



RISK FACTORS FOR SURGICAL SITE INFECTION IN POST-LAPARATOMY SURGERY PATIENTS AT PANYABUNGAN REGIONAL HOSPITAL

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Abstrak: Pendahuluan: *Surgical Site Infection* (SSI) atau infeksi daerah operasi merupakan infeksi yang terjadi ketika mikroorganisme dari kulit, bagian tubuh lainnya, atau lingkungan masuk ke dalam sayatan operasi yang terjadi dalam waktu 30 hari setelah pembedahan. Apabila terdapat implan, infeksi dapat terjadi hingga satu tahun setelah pembedahan. Infeksi ini ditandai dengan adanya nanah, peradangan, pembengkakan, nyeri, dan sensasi terbakar. Pada dinding abdomen yang cukup luas, risiko terjadinya infeksi, khususnya infeksi luka pascaoperasi, menjadi lebih tinggi. Tujuan: Mengidentifikasi faktor risiko yang berkontribusi terhadap kejadian *Surgical Site Infection* pada pasien yang menjalani operasi laparotomi di RSUD Panyabungan. Metode: Penelitian ini merupakan penelitian observasional analitik dengan desain *cross-sectional* yang dilakukan dengan mengidentifikasi faktor risiko yang berhubungan dengan kejadian *Surgical Site Infection* (SSI) pada pasien yang menjalani operasi laparotomi. Hasil: Tidak terdapat hubungan antara usia, jenis kelamin, dan kondisi medis pasien pascalaparotomi di RSUD Panyabungan dengan kejadian *Surgical Site Infection* yang dialami pasien. Hal tersebut dibuktikan berdasarkan hasil uji statistik yang menunjukkan bahwa nilai yang diperoleh lebih besar daripada nilai p pada setiap pengujian yang dilakukan. Kejadian *Surgical Site Infection* di RSUD Panyabungan tergolong cukup rendah.

Kata kunci: Risiko Infeksi Daerah Operasi, Operasi Pascalaparotomi, Surgical

Abstract: Introduction: *Surgical Site Infection* (SSI) is an infection that occurs when microorganisms from the skin, other body parts, or the environment enter the incision that occurs within 30 days after surgery, and if there is an implant, infection can occur up to one year after surgery. This infection is characterized by the presence of pus, inflammation, swelling, pain, and a burning sensation. In a fairly wide abdominal wall, the risk of infection, especially post-surgical wound infection, increases. Objective: To identify risk factors that contribute to the incidence of surgical site infection in patients undergoing laparotomy surgery at Panyabungan Regional Hospital. Method: This study is an observational analytical study with a cross-sectional design by identifying risk factors associated with the incidence of surgical site infection (SSI) in surgical patients undergoing laparotomy surgery. Results: There is no relationship between age, gender, and medical conditions of post-laparotomy patients at Panyabungan Regional Hospital with the incidence of surgical site infection experienced by patients. This is evidenced by the results of statistical test numbers that are greater than the p value of each test performed. The incidence of surgical site infections at Panyabungan Regional Hospital is quite small.

Keywords: Risk of Surgical Site Infection, Post-Laparotomy Surgery, Surgical

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INTRODUCTION

Procedures for conditions such as ovarian cancer, fallopian tube cancer, uterine cancer, liver cancer, gastric cancer, colon cancer, bladder cancer, ectopic pregnancy, uterine fibroids, peritonitis, and pancreatic cancer often require laparotomy (Salimi et al., 2022). A laparotomy is a surgical procedure that involves making an incision through the midline or flank of the abdominal wall to visualize the internal organs. Laparotomy is usually performed at the linea alba (median), paramedian, and flank sites. After the treated area is exposed, repair is performed, culminating in closure and suturing of the wound (Monahan et al., 2020).

Surgical Site Infection (SSI) is an infection that occurs when microorganisms from the skin, other body parts, or the environment enter an incision within 30 days of surgery. If an implant is present, infection can occur up to a year after surgery. This infection is characterized by pus, inflammation, swelling, pain, and a burning sensation. The wide abdominal wall increases the risk of infection, especially post-surgical wound infections. This risk needs to be managed properly to prevent serious complications in post-operative patients (Wistrand et al., 2022).

The results of the Indonesian Ministry of Health survey showed a significant increase in laparotomy cases from year to year, with the number of cases increasing from 162 in 2005 to 983 cases in 2006, and 1,281 cases in 2007. A preliminary study conducted at Kanjuruhan Kepanjen Regional Hospital on February 6, 2013 revealed that from January to December 2012, there were 129 laparotomy procedures, and 5% of them experienced Surgical Site Infection (SSI). This shows that despite the increasing number of surgical procedures, the risk of post-operative infection remains a major concern that must be managed well to reduce morbidity and improve the quality of patient care.

METHOD

This study employed an analytical observational approach with a quantitative approach and a cross-sectional design. The quantitative approach was used because the study focused on measuring variables in a structured manner and testing the relationships between variables based on data obtained from respondents. The cross-sectional design was used to identify risk factors associated with Surgical Site Infection (SSI) in post-laparotomy surgical patients at Panyabungan Regional Hospital. The study design was chosen based on the study's objective of identifying the relationship between patient characteristics, namely age, gender, and medical conditions, with SSI incidence during the study period (Creswell & Creswell, 2023; Sugiyono, 2022).

The research data was obtained from the medical records of patients who underwent laparotomy surgery at Panyabungan Regional Hospital. The research instrument was a data collection sheet used to record information according to the research variables, including gender, age, medical condition, and SSI incidence. Data collection was carried out by identifying information recorded in the patient's medical record according to the research needs. The use of structured data was carried out so that the information obtained could be

grouped based on the research variables and subsequently analyzed quantitatively (Sugiyono, 2022).

Data analysis techniques were performed using univariate and bivariate analyses. Univariate analysis was used to describe the frequency and percentage distributions of each research variable. Furthermore, bivariate analysis was used to determine the relationship between the independent variables, namely age, gender, and medical condition, and the dependent variable, the incidence of SSI. Relationship testing was performed using the chi-square or t-test statistical test according to the characteristics of the data being analyzed. The basis for decision-making was a 5% significance level or $\alpha = 0.05$. Therefore, a p-value <0.05 indicates a significant relationship, while a p-value >0.05 indicates no significant relationship (Sugiyono, 2022).

The study population consisted of all patients undergoing laparotomy surgery at Panyabungan Regional Hospital during the study period. This population served as the basis for determining subjects suitable for the study objectives. The study sample consisted of post-laparotomy surgical patients who met the study criteria. Based on the research data, a sample size of 134 patients was used. The sample was determined based on available patients who met the study criteria. All data obtained were then used to describe patient characteristics and analyze the relationship between age, gender, and medical conditions with the incidence of SSI (Sugiyono, 2022).

The research procedure began with identifying post-laparotomy surgical patients at Panyabungan Regional Hospital who met the criteria for the study sample. Next, data was collected from patient medical records by recording characteristics corresponding to the study variables, namely gender, age, medical condition, and SSI incidence. The collected data were then examined and grouped based on each research variable. The next stage was univariate analysis to obtain the frequency distribution and percentage of each variable. After that, bivariate analysis using statistical tests was performed to determine the relationship between age, gender, and medical condition with SSI incidence. The results of the data processing and analysis were then used to determine whether or not there was a relationship between these factors and SSI incidence in post-laparotomy surgical patients at Panyabungan Regional Hospital (Creswell & Creswell, 2023; Sugiyono, 2022).

RESULTS AND DISCUSSION

Research result

This research was conducted at Panyabungan Regional Hospital, the number of samples that met the inclusion criteria was 134 patients, the data from this research was primary data obtained from the medical records of patients who had undergone laparotomy surgery at Panyabungan Regional Hospital.

General description

This research was conducted at Panyabungan Regional Hospital, Mandailing Natal Regency, North Sumatra Province. It is a type C hospital offering basic specialist medical services. One of the services provided is surgical services. Patients undergoing surgical services are at risk of surgical site infection, a risk associated with numerous factors that can trigger surgical site infections, particularly in patients undergoing laparotomy.

Univariate Analysis

The results of the univariate analysis are used to explain the description or distribution

of each variable to be studied, in this case the dependent and independent variables. In this study, the number of respondents studied was 134 respondents. Table 1 presents the frequency and percentage distribution based on the number of post-laparotomy patients.

Table 1 Distribution of Sample Size

VARIABLES	FREQUENCY (n)	PERCENTAGE (%)
Gender		
Woman	93	69.4
Man	41	30.6
Total	134	100.0

Gender

The study found that surgical site infections were more common in men than in women. Statistical tests revealed no association between gender and surgical site infections. Both genders with post-laparotomy wounds can experience surgical site infections.

In research conducted on Microbiology (Clinic) Faculty of Medicine Unsri/MH Palembang General Hospital found 30 patients who met the inclusion criteria consisting of 17 male patients (56.7%) and 13 female patients (43.3%). The majority of patients were male. The results of the study conducted at Panyabungan Regional Hospital were similar to those conducted at MH Palembang General Hospital. The results at Panyabungan Regional Hospital showed that the disease was more common in males than females. Meanwhile, at MH Palembang General Hospital, the results showed that it was experienced more by men than women.

Variables	Frequency (N)	Percentage (%)
Age		
Early Adulthood	65	48.5
Late Adulthood	43	32.1
Elderly	26	19.4
Total	132	100.0

The results of this study showed that elderly patients are the age group most likely to experience surgical site infections compared to other patient age groups. This is proven by a study at Haji Adam Malik General Hospital, Medan, from April to September 2010. Of 534 patients, the SSI prevalence rate was 5.6%, with the largest age group being those over 65 years old, at 33.3%. However, after statistical tests, no significant figures were obtained to prove a relationship between age and the incidence of surgical site infections at Panyabungan General Hospital.

In research in MH Palembang General Hospital also, obtained The largest age group was 12-21 years old, namely 11 patients (36.7%). So it was more common in young adults. The results were not the same as those studied at Panyabungan Regional Hospital, where it was more experienced by the elderly, while at MH Palembang General Hospital it was more common in early adulthood.

Variables	Frequency (N)	Percentage (%)
Medical Conditions		
Obesity	25	18.7
There isn't any	65	48.5

Diabetes	44	32.8
Total	134	100.0

This study found that patients with diabetes were the most likely to experience surgical site infections compared to all other conditions included in the study. However, statistical tests showed no association between the patient's medical condition and the incidence of surgical site infections. Meanwhile, a study at MH Palembang General Hospital found that comorbid diabetes mellitus had a 1.87-fold increased risk of SSI.

The results of the research conducted at Panyabungan Regional Hospital and the research at MH Palembang General Hospital were the same, with the results being more often caused by diabetes comorbidities.

Variables	Frequency (N)	Percentage (%)
SSI (Surgical Site Infection)		
There is	24	17.9
No	110	82.1
Total	134	100.0

Bivariate Analysis

To determine whether there is a relationship between each independent variable and the dependent variable, a bivariate analysis was carried out using statistical tests.

Table 2 Relationship between Respondent Characteristics and Research Variables

Variables	SSI (Surgical Site Infection)		P Value
Gender	There is	No	0.939
Woman	8 (6%)	33(24.6%)	
Man	16 (11.9%)	77(57.5%)	
Total	24 (17.9%)	110(82.15)	
Age			0.157
Early Adulthood	8(6%)	57(42.5%)	
Late Adulthood	7(5.2%)	36(26.9%)	
Elderly	9(6.7%)	17(12.7%)	
Total	110 (82.1%)	24(17.9%)	
Medical Conditions			0.334
Obesity	3(2.2%)	22(16.4%)	
There isn't any	9(6.7%)	56(41.8%)	
Diabetes	12(9%)	32(23.9%)	
Total	110(82.1%)	24(17.9%)	

Table 2 shows that of the 134 respondents studied, there was no association between gender, age, and medical condition with the incidence of surgical site infections. Based on the chi-square test, the p-value obtained was greater than alpha, at 5%, or a p-value >0.05. Therefore, it can be concluded that not all factors included in the variables are associated with the incidence of surgical site infections at Panyabungan Regional Hospital.

Discussion

Respondent Characteristics

1. Gender: Research results showed that surgical site infections were more common in men than in women. Statistical testing revealed no association between gender and the incidence of surgical site infections. Both genders with post-laparotomy wounds can

experience surgical site infections.

2. Age: The results of this study showed that elderly patients are the age group most likely to experience SSI compared to other age groups. This was proven by a study at Haji Adam Malik General Hospital, Medan, from April to September 2010. Of 534 patients, the prevalence of SSI was 5.6%, with the largest age group being over 65 years old, at 33.3%. However, after statistical tests, no significant figures were obtained to prove a relationship between age and the incidence of surgical site infections at Panyabungan General Hospital.
3. Medical Conditions: This study found that patients with diabetes were the most likely to experience surgical site infections compared to all other medical conditions included in the study. However, statistical tests showed no association between the patient's medical condition and the incidence of surgical site infections.

CONCLUSION AND SUGGESTIONS

Conclusion

1. There was no association between the age, gender, and medical condition of post-laparotomy patients at Panyabungan Regional Hospital and the incidence of surgical site infections. This was demonstrated by statistical test results that were greater than the p-value for each test.
2. The incidence of surgical site infections at Panyabungan Regional Hospital is quite small.

Suggestion

1. In this research, there may still be many shortcomings in the research, so that in the future there will still be a lot that needs to be improved.
2. More samples are needed in this surgical site infection study.
3. In this study, hospitals also need to improve the implementation of strict and good sterilization and antisepsis procedures to reduce the risk of surgical wound infections.

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