The Relationship of Body Mass Index with Length of Stay in Symptomatic Cholelithiasis Patients Who Have Undergoing Open Cholecystectomy at RSUS Lippo Village Karawaci Hospital

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Abstract

Background: Gallstones, also known as cholelithiasis, are hardened deposits of digestive fluids that develop in the gallbladder. A serious medical condition called cholelithiasis is frequently managed with general surgery. One of the treatments for cholelithiasis is an open cholecystectomy. It will take some time to recover from this surgical procedure at the hospital. The period of hospitalization will depend on the patient's weight. Numerous research findings continue to conflict with this study. As a result, this study was carried out to examine the connection between BMI and the length of hospital stay in the open cholecystectomy technique.

Methods: This study used a cross-sectional study design with a sample population of cholelithiasis patients at Siloam Hospital. The sample size of 51 was selected using a purposive sampling technique. Data is taken from the patient's medical record and the data collected will be analyzed using *Mann-U Whitney*.

Result: From 51 samples, the mean length of stay for subjects with BMI < <23 kg/ m^2 was 3 days, with the lowest value being 1 day and the highest value was 5 days. Meanwhile, the mean length of stay for subjects with BMI > 23 kg/ m^2 was 3 days with the lowest value was 2 days and the highest value was 6 days. From the Mann-U Whitney test, it was found that the results of the comparison were not significant (p> 0.05).

Conclusions: This study shows there is no relationship between BMI and duration of hospitalization in cholelithiasis symptomatic patients undergoing open cholecystectomy surgery

Introduction

Cholelithiasis or gallstones are deposits of digestive fluid that harden and form in the gallbladder. Cholelithiasis is a health problem that affects the population significantly because it can be found in 10% to 15% of the general population[1], specifically 6% in men and 9% in women.[2]

The prevalence of cholelithiasis varies by country. In Asia, Gallstone prevalence rates range from 3.2% to 15.6%. In Indonesia, cholelithiasis receives minimal attention because it has asymptomatic symptoms, so it is difficult to detect. Based on studies conducted at RSUP Prof. Dr. R.D. Kandou

Manado in the period from October 2015 to October 2016, 113 cases of cholelithiasis were found.[3] Cholelithiasis can be caused by many factors such as age, gender, estrogen, and body mass index (BMI).[4]

BMI is a measure of body fat which is measured by dividing body weight by the square of body height on a meter scale. 6 Based on the Asia Pacific classification, BMI is categorized into 3 groups, namely: underweight (BMI <18.5 kg/m2), overweight individuals normal (18.5-22.9 kg/m2), and overweight (≥23 kg/m2).[5] With each increase in BMI, the possibility of cholelithiasis increases. Based on studies, it was found that the risk of gallstone disease increases by 7% for every increase in BMI. The incidence of cholelithiasis occurs in 5% of the general population and this percentage increases significantly in the obese population to reach 45%. [6]

Based on a study conducted in New South Wales in 2016, it was concluded that an increase in BMI was positively correlated with an increase in the duration of hospital stay.[7] This contrasts with the results of research by Bulian (2018) which states that there is no relationship between BMI and the length of hospitalization. This research is supported by other research by Bowling et al which states that obesity does not affect the duration of hospital stay.[8]

In addition, the authors found a gap in literature because similar previous research was only conducted on patients who underwent laparoscopic cholecystectomy techniques. Based on the explanation of the problem above, the author wants to conduct research looking for the relationship between BMI and length of stay in patients undergoing surgery using the open cholecystectomy technique.

Material And Methods

This study combines a cross-sectional study with an unpaired numerical comparative analytical study. Conducted from January to June of 2023.

Patients with symptomatic cholelithiasis, aged 18 to 60, who had open cholecystectomy at RSUS Lippo Village Karawaci were the subjects of this study. Data gathered from medical records is used in sampling. Purposive sampling was used to acquire data from the patient's medical record.

The study will not include samples that match the exclusion criteria, such as patients who did not undergo open cholecystectomy at Siloam Hospitals Lippo Village, patients with a history of abdominal surgery, patients with a history of liver disease

The Statistical Package for the Social Sciences (SPSS) software version 25 was used to process and analyse the research data that had been obtained. When the data distribution was not normal, the Man-U Whitney test was used for statistical analysis; when it was normal, the T-test was used. The University of Pelita Harapan's Faculty of Medicine ethical committee approved this study under the reference 010/SHLV/HA/I/23.

Result

According to Table 1, there were 37 female individuals and 14 male subjects among the 51 processed subjects, according to the collected characteristics. Following the calculation of each patient's body mass index, it was discovered that 25 (49%) of the patients fell into the Asia-Pacific criteria's ideal body weight category (BMI <23 kg/m2), while 26 (51%) fell into the overweight category (BMI >23 kg/m2). The results of the data analysis showed that the subjects who had open cholecystectomy had a median age of 47 years, with the youngest being 19 years old and the oldest being 60 years old.

After doing the calculations, the number of patients with comorbid hypertension was 4 people in the BMI <23 kg/m2 and BMI >23 kg/m2 categories. Meanwhile, 2 patients who had comorbid diabetes were in the BMI <23 kg/m2 category and 1 person was in the BMI >23 kg/m2 category.

Table 1. Demographic of samples

Variable	BMI <23 (%)	BMI >23 (%)
Total	25 (49)	26 (51)
Sex		
Male	5 (20)	9 (34,61)
Female	20 (80)	17 (65,38)
Age		
Median (min/max)	51 (19/60)	44 (22/60)
Mean ± SD	48,2 ± 10,972	43,1 ± 11,838
Comorbid Hypertension		
Yes	4 (16)	4 (15,38)
No	21 (84)	22 (84,61)
Diabetes		
Yes	2 (8)	1 (3,84)
No	23 (92)	25 (96,15)

The results obtained show a significance value of $p<0.05$, which states that the data distribution is not normal. Therefore, the analysis used the Mann-U Whitney method. A bivariate analysis of the data was then conducted.

The results of the SPSS analysis showed that the subjects with a BMI <23 kg/m2 had a median length of stay of 3 days, with the lowest value of 1 day and a maximum value of 5. This is consistent with research by Muqim et al. showing that patients stayed in the hospital for three days following cholecystectomy surgery.[9] For participants with a BMI >23 kg/m2, the median duration of stay was 3 days, the lowest value was 2 days, and the maximum value was 6 days. The comparison results, according to the Mann-U Whitney test, were not significant ($p > 0.05$).

Table 2. Demonstrated bivariate analysis of Independent Variable toward Length of Stay

Variable		n	Median	Min/Max	P Value
BMI					
	<23	25	3	1/5	0.431
	>23	26	3	2/6	

Discussion

The purpose of this cross-sectional, unpaired numerical comparative analytical study was to find out if there was a connection between patient's duration of stay following open cholecystectomy surgery and their BMI. In February and March of 2023, data from medical records were gathered at Siloam Hospital Lippo Village Pavilion B. 51 samples were gathered for this investigation, and every

person met the inclusion and exclusion requirements to be included in the research.

Based on the results of the research that has been carried out, it was found that the research subjects were dominated by women (72.5%) compared to men (27.5%). This is in line with the theory that women naturally have higher estrogen levels than men, resulting in higher cholesterol gallstone formation. The results of the Mann-U Whitney test showed that the comparison results were not significant ($p > 0.05$) between BMI and the length of stay in patients who underwent open cholecystectomy surgery.

The findings of this study contrast those of a 2016 study conducted by New South Wales, which found that increased BMI was positively connected with increasing length of hospital stay.[7]

Nonetheless, the findings of my investigation align with the findings of Bowling et al.'s study, which found no relationship between obesity and hospital stay length. According to the study, there was no significant difference in the length of hospital stay or fatality rates between the obese and non-obesity groups, however, complications occurred more frequently in the obese group.[10]

According to Simopoulus et al, the presence of inflammation or a combination of obesity and abdominal surgery previously was a major detrimental factor for patients. It can be concluded that the increase in the duration of hospitalization is multifactorial, especially with a history of abdominal surgery. As many as 35% of obese patients undergoing surgery may experience wound healing problems. This is due to the risk of adhesion formation in patients who have a history of abdominal surgery. The formation of these adhesions affects the patient's recovery process.

Conclusion

Based on the results and discussion presented using a cross-sectional study design in symptomatic cholelithiasis patients who underwent open cholecystectomy surgery at Siloam Hospital Lippo Village, it can be concluded that there is no statistically significant comparison ($p > 0.05$) between the length of stay in patients with a BMI of 23 kg/m2 and patients with a BMI of >23 kg/m^2.

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