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Original Article

The Effect of Hypertension as a Comorbid Factor on the Length of Stay in Patients Undergoing Cholecystectomy

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Abstract

Background: One of the gold standard procedures for cholelithiasis is cholecystectomy. Cholecystectomy has numerous variated Length of stay results relies upon every nation and medical clinic. Hypertension is perhaps the most widely recognized comorbid factors and are thought to impact prolonged length of stay.

Aim of Research: To study the effect of hypertension as a comorbid factor on the length of stay in patients undergoing cholecystectomy in Dr. Ramelan Naval Hospital Surabaya from June 2019-September 2020.

Method of Research: This is an analytic descriptive research with retrospective study. The sampling technique used in this research is total sampling. The data were collected from medical record data of patients at the Internal Medicine and Digestive Surgery Polyclinic.

Result of Research: The number of patients who underwent cholecystectomy with hypertension who underwent a length of stay > 5 days were 36 people (83.7%). The result from the Coefficient Contingency test shows that there is a correlation between hypertension as a comorbid factor and the length of stay (p<0,0001).

Conclusion: This research shows that there is comorbidity such as hypertension affects the length of stay in cholecystectomy.

Keyword: *Cholelithiasis, Cholecystectomy, Hypertension, Length of Stay*

Introduction

One of the gold standard procedures for cholelithiasis is cholecystectomy [1,2]. Cholecystectomy surgery can be assessed from the rate of morbidity, mortality and length of stay as the outcomes.

Length of stay is an estimation of the absolute number of days a patient should be hospitalized. The way to decide the length of stay is to deduct the date of release from the hospital (regardless of whether alive or dead) from the date of first hospitalization [3,4]. The normal length of stay for patients going through cholecystectomy medical procedure is 5 days, the

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length of stay is drawn out on the off chance that it requires over 5 days [5].

Hypertension is some of the most common comorbid factors and are thought to influence prolonged length of stay, 22% of the world's population suffers from hypertension [6], a study conducted by Nera Agabiti in 2013 said that there were 1089 (8.0%) patients with hypertension as a comorbid factor [7]. Srinivas J. Ivatury also reported that there were 92 (39.7%) patients with hypertension as preoperative factor [8].

This examination was led to decide if there is an impact of hypertension, on the event of the prolonged length of stay after cholecystectomy medical procedure. Counteraction of delayed length of stay after cholecystectomy will decrease the expense of care [5,9].

Method

Research Design

The design of this research is descriptive analytic. This is a qualitative research.

Research Method

This research uses secondary data. The data were gathered from medical record information of patients at the Internal Medicine and Digestive Surgery Polyclinic Dr. Ramelan Naval Hospital Surabaya from June 2019 - September 2020.

Population and Sample

The sample used in this study was obtained using non-probability sampling with the sampling technique carried out by total sampling where the number of samples was the same as the population [10]. The sample used in this study were patients who were treated in the operating room at Dr. Ramelan Naval Hospital Surabaya.

Inclusion Criteria

All cholelithiasis patients underwent cholecystectomy and were treated in the operating room at Dr. Ramelan Naval Hospital Surabaya from June 2019 - September 2020.

Exclusion Criteria

Patients with fragmented/missing medical records, a history of abdominal trauma, abdominal surgery, and biliary system malignancies at Dr. Ramelan Naval Hospital Surabaya.

Sample Size

The sample size in this study was all the medical record data of patients with cholelithiasis that met the inclusion and exclusion criteria for the study at Dr. Ramelan Naval Hospital Surabaya for the period June 2019 - September 2020.

Data Analysis

To see the significant difference in the length of days of treatment in cholecystectomy patients with hypertension, the Contingency Coefficient statistical test was used. Furthermore, the test for differences in the length of day of treatment between groups with hypertension and without hypertension was carried out using the Contingency Correlation test. The degree of significance used was $\alpha = 0.05$.

Result

From the results of medical record data research at the Internal Medicine and Digestive Surgery Polyclinic, Dr. Ramelan Naval Hospital Surabaya June 2019-September 2020, the total number of samples is 201 patients, yet the number of samples that qualified inclusion and exclusion criteria was 146 patients. Furthermore, the data obtained will be analyzed descriptively and analytically.

Table 1. Distribution of Diagnose and Length of stay

Diagnose	Hypertension	Length of stay ≤ 5 days	Length of stay > 5 days	P value
Cholelithiasis	With	5	16	0.002
		6.4%	20.5%	
	Without/Others Comorbid	36	21	
		46.2%	26.9%	
Cholelithiasis with cholangitis	With	0	3	0.546
		0.0%	25.0%	
	Without/Others Comorbid	1	8	
		8.3%	66.7%	
Cholelithiasis with cholecystitis	With	2	10	0.030
		5.0%	25.0%	
	Without/Others Comorbid	15	13	
		37.5%	32.5%	
Cholelithiasis with cholecystitis with cholangitis	With	0	1	
		0.00%	100.0%	
Cholelithiasis with cholecystitis with obstruction	With	0	6	
		0.00%	54.5%	
	Without/Others Comorbid	0	5	
		0.00%	45.5%	
Cholelithiasis with obstruction	With	0	1	0.248
		0.0%	25.0%	
	Without/Others Comorbid	2	1	
		50.0%	25.0%	

Based on Table 2. It can be seen that there were 2 procedures were performed in this study, the number of patients who underwent laparoscopic cholecystectomy were 90 (61.6%), and 56 (38,4%) patients underwent open cholecystectomy. it was found that a significant difference was due to the value of <0.0001 (p <0.050).

Table 2. Distribution of Procedures and Length of stay

Procedures	Length of Stay ≤ 5 days	Length of stay > 5 days	P Value
Laparoscopic cholecystectomy	53	37	<0.0001
	36.3%	25.3%	
Open Cholecystectomy	8	48	
	5.5%	32.9%	

Based on Table 3. It can be seen that the number of patients who underwent cholecystectomy with hypertension who underwent a length of stay > 5 days were 36 people (24.7%), and 7 people who underwent ≤ 5-day length of stay (4.8%).

Table 3. Distribution of Hypertension and Length of stay

Comorbid Factor	*Length of Stay* > 5 days	*Length of Stay* ≤ 5 days	P Value
Hypertension	36 (24.7%)	7 (4.8%)	<0.0001
Non-Hypertension	49 (33.6%)	54 (37.0%)	

The number of patients who underwent cholecystectomy without hypertension who underwent treatment days > 5 days was 49 (33.6%), and 54 people (37.0%) had ≤ 5 days of treatment. From the statistical analysis of the Contingency Coefficient Correlation, it was found that a significant difference was due to the value of <0.0001 (p <0.050).

Based on Table 4. The number of geriatric patients who underwent a length of stay > 5 days were 12 (8.2%), and 9 (6.2%) patients who underwent ≤ 5-day length of stay, without a significant difference due to the value of p >0.050 (0.914).

Table 4. Distribution of Geriatric status and Length of stay

Status	Length of Stay ≤ 5 days	Length of Stay > 5 days	P value
Non-Geriatric	52	73	0.914
	35.6%	50.0%	
Geriatric (>65 years old)	9	12	
	6.2%	8.2%	

Discussion

This study is a descriptive analytical study using secondary data from the medical records of patients from internal medicine and digestive surgery polyclinic at Dr. Ramelan Naval Hospital Surabaya. In this study, 6 (26.1%) cases with diabetes mellitus experienced morbidity. The results showed that diabetes mellitus influenced the occurrence of morbidity. This study has the same result with other studies, including one conducted by Gelbard in 2010, which stated that diabetes mellitus is an independent risk factor for morbidity such as death, infectious complications, cardiovascular disease and post-cholecystectomy renal failure with a p value of 0.034 [5].

According to Abdulkadir's 2001 study, it was reported that the operative complication ratio was 9 cases (4.9%) and postoperative complications amounted to 12 cases (6.5%) higher in patients with diabetes with p values of 0.026 and 0.0061 respectively [2]. It is possible that according to Alves, in 2012 diabetes mellitus was associated with decreased T cell responses, neutrophil function and impaired humoral immunity. Sequentially, diabetes mellitus increases the likelihood of infection. Infection that is exacerbated by diabetes in the patient can cause morbidity such as In this study, there were 36 (24.7%) cases with comorbid hypertension who experienced a prolonged length of stay (length of stay). The results showed that hypertension comorbid factors affected the length of hospitalization days. Other studies that are in line with the results of this study, among others, a study conducted by Shih-Ping Cheng in 2007 said that hypertension is one of the comorbid factors that cause an extension of the length of hospitalization days more than 5 days, whereas many as 28 (60.9%) patients hypertension experienced an extended length of stay ($p<0.001$) [5].

Possibly according to Kiefer, the Renin-Angiotensin-Aldosterone System (RAAS) plays an important role in controlling blood pressure[11,12]. This system is responsible for the pathophysiology of hypertension and target organ damage [13]. Target organ damage includes vascular remodeling, resulting in inhibition of angiogenesis in wound healing through activation of AT2 receptors, which will prolong wound healing time so that the length of hospitalization day will be prolonged [11].

According to Varon and Manik during surgical procedures, patients with or without previous hypertension tend to experience increased blood pressure and tachycardia during induction of anesthesia. So that when going to carry out surgery, the increase in excessive blood pressure must be controlled to normal limits, because it is necessary to treat hypertensive patients first before going to a surgical procedure, so hypertension can affect the length of hospitalization days [14].

The type of surgical procedure also affects the length of treatment days, according to Steven L. Zacks, patients who underwent open cholecystectomy were hospitalized longer than patients who underwent laparoscopic cholecystectomy [15], Hospitalization for more than five days was 48 (32.9%) and only 8 (5.5%) patients underwent hospitalization for less than 5 days. Meanwhile, 53 (36.3%) patients who underwent laparoscopic cholecystectomy were hospitalized within 5 days more than patients who required hospitalization for more than 5 days.

In addition to hypertension, age also plays a role in lengthening the length of stay, according to a study conducted by Sivesh K. Kamarajah, increasing age increases the risk of complications, conversions, postoperative mortality, and lengthening the length of stay [16], but in this study, there was no difference. significant in patients with geriatric status and non-geriatric patients, This is because the sample size of geriatric cases undergoing cholecystectomy is too small, the number of cases is 21 (14.4%).

Research Limitations

This study tracked down various shortcomings and limits, including the low number of samples used in this study, the sample used was 146 cases out of 201 cases of cholelithiasis that qualified inclusion and exclusion criteria of this study, this number is exceptionally little when contrasted with research and existing journal.

Notwithstanding the low example size, this study didn't order patients dependent on the kind of cholecystectomy performed, which may prompt a bias of the outcomes in patients undergoing open cholecystectomy and laparoscopic cholecystectomy.

Conclusion

This study shows that hypertension affects the prolonged length of stay in patients undergoing cholecystectomy.

Confilct of Interest – Nil.

Source of Funding – Self.

Ethical Clearance – Taken from Sub Komite Etik Penelitian Kesehatan Rumkital Dr. Ramelan Surabaya.

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