80.7%

TABLE 3: P-value and their details

Categories		Surgical site infection		p-value
		Present	Absent	
Age group	20-30	5(12.5%)	35(87.5%)	0.259
	30-40	10(20%)	40(80%)	
	40-50	22(19.3%)	92(80.7%)	
gender	Male	17(24.6%)	52(75.4%)	0.074
	female	5(11.1%)	40(88.9%)	
bmi	20-33	4(12.9%)	27(87.1%)	0.261
	23-25	6(15.8%)	32(84.2%)	
	25-28	12(26.7%)	33(73.3%)	
residence	urban	22(29.7%)	52(70.3%)	0.001
	rural	0(0%)	40(100%)	
education	uneducated	4(23.5%)	13(76.5%)	0.671
	Ssc	10(21.7%)	36(78.3)	
	Hssc or above	8(15.7%)	43(84.3%)	
duration	1-3 months	5(8.5%)	54(91.5%)	0.002
	3-6 months	17(30.9%)	38(69.1%)	
Hospital stay	1-3 days	11(20%)	44(80%)	0.855
	3-6 days	11(18.6%)	48(81.4%)	
Diabetes mellitus		5(21.7%)	18(28.3%)	0.74
		17(18.7%)	74(81.3%)	
hypertension		6(35.3%)	11(64.7%)	0.07
		16(16.5%)	81(83.5%)	

**IV. DISCUSSION**

Inguinal hernia closure procedure-related surgical site infections (SSIs) are investigated in the current study in connection to a variety of demographic parameters. Age, gender, BMI, place of residence, education, length of surgery, length of hospital stay, diabetes mellitus, and hypertension are

all included in the data analysis. The analysis of the p-values that follows sheds light on potential relationships and their implications for SSIs. In a research by Singh S et al., 51.85% of patients fell into the 45–64 age range, 31.48% of cases fell into the 15–44 age range, and 16.67% of cases fell into the 65–plus age range<sup>11</sup>. Males made up 60.5% (69 patients) of the 114 patients in total that were analyzed, while females made up 39.5% (45 patients). 51.85% of cases in the 45–64 age range, 31.48% of cases in the 15–44 age range, and 16.67% of cases older than 65 years were included in a study by Singh S et al<sup>12</sup>. With 35.1% of respondents in the 20–30 age range, 43.9% in the 30–40 age range, and 21.1% in the 40–50 age range, the age spread was remarkable. With this distribution, representation across several age cohorts is guaranteed, allowing for a thorough examination. According to a study by Hariprasad and Srinivas, occurrences of severe inguinal hernias predominately affect patients between the ages of 51 and 60 (22.5%)<sup>13</sup>. The information examined the connection between home type and BMI as well. The BMI category with the highest frequency was 25-28 (39.5%), followed by 23-25 (33.3%) and 20-23 (27.2%). Urban housing made up 64.9% of all housing, while rural housing made up 35.1%. Increasing public knowledge will likely result in early detection and a decrease in disease morbidity<sup>14</sup>. The distribution of observed BMI and residences indicates a varied patient group. Twenty.2% of patients had diabetes mellitus, while 14.9% had hypertension. All varieties of open inguinal hernia procedures have benefits and drawbacks. Tissue tension is attributed to existing non-prosthetic healing (Should ice), which has a recurrence rate that varies from 0.7 to 17% depending on experience<sup>15</sup>. These results highlight the significance of taking pre-existing medical problems that can affect SSIs into account. study reported 85 patients out of 100 who had inguinal hernia surgery under local anesthesia were

released the same day. The need to treat comorbid diseases (hemophilia, chronic renal failure), prolonged surgery, postponing surgery until later in the day, surgical complications (scrotal hematoma, perioperative vagal stimulation), postoperative nausea and pain, and these factors all prevented same-day discharge<sup>16</sup>. In terms of surgery time, 51.8% of patients had operations that lasted 1-3 months, while 48.2% had surgeries that lasted 3-6 months. Regarding postoperative complications, Khairy et al. reported 4 seroma cases, 4 wound infection cases, and 4 hematoma cases among 100 patients<sup>17</sup>. 51.8% of patients stayed 1-3 days in the hospital, while 48.2% stayed 3-6 days. P-value analysis in respect to SSIs offers insightful information. Notably, statistically significant correlations between the frequency of SSIs and dwelling type ( $p = 0.001$ ), surgical time ( $p = 0.002$ ), and gender ( $p = 0.074$ ) were found. According to Bansod et al., surgical site infection occurred in two patients (1.66%), while three patients (2.5%) experienced seroma<sup>18</sup>. A longer surgical procedure was linked to a higher occurrence of SSIs, as was living in an urban area. Compared to women, men showed a tendency for higher SSIs.

## V. CONCLUSION

The examination of the data suggests possible correlations between demographic parameters and the occurrence of SSIs after inguinal hernia repair. While more investigation and study are required to determine causality, the study emphasizes the significance of taking patient demographics into account when estimating the risk of SSIs. Healthcare professionals can use this information to establish targeted infection prevention efforts and enhance patient outcomes.

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